



Manulife Financial Corporation Management's Discussion & Analysis

For the year ended December 31, 2020

Caution regarding forward-looking statements

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

The forward-looking statements in this document include, but are not limited to, statements with respect to the Company’s strategic priorities and 2022 targets for net promoter score, employee engagement, its highest potential businesses, expense efficiency and portfolio optimization, and our business continuity plans and measures implemented in response to the COVID-19 pandemic and its expected impact on our businesses, operations, earnings and results, and also relate to, among other things, our objectives, goals, strategies, intentions, plans, beliefs, expectations and estimates, and can generally be identified by the use of words such as “may”, “will”, “could”, “should”, “would”, “likely”, “suspect”, “outlook”, “expect”, “intend”, “estimate”, “anticipate”, “believe”, “plan”, “forecast”, “objective”, “seek”, “aim”, “continue”, “goal”, “restore”, “embark” and “endeavour” (or the negative thereof) and words and expressions of similar import, and include statements concerning possible or assumed future results. Although we believe that the expectations reflected in such forward-looking statements are reasonable, such statements involve risks and uncertainties, and undue reliance should not be placed on such statements and they should not be interpreted as confirming market or analysts’ expectations in any way.

Certain material factors or assumptions are applied in making forward-looking statements and actual results may differ materially from those expressed or implied in such statements. Important factors that could cause actual results to differ materially from expectations include but are not limited to: general business and economic conditions (including but not limited to the performance, volatility and correlation of equity markets, interest rates, credit and swap spreads, currency rates, investment losses and defaults, market liquidity and creditworthiness of guarantors, reinsurers and counterparties); the severity, duration and spread of the COVID-19 outbreak, as well as actions that have been, or may be taken by governmental authorities to contain COVID-19 or to treat its impact; changes in laws and regulations; changes in accounting standards applicable in any of the territories in which we operate; changes in regulatory capital requirements; our ability to execute strategic plans and changes to strategic plans; downgrades in our financial strength or credit ratings; our ability to maintain our reputation; impairments of goodwill or intangible assets or the establishment of provisions against future tax assets; the accuracy of estimates relating to morbidity, mortality and policyholder behaviour; the accuracy of other estimates used in applying accounting policies, actuarial methods and embedded value methods; our ability to implement effective hedging strategies and unforeseen consequences arising from such strategies; our ability to source appropriate assets to back our long-dated liabilities; level of competition and consolidation; our ability to market and distribute products through current and future distribution channels; unforeseen liabilities or asset impairments arising from acquisitions and dispositions of businesses; the realization of losses arising from the sale of investments classified as available-for-sale; our liquidity, including the availability of financing to satisfy existing financial liabilities on expected maturity dates when required; obligations to pledge additional collateral; the availability of letters of credit to provide capital management flexibility; accuracy of information received from counterparties and the ability of counterparties to meet their obligations; the availability, affordability and adequacy of reinsurance; legal and regulatory proceedings, including tax audits, tax litigation or similar proceedings; our ability to adapt products and services to the changing market; our ability to attract and retain key executives, employees and agents; the appropriate use and interpretation of complex models or deficiencies in models used; political, legal, operational and other risks associated with our non-North American operations; acquisitions and our ability to complete acquisitions including the availability of equity and debt financing for this purpose; the disruption of or changes to key elements of the Company’s or public infrastructure systems; environmental concerns; our ability to protect our intellectual property and exposure to claims of infringement; and our inability to withdraw cash from subsidiaries.

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

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Management's Discussion and Analysis



This Management's Discussion and Analysis ("MD&A") is current as of February 10, 2021.

1. Manulife Financial Corporation

Manulife Financial Corporation is a leading international financial services group that helps people make their decisions easier and lives better. With our global headquarters in Toronto, Canada, we operate as Manulife across our offices in Canada, Asia, and Europe, and primarily as John Hancock in the United States. We provide financial advice, insurance, and wealth and asset management solutions for individuals, groups and institutions. At the end of 2020, we had more than 37,000 employees, over 118,000 agents, and thousands of distribution partners, serving over 30 million customers. At the end of 2020, we had \$1.3 trillion (US\$1.0 trillion) in assets under management and administration, and during 2020, we made \$31.6 billion in payments to our customers. Our principal operations are in Asia, Canada and the United States where we have served customers for more than 155 years. We trade as 'MFC' on the Toronto, New York, and the Philippine stock exchanges, and under '945' in Hong Kong.

Our reporting segments are:

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

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

Profitability

Profitability

As at and for the years ended December 31,
(\$ millions, unless otherwise stated)

	2020	2019	2018
Net income attributed to shareholders	\$ 5,871	\$ 5,602	\$ 4,800
Core earnings ⁽¹⁾	\$ 5,516	\$ 6,004	\$ 5,610
Diluted earnings per common share (\$)	\$ 2.93	\$ 2.77	\$ 2.33
Diluted core earnings per common share (\$) ⁽¹⁾	\$ 2.75	\$ 2.97	\$ 2.74
Return on common shareholders' equity ("ROE")	11.6%	12.2%	11.6%
Core ROE ⁽¹⁾	10.9%	13.1%	13.7%
Expense efficiency ratio ⁽¹⁾	52.9%	52.0%	52.0%

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

Our net income attributed to shareholders was \$5.9 billion in 2020 compared with \$5.6 billion in 2019. Net income attributed to shareholders is comprised of core earnings¹ (consisting of items we believe reflect the underlying earnings capacity of the business), which amounted to \$5.5 billion in 2020 compared with \$6.0 billion in 2019, and items excluded from core earnings of \$0.4 billion of net gains in 2020 compared with \$0.4 billion of net charges in 2019.

The \$0.3 billion increase in net income attributed to shareholders compared with 2019 was primarily due to gains from the direct impact of interest rates in 2020, including gains from the sale of available-for-sale bonds ("AFS") held in Corporate and Other, (compared with losses in 2019, including a \$0.5 billion charge related to updated Ultimate Reinvestment Rate ("URR") assumptions issued by the Canadian Actuarial Standards Board), partially offset by losses on investment-related experience (compared with gains in 2019, including \$400 million of core investment gains¹) and losses from the direct impact of equity markets and variable annuity guarantee liabilities (compared with gains in 2019).

The \$0.5 billion decrease in core earnings compared with 2019 reflects the absence of core investment gains in the year (compared with gains in the prior year), lower investment income in Corporate and Other, less favourable impact of markets on seed money investments in new segregated and mutual funds, and lower new business volumes. These items were partially offset by the impact of in-force business growth, favourable policyholder experience, favourable new business product mix in Hong Kong and Asia Other², and higher average AUMA in Global Wealth and Asset Management. Core earnings in 2020 included net policyholder experience gains of \$83 million post-tax (\$76 million pre-tax) compared with a net charge of \$17 million post-tax (\$55 million pre-tax) in 2019.³ Actions to improve the capital efficiency of our legacy businesses resulted in \$37 million lower core earnings in 2020 compared with 2019.

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

² Asia Other excludes Hong Kong and Japan.

³ Policyholder experience includes gains of \$60 million post-tax in 2020 (2019 – gains of \$83 million post-tax) from the release of margins on medical policies in Hong Kong that have lapsed for customers who have opted to change their existing policies to the new Voluntary Health Insurance Scheme ("VHIS") products. These gains did not have a material impact on core earnings as they were mostly offset by new business strain.

Core earnings by segment is presented in the following table. See Asia, Canada, U.S., and Global WAM sections below.

For the years ended December 31, (\$ millions)	2020	2019	% change ⁽¹⁾ 2020 vs 2019	2018
Core earnings by segment ^{(1),(2),(3)}				
Asia	\$ 2,110	\$ 2,005	4%	\$ 1,766
Canada	1,174	1,201	(2)%	1,327
U.S.	1,995	1,876	5%	1,789
Global Wealth and Asset Management	1,100	1,021	7%	985
Corporate and Other (excluding core investment gains)	(863)	(499)	(73)%	(657)
Core investment gains ^{(2),(4)}	–	400	(100)%	400
Total core earnings	\$ 5,516	\$ 6,004	(9)%	\$ 5,610

⁽¹⁾ Percentage change is on a constant exchange rate basis. See “Performance and Non-GAAP Measures” below.

⁽²⁾ This item is a non-GAAP measure. See “Performance and Non-GAAP Measures” below.

⁽³⁾ 2018 comparatives for core earnings in each segment have been updated to reflect the 2019 methodology for allocating capital and interest on surplus to our insurance segments from the Corporate and Other segment.

⁽⁴⁾ See note (2) in the table below.

The table below reconciles 2020, 2019 and 2018 net income attributed to shareholders to core earnings and provides further details for each of the items excluded from core earnings.

For the years ended December 31, (\$ millions)	2020	2019	2018
Core earnings⁽¹⁾	\$ 5,516	\$ 6,004	\$ 5,610
Items to reconcile core earnings to net income (loss) attributed to shareholders:			
Investment-related experience outside of core earnings ⁽²⁾	(792)	366	200
Direct impact of equity markets and interest rates and variable annuity guarantee liabilities	932	(778)	(857)
<i>Direct impact of equity markets and variable annuity guarantee liabilities⁽³⁾</i>	(228)	456	(928)
<i>Fixed income reinvestment rates assumed in the valuation of policy liabilities⁽⁴⁾</i>	(1,015)	(1,130)	354
<i>Sale of AFS bonds and derivative positions in the Corporate and Other segment</i>	2,175	396	(283)
<i>Changes to the Ultimate Reinvestment Rate⁽⁵⁾</i>	–	(500)	–
Change in actuarial methods and assumptions ⁽⁶⁾	(198)	(21)	(51)
Reinsurance transactions ⁽⁷⁾	341	81	175
Restructuring charge ⁽⁸⁾	–	–	(263)
Tax-related items and other ⁽⁹⁾	72	(50)	(14)
Total items excluded from core earnings	355	(402)	(810)
Net income attributed to shareholders	\$ 5,871	\$ 5,602	\$ 4,800

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

⁽²⁾ In accordance with our definition of core earnings, we include up to \$400 million of net favourable investment-related experience reported in a single year, as core investment gains (see “Performance and Non-GAAP Measures” below). Items excluded from core earnings include net investment-related experience in excess of \$400 million per annum or net unfavourable investment-related experience on a year-to-date basis. In 2020, the investment-related experience net charge of \$792 million reflected lower-than-expected returns (including fair value changes) on alternative long-duration assets (“ALDA”) primarily driven by investments in oil & gas and real estate, partially offset by the favourable impact of fixed income reinvestment activities. In 2019, investment-related experience net gains of \$766 million were generated, reflecting the favourable impact of fixed income reinvestment activities on the measurement of our policy liabilities, strong returns (including changes in fair value) on ALDA, and strong credit experience.

⁽³⁾ In 2020, the net charge related to equity markets of \$228 million included a charge of \$1,641 million from gross equity exposure and a modest charge of \$7 million from macro hedge experience partially offset by a gain of \$1,420 million from dynamic hedging experience. In 2019, the net gain of \$456 million included a gain of \$443 million from gross equity exposure and a gain of \$45 million from dynamic hedging experience, partially offset by a charge of \$32 million from macro hedge experience.

⁽⁴⁾ In 2020, the charge due to fixed income reinvestment rates of \$1,015 million was primarily due to the reduction in risk-free rates and, to a much lesser extent, lower corporate spreads, with spreads for some tenors and ratings being slightly below their respective 2019 levels. In 2019, the net charge due to fixed income reinvestment rates of \$1,130 million was primarily due to the narrowing of corporate spreads, the impact of lower risk-free rates and a steepening of the yield curve.

⁽⁵⁾ In 2019, the Actuarial Standards Board (“ASB”) issued new assumptions with reductions to the URR and updates to the calibration criteria for stochastic risk-free rates. The updated standard included a reduction of 15 basis points in the URR and a corresponding change to stochastic risk-free rate modeling which resulted in a \$500 million charge. The long-term URR for risk-free rates in Canada is prescribed at 3.05% and we use the same assumption for the U.S. Our assumption for Japan is 1.6%. The ASB is currently conducting another review of the URR with any changes expected to be announced and implemented in 2021.

⁽⁶⁾ See “Critical Actuarial and Accounting Policies – Review of Actuarial Methods and Assumptions” section below for further information on the 2020 and 2019 charges.

⁽⁷⁾ In 2020, reinsurance transactions in the U.S., Asia and Canada contributed gains of \$262 million, \$58 million and \$21 million, respectively. The 2019 net gain of \$81 million included gains resulting from reinsurance transactions primarily related to our legacy businesses in Canada and the U.S.

⁽⁸⁾ The 2018 charge of \$263 million primarily related to the voluntary exit program in our Canadian operation transformation program and to our North American voluntary early retirement program as well as costs to optimize our real estate footprint in the U.S. and Canada.

⁽⁹⁾ In 2020, we reported tax benefits from the U.S. CARES Act, as a result of carrying back net operating losses to prior years, which had higher tax rates. Tax-related items and other charges in 2019 primarily related to a tax rate change in the province of Alberta, Canada.

Diluted earnings per common share was \$2.93 in 2020, compared with \$2.77 in 2019 primarily related to the increase in net income attributed to common shareholders. Diluted core earnings per common share¹ was \$2.75 in 2020, compared with \$2.97 in 2019 primarily related to the decrease in core earnings. The diluted weighted average common shares outstanding was 1,943 million in 2020 and 1,962 million in 2019.

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

Return on common shareholders' equity ("ROE") for 2020 was 11.6%, compared with 12.2% for 2019 and core return on shareholders' equity ("core ROE")¹ was 10.9% in 2020 compared with 13.1% in 2019. The decrease in 2020 core ROE was predominantly driven by an increase in common shareholders' equity, due to the impact of lower interest rates on AFS debt securities.

Expense efficiency ratio¹ was 52.9% for 2020, compared with 52.0% in 2019. The 0.9 percentage point increase in the ratio compared with 2019 was driven by a 7%² decline in 2020 pre-tax core earnings¹, partially offset by a reduction in general expenses included in core earnings ("core general expenses") of 3%.¹ The reduction in core general expenses reflected the results of our efficiency programs, as well as temporary reductions in discretionary and distribution-related expenditures.

Business Performance

Growth metrics

As at and for the years ended December 31,
(\$ millions, unless otherwise stated)

	2020	2019	2018
Asia APE sales	\$ 3,869	\$ 4,278	\$ 4,012
Canada APE sales	1,148	1,057	975
U.S. APE sales	609	702	553
Total APE sales ⁽¹⁾	5,626	6,037	5,540
Asia new business value	1,387	1,595	1,443
Canada new business value	255	237	207
U.S. new business value	160	218	98
Total new business value ⁽¹⁾	1,802	2,050	1,748
Global Wealth and Asset Management gross flows (\$ billions) ⁽¹⁾	130.2	114.2	119.0
Global Wealth and Asset Management net flows (\$ billions) ⁽¹⁾	8.9	(0.9)	1.6
Global Wealth and Asset Management assets under management and administration (\$ billions) ⁽¹⁾	753.6	681.4	608.8
Total assets under management and administration (\$ billions) ⁽¹⁾	1,297.4	1,188.9	1,083.5

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

Annualized premium equivalent ("APE") sales¹ were \$5.6 billion in 2020, a decrease of 8% compared with 2019. In Asia, APE sales decreased 11% compared with 2019 primarily as a result of lower Japan APE sales, which decreased 30% due to accelerated sales of corporate-owned life insurance ("COLI") products in the first quarter of 2019 in advance of a change in tax regulations and the adverse impact of COVID-19. Hong Kong APE sales decreased 10% compared with 2019 driven by the adverse impact of COVID-19 containment measures, and lower sales to mainland Chinese visitors. Asia Other APE sales in 2020 were in-line with 2019, as growth in mainland China and Vietnam was offset by the adverse impact of COVID-19 in other markets. In Canada, APE sales increased 9% compared with 2019, primarily driven by higher large-case group insurance sales, higher sales in our lower risk segregated funds and higher affinity market sales within individual insurance, partially offset by lower retail insurance sales due to the adverse impact of COVID-19. In the U.S., APE sales decreased 14% compared with 2019, as lower international universal life, domestic protection universal life, and variable universal life sales, more than offset higher term life and domestic indexed universal life sales. The decline in U.S. APE sales was driven by higher prior year domestic universal life sales in advance of anticipated regulatory changes, as well as the unfavourable impact of COVID-19.

New business value ("NBV")¹ was \$1.8 billion in 2020, a decrease of 13% compared with 2019. In Asia, NBV of \$1.4 billion was down 14% compared with 2019, driven by lower sales volumes in Hong Kong and Japan and a decline in market interest rates in Hong Kong and Asia Other, partially offset by favourable product mix in Asia Other. In Canada, NBV of \$255 million was up 8% compared with 2019, primarily due to higher margins and higher sales in our insurance businesses. In the U.S., NBV of \$160 million was down 27% compared with 2019 primarily driven by lower sales volumes.

Global WAM gross flows¹ of \$130.2 billion increased \$16.0 billion or 13% compared with 2019, driven by higher gross flows across all geographies. See "Global Wealth and Asset Management" section below for further details.

Global WAM net inflows¹ were \$8.9 billion in 2020, compared with net outflows of \$0.9 billion in 2019. In Asia, net inflows were \$3.9 billion in 2020 compared with net inflows of \$4.8 billion in 2019, reflecting lower retail net flows mainly in mainland China and Hong Kong, partially offset by higher net flows in Indonesia Retail and Hong Kong Retirement. In Canada, net inflows were \$14.6 billion in 2020 compared with net outflows of \$3.6 billion in 2019, driven by improved net inflows in Institutional Asset Management, from the non-recurrence of an \$8.5 billion redemption in 2019 and the funding of a \$6.9 billion mandate from a new client in the second quarter of 2020 ("2Q20"), and in Retirement, from lower plan redemptions and individual withdrawals. In the U.S., net outflows were \$9.6 billion in 2020 compared with net outflows of \$2.0 billion in 2019, driven by a \$5.0 billion redemption of an equity mandate, and the non-recurrence of several large sales in Institutional Asset Management in 2019, as well as higher redemptions in Retirement, mainly due to member withdrawals under the U.S. CARES Act during the year.

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

² Percentage growth / declines in core earnings, core general expenses, pre-tax core earnings, APE sales, gross flows, net flows, NBV, assets under management and administration, assets under management, core EBITDA and Global Wealth and Asset Management revenue are stated on a constant exchange rate basis. Constant exchange rate basis is a non-GAAP measure. See "Performance and Non-GAAP measures" below.

Assets under Management and Administration (“AUMA”)¹

AUMA as at December 31, 2020 was \$1.3 trillion, an increase of 10%, compared with December 31, 2019, primarily due to the favourable impact of markets and net inflows. The Global Wealth and Asset Management portion of AUMA as at December 31, 2020 was \$754 billion, an increase of 12%, compared with December 31, 2019, driven by the favourable impact of markets and net inflows of \$8.9 billion.

Assets under Management and Administration

As at December 31, (\$ millions)	2020	2019	2018
General fund	\$ 410,977	\$ 378,527	\$ 353,664
Segregated funds net assets ⁽¹⁾	367,436	343,108	313,209
Mutual funds, institutional asset management and other ^{(1),(2)}	356,335	321,826	292,200
Total assets under management	1,134,748	1,043,461	959,073
Other assets under administration	162,688	145,397	124,449
Total assets under management and administration	\$ 1,297,436	\$ 1,188,858	\$ 1,083,522

⁽¹⁾ Segregated fund assets, mutual fund assets and other funds are not available to satisfy the liabilities of the Company's general fund.

⁽²⁾ Other funds represent pension funds, pooled funds, endowment funds and other institutional funds managed by the Company on behalf of others.

Revenue

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

In 2020, revenue before realized and unrealized investment gains and losses was \$59.9 billion compared with \$61.4 billion in 2019. The decrease was primarily due to higher ceded premiums in 2020 from the reinsurance of a block of legacy U.S. Bank-Owned Life Insurance (“BOLI”) business partially offset by higher investment income.

In 2020, the net realized and unrealized investment gains on assets supporting insurance and investment contract liabilities and on the macro hedging program were \$19.0 billion compared with gains of \$18.2 billion for 2019. The 2020 and 2019 gains were primarily due to a decrease in interest rates and higher equity markets.

See “Impact of Fair Value Accounting” below.

Revenue

For the years ended December 31, (\$ millions)	2020	2019	2018
Gross premiums	\$ 41,408	\$ 41,059	\$ 39,150
Premiums ceded to reinsurers	(8,491)	(5,481)	(15,138)
Net premium income	32,917	35,578	24,012
Investment income	16,433	15,393	13,560
Other revenue	10,591	10,399	10,428
Revenue before realized and unrealized investment gains and losses	59,941	61,370	48,000
Realized and unrealized investment gains and losses on assets supporting insurance and investment contract liabilities and on the macro hedge program	18,967	18,200	(9,028)
Total revenue	\$ 78,908	\$ 79,570	\$ 38,972

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

Financial Strength

Financial strength metrics

As at and for the years ended December 31,
(\$ millions, unless otherwise stated)

	2020	2019	2018
MLI's LICAT total ratio ⁽¹⁾	149%	140%	143%
Financial leverage ratio	26.6%	25.1%	28.6%
Consolidated capital ⁽¹⁾	\$ 61,064	\$ 57,369	\$ 56,010
Book value per common share (\$)	\$ 25.00	\$ 23.25	\$ 21.38
Book value per common share excluding accumulated other comprehensive income ("AOCI") (\$)	\$ 21.74	\$ 19.94	\$ 18.23

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

The Life Insurance Capital Adequacy Test ("LICAT") total ratio for MLI was 149% as at December 31, 2020, compared with 140% as at December 31, 2019. The nine percentage point increase from December 31, 2019 was driven by market movements primarily from lower risk-free interest rates, by net capital issuances¹, and by the reinsurance of a block of legacy U.S. BOLI business, partly offset by several smaller items.

MFC's financial leverage ratio increased to 26.6% as at December 31, 2020 from 25.1% as at December 31, 2019, driven by the impact of net issuance of \$2.4 billion of securities, partially offset by the growth in retained earnings.

Consolidated capital² was \$61.1 billion as at December 31, 2020 compared with \$57.4 billion as at December 31, 2019, an increase of \$3.7 billion. The increase was primarily driven by growth in retained earnings of \$3.4 billion, net capital issuances of \$0.7 billion, which does not include MFC senior debt as it does not qualify as regulatory capital,³ and an increase in unrealized gains of AFS debt securities of \$0.4 billion, partially offset by a reduction in participating policyholders' equity of \$0.5 billion and the impact of a stronger Canadian dollar of \$0.4 billion.

Book value per common share as at December 31, 2020 was \$25.00, an increase of 8% compared with \$23.25 as at December 31, 2019, and the book value per common share excluding accumulated other comprehensive income ("AOCI") was \$21.74 as at December 31, 2020, an increase of 9% compared with \$19.94 as at December 31, 2019. The increase in the book value per common share was primarily driven by net income attributed to shareholders net of dividends and a net increase in AOCI. The number of common shares outstanding was 1,940 million as at December 31, 2020 and 1,949 million as at December 31, 2019.

Impact of Fair Value Accounting

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

We reported \$19.0 billion of net realized and unrealized investment gains in investment income in 2020 (2019 – gains of \$18.2 billion).

As outlined under "Critical Actuarial and Accounting Policies" below, net insurance contract liabilities under IFRS are determined using Canadian Asset Liability Method ("CALM"), as required by the Canadian Institute of Actuaries ("CIA"). The measurement of policy liabilities includes the estimated value of future policyholder benefits and settlement obligations to be paid over the term remaining on in-force policies, including the costs of servicing the policies, reduced by the future expected policy revenues and future expected investment income on assets supporting the policies. Investment returns are projected using the current asset portfolios and projected reinvestment strategies. Experience gains and losses are reported when current period activity differs from what was assumed in the policy liabilities at the beginning of the period. We classify gains and losses by assumption type. For example, current period investing activities that increase (decrease) the future expected investment income on assets supporting the policies will result in an investment-related experience gain (loss). See description of investment-related experience in "Performance and Non-GAAP Measures" below.

Public Equity Risk and Interest Rate Risk

At December 31, 2020, excluding impacts from asset-based fees earned on assets under management and policyholder account value, the impact of a 10% decline in equity markets was estimated to be a charge of \$610 million and the impact of a 50 basis point decline in interest rates, across all durations and markets, on our earnings was estimated to be neutral. See "Risk Factors and Risk Management" below.

Impact of Foreign Exchange Rates

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

¹ LICAT reflects capital redemptions once the intention to redeem has been announced. As a result, the December 31, 2020 LICAT ratio reflects the impact of the \$350 million of MLI subordinated debentures redeemed in January 2021 (announced in November 2020).

² This item is a non-GAAP measure. See "Performance and Non-GAAP Measures" below.

³ Consolidated capital does not include MFC senior debt (net issuance of \$1.7 billion in 2020) as this form of financing does not meet OSFI's definition of regulatory capital at the MFC level. The Company has down-streamed the proceeds from this financing into operating entities in a form that qualifies as regulatory capital at the subsidiary level.

Items impacting our Consolidated Statements of Income are translated to Canadian dollars using average exchange rates for the respective quarterly period. For items impacting our Consolidated Statements of Financial Position, period end rates are used for currency translation purpose. The following table provides the most relevant foreign exchange rates for 2020 and 2019.

Exchange rate	Quarterly					Full Year	
	4Q20	3Q20	2Q20	1Q20	4Q19	2020	2019
Average ⁽¹⁾							
U.S. dollar	1.3030	1.3321	1.3854	1.3449	1.3200	1.3414	1.3269
Japanese yen	0.0125	0.0126	0.0129	0.0124	0.0122	0.0126	0.0122
Hong Kong dollar	0.1681	0.1719	0.1787	0.1731	0.1687	0.1729	0.1693
Period end							
U.S. dollar	1.2732	1.3339	1.3628	1.4187	1.2988	1.2732	1.2988
Japanese yen	0.0124	0.0126	0.0126	0.0131	0.0120	0.0124	0.0120
Hong Kong dollar	0.1642	0.1721	0.1758	0.1830	0.1668	0.1642	0.1668

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




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

Changes in foreign exchange rates, primarily due to the weakening of the Canadian dollar compared with the U.S. dollar, increased core earnings by approximately \$60 million in 2020 compared with 2019. The impact of foreign currency on items excluded from core earnings does not provide relevant information given the nature of these items.

Strategic priorities progress update

Strategy

Our ambition is to be the most digital, customer-centric global company in our industry. These are our goals for our three important stakeholder groups:

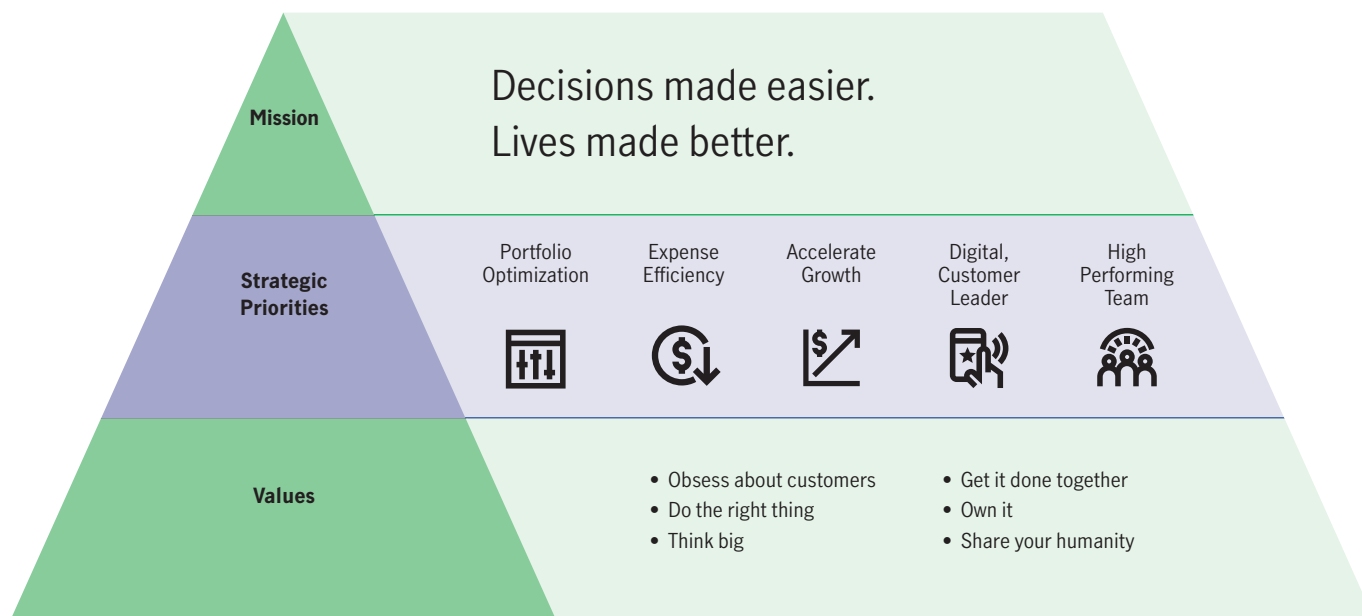
-  **Customers**
Improve Net Promoter Score by +30 points and delight customers¹
-  **Employees**
Engage our employees — achieve top quartile engagement²
-  **Shareholders**
Deliver top quartile returns³

¹ As compared to a baseline of +1 in 2017.

² Top quartile employee engagement compared to global financial services companies and insurance peers by 2022.

³ Top quartile shareholder returns compared to our peer group.

Our mission, strategic priorities and values are summarized below:



Strategic Priorities

Our strategy is underpinned by five strategic priorities that were introduced in June 2018. These priorities drive our focus as we strive to be the most digital, customer-centric global company in our industry.

Portfolio Optimization – We are continually optimizing our portfolio and have already surpassed our original target to release \$5 billion of capital by 2022, delivering \$5.9 billion of cumulative capital benefits through 2020. In 2020, we broadened the portfolio optimization priority to include all of our global in-force insurance and annuity management. Focal areas within this pillar are to:

- Deliver capital release from legacy businesses, including legacy annuity businesses, long-term care insurance and select long-duration, guaranteed insurance products.
- Optimize our portfolio in order to improve our risk profile
- Optimize our portfolio in order to improve our Return on Equity
- Create tangible value through in-force management initiatives

Expense Efficiency – We are focused on driving efficient growth, targeting a less than 50% expense efficiency ratio and have already delivered on our original target of \$1 billion in expense efficiencies. Focal areas within this pillar are to:

- Leverage our global scale and operating environment
- Streamline business processes
- Eliminate activity not valued by our end customers
- Continue to sustain a culture of expense efficiency and driving efficient growth

Accelerate Growth – Our growth ambition seeks to generate two-thirds of core earnings from our high potential businesses. Focal areas within this pillar are to:

- Execute on organic and inorganic growth opportunities in Asia
- Execute on organic and inorganic growth opportunities in Global Wealth and Asset Management
- Expand our behavioural insurance offering to provide innovative solutions and support positive health in our customer base
- Drive new business growth through group insurance

Digital, Customer Leader – In line with our mission to become the most digital, customer-centric global company in our industry, we aim to improve Net Promoter Score by 30 points. Focal areas within this pillar are to:




- Invest in digital assets to improve customer experience
- Deploy a globally consistent NPS system
- Utilize a human-centered design approach for the development of new products and services
- Leverage global agile capabilities to drive improvements in our ways of working

High Performing Team – We are committed to enabling a high performing team and achieving top quartile employee engagement. Focal areas within this pillar are to:

- Drive organizational effectiveness and speed of decision making
- Deepen Manulife's diversity and inclusion
- Develop our talent with differentiated capabilities
- Leverage a global recognition program to reward excellence and promote company values

Progress Update



Manulife's mission – Decisions made easier. Lives made better – guided our business throughout 2020. Our focused efforts produced solid results on our five strategic priorities as noted below.

Strategic priorities	2022 Targets ¹	2020 Performance	Highlights on our progress
1. Portfolio Optimization 	<ul style="list-style-type: none"> • Release a total of \$5 billion in capital from legacy businesses 	<ul style="list-style-type: none"> • Achieved 3 years ahead of schedule • Delivered \$5.9 billion of cumulative capital benefits, including \$0.8 billion in 2020 	<ul style="list-style-type: none"> • \$3.6 billion from reinsurance and other actions in our North American Legacy businesses including \$0.5 billion from reinsuring a block of legacy U.S. BOLI business in 2020 • \$2.3 billion from a reduction in the allocation to ALDA in the portfolio asset mix supporting legacy business
2. Expense Efficiency 	<ul style="list-style-type: none"> • Achieve a less than 50% expense efficiency ratio • Deliver \$1 billion in expense efficiencies 	<ul style="list-style-type: none"> • Expense efficiency ratio of 52.9% in 2020, compared to 52.0% in 2019 • Cumulative expense efficiencies of \$1.0 billion in pre-tax annual savings, achieved 2 years ahead of schedule, including over \$300 million of sustainable savings in 2020 	<ul style="list-style-type: none"> • The maturity of our expense efficiency program has played a crucial role throughout the economic downturn and enabled us to be responsive to headwinds. • Core general expenses declined by 3% in 2020 compared to 2019 • Consolidated our real estate footprint • Implemented automation, robotic solutions, and leveraged artificial intelligence to adjudicate less complex transactions • Renegotiated various contracts with third-party vendors • Despite headwinds related to the global pandemic, we are on track to achieve our target expense efficiency ratio of less than 50% by 2022.¹
3. Accelerate Growth 	<ul style="list-style-type: none"> • Generate two-thirds of core earnings from highest potential businesses² 	<ul style="list-style-type: none"> • 66% of our core earnings in 2020 were generated from highest potential businesses, compared to 57% in 2019 	<ul style="list-style-type: none"> • Continued our expansion in bancassurance with an exclusive 16-year partnership with VietinBank³ to better meet the growing financial and insurance needs of the Vietnamese people and an extension of our agreement with PT Bank Danamon Indonesia to 2036 • Continued our expansion of behavioural-based wellness insurance products through our Manulife Vitality program in Canada, "Vitality for All" strategy in the U.S. and ManulifeMOVE in Asia • Solidified our position as the largest MPF scheme sponsor in Hong Kong through strategic alliance with Allianz Global Investors, expected to close in 2021¹ • Experienced 7% growth in Global WAM core earnings increasing to 20% of total core earnings in 2020 • Normalizing for the absence of core investment gains in the denominator, our highest potential businesses would have contributed 62% of core earnings, which is a 5 percentage point increase versus 2019

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

² Asia, Global WAM, group insurance in Canada, and behavioural insurance products.

³ Subject to regulatory approval.

Strategic priorities	2022 Targets ¹	2020 Performance	Highlights on our progress
4. Digital, Customer Leader 	<ul style="list-style-type: none"> Improve Net Promoter Score by 30 points, as compared to a baseline of +1 in 2017 	<ul style="list-style-type: none"> rNPS² score of +12, an 11 point improvement from the 2017 baseline and a 4 point improvement from 2019 2020 scores remain competitive with global benchmarks 	<ul style="list-style-type: none"> 2020 was a challenging year for many people and in order to make things easier and safer for customers, we responded to the pandemic by reorienting customer experiences through the enhancement and acceleration of our digital capabilities Launched a new, fully underwritten term life product in the U.S. which enables customers to purchase up to US\$1 million in life insurance coverage digitally Launched a new retirement planner tool in our Global WAM U.S. business to deliver an innovative and engaging way for customers to visualize and plan for their retirement Introduced facial and video recognition, and intelligent guide script into the sales process in mainland China Expanded our partnership with Akira Health to provide a broader range of online medical services to insurance customers in Canada Vast majority of our products are available to prospective customers through virtual face-to-face methods³: 97% of APE sales in both Asia and Canada⁴, 80% of APE sales in the U.S.⁴ and 90% of Global WAM AUMA⁵
5. High Performing Team 	<ul style="list-style-type: none"> Achieve top quartile employee engagement compared to global financial services and insurance peers 	<ul style="list-style-type: none"> Ranked in the top quartile amongst our designated peer group on employee engagement in 2020 	<ul style="list-style-type: none"> Ranked in the 80th percentile amongst global financial services and insurance peers on our 2020 employee engagement survey Named a World's Best Employer by Forbes, ranked in the top 100 best employers globally Committed to invest more than \$3.5 million over the next two years to promote diversity, equity and inclusion in our workplace and communities we serve.

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

² Relationship Net Promoter Score ("rNPS").

³ Virtual face-to-face, includes digital as well as non-digital solutions.

⁴ Represents the percentage of 2019 APE sales that are currently available for sale via virtual face-to-face methods (applies to Asia, Canada and U.S.).

⁵ Reflects Global WAM's AUMA available to new and existing retail and retirement customers.

2. Asia

Our Asia segment is a leading provider of insurance products and insurance-based wealth accumulation products, driven by a customer-centric strategy and leveraging the asset management expertise and products managed by our Global Wealth and Asset Management segment. Present in many of Asia's largest and fastest growing economies, we are well positioned to capitalize on the attractive underlying demographics of the region, underpinned by a rigorous focus on creating value for our customers, employees and shareholders.

We have insurance operations in 11 markets¹: Japan, Hong Kong, Macau, Singapore, mainland China, Vietnam, Indonesia, the Philippines, Malaysia and Cambodia, and have recently started operations in Myanmar.

We have a diversified multi-channel distribution network, including over 115,000 contracted agents and over 100 bank partnerships. We also work with many independent agents, financial advisors and brokers. Among our bancassurance partnerships we have nine exclusive partnerships, including a long-term partnership with DBS Bank across Singapore, Hong Kong, mainland China and Indonesia, that give us access to over 16 million bank customers.

In 2020, Asia contributed 33% of the Company's core earnings from operating segments and, as at December 31, 2020, accounted for 11% of the Company's assets under management and administration.

Profitability

Asia reported net income attributed to shareholders of \$1,762 million in 2020 compared with \$1,935 million in 2019. Net income attributed to shareholders is comprised of core earnings, which was \$2,110 million in 2020 compared with \$2,005 million in 2019, and items excluded from core earnings, which amounted to a net charge of \$348 million for 2020 compared with a net charge of \$70 million in 2019.

Expressed in U.S. dollars, the presentation currency of the segment, net income attributed to shareholders was US\$1,322 million in 2020 compared with US\$1,457 million in 2019 and core earnings were US\$1,576 million in 2020 compared with US\$1,511 million in 2019. Items excluded from core earnings are outlined in the table below and amounted to a net charge of US\$254 million in 2020 and a net charge of US\$54 million in 2019.

Core earnings in 2020 increased 4% compared with 2019, after adjusting for the impact of changes in foreign currency exchange rates. Core earnings increased by 10% in Hong Kong and 8% in Asia Other and declined by 18% in Japan. Hong Kong and Asia Other core earnings benefited from in-force business growth, favourable new business product mix, and improved policyholder experience, partially offset by lower new business volumes in Hong Kong. Japan core earnings were impacted by lower new business volumes partially offset by in-force business growth and favourable policyholder experience.

The table below reconciles net income attributed to shareholders to core earnings for Asia for 2020, 2019 and 2018.

For the years ended December 31, (\$ millions)	Canadian \$			US \$		
	2020	2019	2018	2020	2019	2018
Core earnings^{(1),(2)}	\$ 2,110	\$ 2,005	\$ 1,766	\$ 1,576	\$ 1,511	\$ 1,363
Items to reconcile core earnings to net income attributed to shareholders:						
Investment-related experience related to fixed income trading, market value increases in excess of expected alternative assets investment returns, asset mix changes and credit experience	218	195	284	167	147	219
Direct impact of equity markets and interest rates and variable annuity guarantee liabilities ⁽³⁾	(583)	(258)	(375)	(433)	(196)	(287)
Change in actuarial methods and assumptions	(41)	(7)	27	(32)	(5)	21
Reinsurance transactions	58	–	5	44	–	4
Other	–	–	(3)	–	–	(3)
Net income attributed to shareholders⁽²⁾	\$ 1,762	\$ 1,935	\$ 1,704	\$ 1,322	\$ 1,457	\$ 1,317

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

⁽²⁾ 2018 comparatives for core earnings and net income attributed to shareholders have been updated to reflect the 2019 methodology for allocating capital and interest on surplus to our insurance segments from the Corporate and Other segment.

⁽³⁾ The direct impact of markets in 2020 was a charge of US\$433 million and included a charge of US\$415 million related to fixed income reinvestment rates and a charge of US\$18 million related to equity markets and variable annuity guarantee liabilities. The charge in 2019 primarily related to the impact of fixed income reinvestment rates and the URR partially offset by a gain related to equity markets.

Business Performance

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

Annualized premium equivalent ("APE") sales in 2020 were US\$2,892 million, representing a decrease of 11% compared with 2019. APE sales were lower in Japan and Hong Kong and consistent with 2019 in Asia Other. In Japan, APE sales in 2020 were US\$600 million, a

¹ In 2019, we made the decision to exit Thailand, and have reached an agreement to sell the operation. Regulatory approval has been obtained and we expect to complete the transaction in the first half of 2021.

decrease of 30% compared with 2019 due to accelerated sales of COLI products in the first quarter of 2019 in advance of a change in tax regulations and the adverse impact of COVID-19. Hong Kong APE sales in 2020 were US\$773 million, a decrease of 10% compared with 2019, driven by the adverse impact of COVID-19 and a decrease in sales to mainland Chinese visitors. Asia Other APE sales in 2020 of US\$1,519 million were in-line with 2019 as growth in Vietnam and mainland China was fully offset by the adverse impact of COVID-19 on sales in the other markets.

New business value (“NBV”) was US\$1,037 million in 2020, a decrease of 14% compared with 2019. We experienced lower NBV in Japan and Hong Kong, partially offset by higher NBV in Asia Other. In Japan, NBV in 2020 was US\$131 million, a decrease of 50% compared with 2019 due to lower APE sales and a higher COLI mix. In Hong Kong, NBV in 2020 was US\$463 million, a decrease of 14% compared with 2019 driven by lower sales and a decline in market interest rates. Asia Other NBV in 2020 was US\$443 million, an increase of 9% compared to 2019, primarily as a result of favourable product mix, partially offset by a decline in market interest rates. The new business value margin (“NBV margin”)¹ was 38.8% in 2020, a decrease of 1.0 percentage point compared with 2019.

APE Sales and NBV

For the years ended December 31, (\$ millions)	Canadian \$			US \$		
	2020	2019	2018	2020	2019	2018
Annualized premium equivalent sales ⁽¹⁾	\$ 3,869	\$ 4,278	\$ 4,012	\$ 2,892	\$ 3,224	\$ 3,094
New business value ⁽¹⁾	1,387	1,595	1,443	1,037	1,202	1,112

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

Assets under Management¹

Asia’s assets under management were US\$108.7 billion as at December 31, 2020, an increase of US\$15.2 billion or 13% compared with December 31, 2019, driven by net customer inflows of US\$9.9 billion and market growth during 2020.

Assets under Management⁽¹⁾

As at December 31, (\$ millions)	Canadian \$			US \$		
	2020	2019	2018	2020	2019	2018
General fund ⁽²⁾	\$ 115,430	\$ 100,418	\$ 88,776	\$ 90,639	\$ 77,304	\$ 65,075
Segregated funds	22,948	20,968	19,333	18,015	16,138	14,176
Total assets under management	\$ 138,378	\$ 121,386	\$ 108,109	\$ 108,654	\$ 93,442	\$ 79,251

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

⁽²⁾ The 2018 comparative for general fund assets under management has been updated to reflect the 2019 methodology for allocating capital and interest on surplus to our insurance segments from the Corporate and Other segment.

Revenue

Total revenue of US\$21.2 billion in 2020 decreased US\$0.4 billion compared with 2019. Revenue before net realized and unrealized investment gains and losses increased US\$0.5 billion compared with 2019 due to an increase in net premium income and higher investment income. The net premium income increase was primarily driven by the growth of in-force business, partly offset by a decline in new business.

Revenue

For the years ended December 31, (\$ millions)	Canadian \$			US \$		
	2020	2019	2018	2020	2019	2018
Gross premiums	\$ 21,592	\$ 20,724	\$ 18,768	\$ 16,129	\$ 15,620	\$ 14,483
Premiums ceded to reinsurers	(1,113)	(717)	(656)	(834)	(540)	(507)
Net premium income	20,479	20,007	18,112	15,295	15,080	13,976
Investment income ⁽¹⁾	2,874	2,570	2,355	2,145	1,938	1,817
Other revenue	1,346	1,215	1,296	1,004	917	1,000
Revenue before net realized and unrealized investment gains and losses	24,699	23,792	21,763	18,444	17,935	16,793
Net realized and unrealized investment gains and losses ⁽²⁾	3,756	4,881	(2,053)	2,783	3,670	(1,599)
Total revenue	\$ 28,455	\$ 28,673	\$ 19,710	\$ 21,227	\$ 21,605	\$ 15,194

⁽¹⁾ The 2018 comparative for investment income has been updated to reflect the 2019 methodology for allocating capital and interest on surplus to our insurance segments from the Corporate and Other segment.

⁽²⁾ See “Financial Performance – Impact of Fair Value Accounting” above.

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

Strategic Highlights

Asia continues to be a core driver of growth for Manulife, supported by a clear strategy, a focus on execution, a strong team, and a diversified footprint in 11 markets with a compelling economic backdrop. We operate in many of the fastest growing markets in the world, and middle-class emergence, combined with an estimated doubling of household wealth in Asia from 2015 to 2025, will continue to drive demand for financial solutions.

We continued to accelerate our growth by expanding our distribution reach and we implemented several changes to enhance customer experience. In 2020, we:

- Increased the number of agents by 21% to over 115,000. Our active number of agents grew by 14% year-on-year. We now have 6,400 Million Dollar Round Table agents compared with 3,700 in 2019;
- Continued our expansion in bancassurance with the signing of an agreement with VietinBank¹ to establish an exclusive 16-year bancassurance partnership to better meet the growing financial and insurance needs of the Vietnamese people. Our nine exclusive bancassurance partnerships, including a major pan-Asia partnership with DBS Bank, give us access to over 16 million bank customers;
- Extended our strategic bancassurance arrangement with PT Bank Danamon Indonesia Tbk in the first quarter of 2020. The new agreement extends the term covered in the original agreement to 2036;
- Grew our customer base to more than 12 million customers and saw positive momentum in rNPS. We sold our first policy in Myanmar, a digitally savvy market with one of the lowest insurance penetration rates in Asia; and
- Received approval from China Banking and Insurance Regulatory Commission to begin preparation work to establish a new branch in Shaanxi Province.

We continued to enhance our digital capabilities and rolled out a number of key customer initiatives and advanced our digital strategy. In 2020, we:

- Expanded our distribution capabilities, with approximately 97%² of our product shelf now accessible to customers through virtual face-to-face methods³;
- Expanded the deployment of e-claims to Malaysia, Philippines and Cambodia;
- Collaborated with Dacadoo, a Swiss-based global digital health platform provider to strengthen our existing health engagement platform, ManulifeMOVE. This initiative will enable customers to more easily understand their health and be guided to develop healthier habits. We ended 2020 with over 1,000,000 policyholders enrolled in ManulifeMOVE, almost doubling the number of policyholders enrolled at the end of 2019; and
- Entered into a partnership with Cong Dong Bau, a community with more than 5 million members that improves access to financial advice and solutions for expectant and new mothers.

We made progress on building our high performing team. Our overall employee engagement score improved, contributing to the year-on-year improvement for the wider group. We continue to develop our talent and secured executives in key leadership roles by appointing an emerging market General Manager and a regional Chief Marketing Officer.

¹ Pending regulatory approval; not included in the nine exclusive bank arrangements, which includes bancassurance partnership with UAB that received regulatory approval in January 2021.

² This represents the percentage of 2019 APE sales that are currently available for sale via virtual face-to-face methods.

³ Virtual face-to-face, includes digital as well as non-digital solutions.

3. Canada

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

We offer financial protection solutions to individuals, families and business owners through a combination of competitive products, professional advice and quality customer service. We provide group life, health and disability insurance solutions to Canadian employers, with approximately 24,000 Canadian businesses and organizations entrusting their employee benefit programs to Manulife's Group Insurance. We also provide life, health and specialty products, such as mortgage creditor and travel insurance, through advisors, sponsor groups and associations, as well as direct-to-customer. We continue to increase the proportion of products with behavioural insurance features.

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

In 2020, Canada contributed 19% of the Company's core earnings from operating segments and, as at December 31, 2020, accounted for 12% of the Company's assets under management and administration.

Profitability

Canada's full year 2020 net income attributed to shareholders was \$195 million compared with \$1,122 million in 2019. Net income attributed to shareholders is comprised of core earnings, which was \$1,174 million in 2020 compared with \$1,201 million in 2019, and items excluded from core earnings, which amounted to a net charge of \$979 million for 2020 compared with a net charge of \$79 million in 2019. Items excluded from core earnings are outlined in the table below.

The \$27 million or 2% decrease in core earnings was driven by the unfavourable impact of travel claims, lower retail sales in our individual insurance business, the non-recurrence of gains from the second phase of our segregated fund transfer program in 2019 and a number of smaller experience-related items, partially offset by favourable policyholder experience in both group and individual insurance.

The table below reconciles net income attributed to shareholders to core earnings for Canada for 2020, 2019 and 2018.

For the years ended December 31, (\$ millions)	2020	2019	2018
Core earnings^{(1),(2)}	\$ 1,174	\$ 1,201	\$ 1,327
Items to reconcile core earnings to net income attributed to shareholders:			
Investment-related experience related to fixed income trading, market value increases in excess of expected alternative assets investment returns, asset mix changes and credit experience	(260)	477	240
Direct impact of equity markets and interest rates and variable annuity guarantee liabilities ⁽³⁾	(817)	(414)	(307)
Change in actuarial methods and assumptions	77	(108)	(370)
Charge related to decision to change portfolio asset mix supporting our legacy businesses	-	-	-
Reinsurance transactions	21	(30)	102
Tax-related items and other ⁽⁴⁾	-	(4)	(10)
Net income attributed to shareholders⁽²⁾	\$ 195	\$ 1,122	\$ 982

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

⁽²⁾ 2018 comparatives for core earnings and net income attributed to shareholders have been updated to reflect the 2019 methodology for allocating capital and interest on surplus to our insurance segments from the Corporate and Other segment.

⁽³⁾ The direct impact of markets in 2020 was a charge of \$817 million and included a charge of \$708 million related to fixed income reinvestment rates and a charge of \$109 million related to the direct impact of equity markets and variable annuity guarantee liabilities. The charge in 2019 included charges related to fixed income reinvestment rates including a charge related to changes in the URR and were partially offset by the direct impact of equity markets and variable annuity guarantee liabilities.

⁽⁴⁾ The 2019 charge of \$4 million relates to the impact of tax rate changes in the province of Alberta, Canada.

Business Performance

APE sales were \$1,148 million in 2020, an increase of \$91 million or 9% compared with 2019. Individual insurance APE sales in 2020 of \$409 million increased \$13 million or 3% compared with 2019, driven by higher affinity market sales, partially offset by lower retail sales due to the adverse impact of COVID-19. Group insurance APE sales of \$493 million in 2020 increased \$44 million or 10% compared with 2019 due to higher large-case sales, partially offset by lower small and mid-size business sales. Annuities APE sales in 2020 of \$246 million increased \$34 million or 16% compared with 2019 due to higher sales of our lower risk segregated fund products.

Sales

For the years ended December 31, (\$ millions)	2020	2019	2018
APE sales⁽¹⁾	\$ 1,148	\$ 1,057	\$ 975

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

Manulife Bank average net lending assets were \$22.5 billion in 2020, up \$0.6 billion or 3% compared with 2019.

Assets under Management

Assets under management of \$159.3 billion as at December 31, 2020 increased by \$8.0 billion or 5% from \$151.3 billion at December 31, 2019, due to the impact of lower interest rates on asset values.

Assets under Management⁽¹⁾

As at December 31,
(\$ millions)

	2020	2019	2018
General fund ⁽²⁾	\$ 121,657	\$ 115,613	\$ 108,607
Segregated funds	37,650	35,645	33,306
Total assets under management	\$ 159,307	\$ 151,258	\$ 141,913

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

⁽²⁾ The 2018 comparative for general fund assets under management has been updated to reflect the 2019 methodology for allocating capital and interest on surplus to our insurance segments from the Corporate and Other segment.

Revenue

Total revenue of \$18.6 billion in 2020 decreased \$1.0 billion from \$19.6 billion in 2019. Revenue before net realized and unrealized investment gains and losses of \$13.9 billion in 2020 decreased \$0.9 billion from \$14.8 billion in 2019 due to lower investment income as a result of declines in oil and gas prices in the first quarter of 2020 ("1Q20") and the impact of lower interest rates.

Revenue

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

	2020	2019	2018
Gross premiums	\$ 10,756	\$ 10,667	\$ 10,974
Premiums ceded to reinsurers	(1,589)	(1,592)	(1,547)
Net premium income	9,167	9,075	9,427
Investment income ⁽¹⁾	3,711	4,597	4,119
Other revenue	1,013	1,088	1,446
Revenue before net realized and unrealized investment gains and losses	13,891	14,760	14,992
Net realized and unrealized investment gains and losses ⁽²⁾	4,747	4,849	(1,394)
Total revenue	\$ 18,638	\$ 19,609	\$ 13,598

⁽¹⁾ The 2018 comparative for investment income has been updated to reflect the 2019 methodology for allocating capital and interest on surplus to our insurance segments from the Corporate and Other segment.

⁽²⁾ See "Financial Performance – Impact of Fair Value Accounting" above.

Strategic Highlights

In 2020, we took actions to protect the health and well-being of our customers. We have made important progress in advancing our digital capabilities to interact with customers in new and different ways and simplify our processes to make our products more accessible. We continued to modernize our business by developing innovative product solutions and continuing to build a customer-centric digital platform. We continued to successfully execute on our expense reduction strategy to strengthen financial results and improve the risk-return profile in our home market. Our Canada segment remains focused on building and fostering holistic long-lasting relationships with our clients by expanding and integrating our insurance, insurance-based wealth accumulation and banking solutions to meet customers' needs and by leveraging the strength of our group franchise.

We continued to grow our business by developing innovative product solutions and modernizing our delivery process. In 2020, we:

- Enhanced our Group Benefits product offering with the introduction of Health by Design, a proactive approach using the latest science, technology and predictive analytics to help our members with their unique health journey;
- Released a new Return to Work Playbook incorporating physical and mental health and safety guidance to support our Group Benefits clients as they return to their workplaces;
- Continued to see growth in our group insurance Vitality program, the first evidence-rich program of its kind in Canada, designed to encourage participants to make healthy choices using proven behavioural science;
- Enhanced our product offerings and provided relief for our customers since the onset of the pandemic, including a temporary extension of emergency out-of-country coverage for our group and individual customers who experienced travel delays; and
- Introduced flexible financial solutions to support our banking clients, such as deferrals and relief programs for residential and commercial mortgages, loans and credit cards.

We have executed on a number of initiatives to expand our digital capabilities focused on non-face-to-face product accessibility and personalized customer service. In 2020, we:

- Continued to focus on acceleration of our digital capabilities to improve the client experience, with approximately 97%¹ of our product shelf accessible to customers through virtual face-to-face methods²;
- Expanded our partnership with Akira Health to provide a broader range of online medical services to our insurance clients to better support their health and wellness;
- Continued to advance a number of new group insurance digital platforms to simplify the enrolment experience, claims submission and processing as well as communication with group insurance members;
- Introduced a new mortgage creditor tool becoming the first mortgage insurance provider to offer an online mortgage insurance application; and
- Received a Gold dotcom international award for the redesign of manulifebank.ca and launched a refreshed user experience with personalized insights in our top-rated iOS and Android app for Manulife Bank customers.

¹ Represents the percentage of 2019 APE sales that are currently available for sale via virtual face-to-face methods.

² Virtual face-to-face, includes digital as well as non-digital solutions.

4. U.S.

Our U.S. segment provides a range of life insurance products, insurance-based wealth accumulation products, and has an in-force long-term care insurance business and an in-force annuity business.

The insurance products we offer are designed to provide estate, business and income-protection solutions for high net worth, emerging affluent markets and the middle market, and to leverage the asset management expertise and products managed by our Global Wealth and Asset Management business. Behavioural insurance features are standard on all our new insurance product offerings. The primary distribution channel is licenced financial advisors. We aim to establish lifelong customer relationships that benefit from our holistic protection and wealth product offerings in the future.

Our in-force long-term care insurance policies provide coverage for the cost of long-term services and support.

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

In 2020, U.S. contributed 31% of the Company's core earnings from operating segments and, as at December 31, 2020, accounted for 18% of the Company's assets under management and administration.

Profitability

U.S. reported net income attributed to shareholders of \$1,269 million in 2020 compared with \$1,428 million in 2019. Net income attributed to shareholders is comprised of core earnings, which was \$1,995 million in 2020 compared with \$1,876 million in 2019, and items excluded from core earnings, which amounted to a net charge of \$726 million in 2020 compared with a net charge of \$448 million in 2019.

Expressed in U.S. dollars, the functional currency of the segment, 2020 net income attributed to shareholders was US\$987 million compared with US\$1,074 million in 2019 and core earnings were US\$1,485 million in 2020 compared with US\$1,414 million in 2019. Items excluded from core earnings are outlined in the table below and amounted to a net charge of US\$498 million in 2020 compared with a net charge of US\$340 million in 2019.

The US\$71 million increase in core earnings was driven by higher in-force earnings and a focus on reduced spending in the current economic environment, partially offset by the non-recurrence of a favourable true-up of prior year tax provisions in 2019. Insurance policyholder experience was consistent with the prior year, as unfavourable life insurance experience, which included COVID-19 related claim losses, was offset by favourable long-term care experience resulting from claim terminations due to the impact of COVID-19.

The table below reconciles net income attributed to shareholders to core earnings for the U.S. for 2020, 2019 and 2018.

For the years ended December 31, (\$ millions)	Canadian \$			US \$		
	2020	2019	2018	2020	2019	2018
Core earnings^{(1),(2)}	\$ 1,995	\$ 1,876	\$ 1,789	\$ 1,485	\$ 1,414	\$ 1,380
Items to reconcile core earnings to net income attributed to shareholders:						
Investment-related experience related to fixed income trading, market value increases in excess of expected alternative assets investment returns, asset mix changes and credit experience	(717)	66	17	(515)	49	10
Direct impact of equity markets and interest rates and variable annuity guarantee liabilities ⁽³⁾	30	(693)	236	46	(525)	191
Change in actuarial methods and assumptions	(301)	71	286	(226)	54	219
Charge related to decision to change portfolio asset mix supporting our legacy businesses	-	-	-	-	-	-
Reinsurance transactions	262	111	68	197	84	51
Tax-related items and other ⁽⁴⁾	-	(3)	(105)	-	(2)	(83)
Net income (loss) attributed to shareholders⁽²⁾	\$ 1,269	\$ 1,428	\$ 2,291	\$ 987	\$ 1,074	\$ 1,768

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

(2) The 2018 comparatives for core earnings and net income (loss) attributed to shareholders have been updated to reflect the 2019 methodology for allocating capital and interest on surplus to our insurance segments from the Corporate and Other segment.

(3) The direct impact of markets in 2020 was a gain of US\$46 million and included a gain of US\$113 million related to fixed income reinvestment rates, partially offset by a charge of US\$67 million related to the direct impact of equity markets and variable annuity guarantee liabilities. The charge in 2019 is primarily related to fixed income reinvestment rates and changes to the URR, partially offset by gains from the direct impact of equity markets and variable annuity guarantee liabilities.

(4) Tax-related items and other in 2019 was fees related to legacy transactions. Charges in 2018 primarily relate to U.S. tax reform.

Business Performance

U.S. APE sales in 2020 of US\$455 million decreased 14% compared with 2019, as lower international universal life, domestic protection universal life, and variable universal life sales more than offset higher term life and domestic indexed universal life sales. The decline in APE sales was due to higher domestic universal life sales in advance of anticipated regulatory changes in 2019 and the unfavourable

impact of COVID-19 in 2020. Sales of products with the John Hancock Vitality PLUS feature in 2020 were US\$220 million, an increase of 17% compared with 2019.

Sales

For the years ended December 31, (\$ millions)	Canadian \$			US \$		
	2020	2019	2018	2020	2019	2018
APE sales ⁽¹⁾	\$ 609	\$ 702	\$ 553	\$ 455	\$ 530	\$ 426

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

Assets under Management

U.S. assets under management of US\$188 billion as at December 31, 2020 increased 6% from December 31, 2019. The increase was driven by the favourable impact of markets partially offset by the continued run-off of our annuities business and the reinsurance of a block of our legacy U.S. BOLI business in the third quarter of 2020 ("3Q20").

Assets under Management⁽¹⁾

As at December 31, (\$ millions)	Canadian \$			US \$		
	2020	2019	2018	2020	2019	2018
General fund ⁽²⁾	\$ 162,508	\$ 153,731	\$ 150,772	\$ 127,638	\$ 118,364	\$ 110,520
Segregated funds	77,053	76,625	72,874	60,519	58,996	53,420
Total assets under management	\$ 239,561	\$ 230,356	\$ 223,646	\$ 188,157	\$ 177,360	\$ 163,940

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

⁽²⁾ The 2018 comparatives for general fund assets under management have been updated to reflect the 2019 methodology for allocating capital and interest on surplus to our insurance segments from the Corporate and Other segment.

Revenue

Total revenue in 2020 of US\$17.3 billion decreased US\$1.2 billion compared with 2019. Revenue before net realized and unrealized investment gains and losses was US\$9.6 billion, a decrease of US\$2.6 billion compared with 2019 primarily due to the net impact of the reinsurance of a block of our legacy U.S. BOLI business in 3Q20 and lower investment income, partially offset by the impact of a one-time ceded premium in 2019 from the reinsurance of legacy annuity business.

Revenue

For the years ended December 31, (\$ millions)	Canadian \$			US \$		
	2020	2019	2018	2020	2019	2018
Gross premium income	\$ 8,952	\$ 9,588	\$ 9,335	\$ 6,678	\$ 7,227	\$ 7,201
Premiums ceded to reinsurers	(5,821)	(3,204)	(12,961)	(4,355)	(2,414)	(9,878)
Net premium income	3,131	6,384	(3,626)	2,323	4,813	(2,677)
Investment income ⁽¹⁾	7,029	7,140	7,291	5,254	5,382	5,624
Other revenue	2,711	2,654	2,542	2,025	2,000	1,966
Revenue before items noted below	12,871	16,178	6,207	9,602	12,195	4,913
Net realized and unrealized investment gains and losses ⁽²⁾	10,490	8,416	(5,621)	7,701	6,320	(4,423)
Total revenue	\$ 23,361	\$ 24,594	\$ 586	\$ 17,303	\$ 18,515	\$ 490

⁽¹⁾ The 2018 comparative for investment income has been updated to reflect the 2019 methodology for allocating capital and interest on surplus to our insurance segments from the Corporate and Other segment.

⁽²⁾ See "Financial Performance – Impact of Fair Value Accounting" above.

Strategic Highlights

At John Hancock, we are focused on building more holistic and long-lasting customer relationships by offering innovative products and solutions and making it easier for customers to do business with us. We are focused on growing our insurance business by expanding our product offerings, modernizing the delivery process, and enhancing customer experience. In 2020, we:

- Continued to see growth in our "Vitality for All" strategy with two versions of Vitality: Vitality GO and Vitality PLUS, and extending Vitality benefits to all insurance customers;
- Announced a strategic collaboration with Amazon which adds the Halo wellness band to devices supported by John Hancock's Vitality Program;
- Launched numerous digital services, such as chat bots, SMS texts, non-paper apps and digital payment tools, with the goal of improving customer satisfaction and rNPS including a new, fully underwritten term life product in the U.S. which enables customers to purchase up to US\$1 million in life insurance coverage digitally;

- Launched an eApplication to be used by brokers to streamline the application process. This online platform is a major step toward offering a fully digital end-to-end application experience;
- Implemented a digital new business/policy issue process that eliminates the reliance on paper applications for International insurance customers; and
- Extended the grace period for our life insurance policyholders to make premium payments and increased the payout limits permitted via phone for our annuity and life customers to accommodate their needs during the COVID-19 pandemic.

We continued to make significant progress to optimize our portfolio through both organic and inorganic initiatives and create tangible shareholder value through various in-force management initiatives despite the current macroenvironmental and COVID-19 challenges. In 2020, we:

- Completed legacy optimization initiatives that contributed over \$2.1 billion of cumulative capital benefits through December 31, 2020, including \$765 million in 2020;
- Completed an agreement with Global Atlantic Financial Group to reinsure a block of legacy U.S. BOLI business that resulted in a capital benefit of \$465 million;
- Continued our Annuity Guaranteed Minimum Withdrawal Benefit offer program that has released \$200 million of capital since the start of the program, including \$125 million in 2020;
- Reinsured individual and group payout annuity policies and sold the associated ALDA which enabled us to release \$90 million of capital. We expanded reinsurance coverage of certain universal life no lapse guarantee products that resulted in the release of \$70 million of capital;
- Executed on additional organic initiatives (LTC Claims Management & Wellness program) to optimize the performance of the legacy block that released an additional \$15 million of capital in 2020; and
- Continued to make progress in securing long-term care premium rate increases.

5. Global Wealth and Asset Management

Our Global Wealth and Asset Management segment, branded as Manulife Investment Management (“MIM”), provides investment advice and innovative solutions to retirement, retail, and institutional clients. Our leading capabilities in public and private markets are strengthened by an investment footprint that spans 17 countries and territories¹, including 10 markets and 120 years of on-the-ground experience in Asia. We complement these capabilities by providing access to a network of unaffiliated asset managers from around the world.

In retirement, we provide financial guidance, advice, and investment solutions to nearly 8 million plan participants and members in North America and Asia. In North America, our Canadian retirement business focuses on providing retirement solutions through defined contribution and defined benefit plans, and also to group plan members when they retire or leave their plan; and in the United States, we provide employer sponsored retirement plans as well as personal retirement accounts when individuals leave their plan. In Asia, we provide retirement offerings to employers and individuals, including Mandatory Provident Fund (“MPF”) schemes and administration in Hong Kong. Additionally, we provide retirement solutions in several emerging retirement markets in Asia including Indonesia and Malaysia.

We distribute investment funds to retail clients primarily through intermediaries and banks in North America, Europe and Asia and offer investment strategies across the world, through our affiliated and from unaffiliated asset managers. In Canada, we also provide personalized investment management, private banking and wealth and estate solutions to high net worth clients.

Our institutional asset management business provides comprehensive asset management solutions for pension plans, foundations, endowments, financial institutions and other institutional investors worldwide. Our solutions span all major asset classes including equities, fixed income, alternative assets (including real estate, timberland, farmland, private equity/debt, infrastructure, and liquid alternatives). In addition, we offer multi-asset investment solutions covering a broad range of clients’ investment needs.

We are committed to investing responsibly across our businesses. We continue to enhance and develop innovative global frameworks for sustainable investing, and maintain a high standard of stewardship where we own and operate assets.

In 2020, Global WAM contributed 17% of the Company’s core earnings from operating segments and, as at December 31, 2020, represented 58% of the Company’s total assets under management and administration.

Profitability

Global WAM’s 2020 net income attributed to shareholders was \$1,100 million compared with \$1,022 million in 2019, and core earnings were \$1,100 million in 2020 compared with \$1,021 million in 2019. Items excluded from core earnings are outlined in the table below and amounted to nil in 2020 compared with a net gain of \$1 million in 2019.

Core earnings increased \$79 million or 7% on a constant exchange rate basis driven by higher average assets under management and administration and lower general expenses from ongoing efficiency initiatives. The increase was partially offset by unfavorable product mix, lower fee spread in U.S. Retirement, and lower tax benefits.

The table below reconciles net income attributed to shareholders to core earnings for the Global WAM segment for 2020, 2019 and 2018.

For the years ended December 31, (\$ millions)	2020	2019	2018
Core earnings⁽¹⁾			
Asia	\$ 344	\$ 289	\$ 257
Canada	363	319	266
U.S.	393	413	462
Core earnings	1,100	1,021	985
Items to reconcile core earnings to net income attributed to shareholders:			
Tax-related items and other ⁽²⁾	–	1	(31)
Net income attributed to shareholders	\$ 1,100	\$ 1,022	\$ 954

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

⁽²⁾ The 2018 charge of \$31 million primarily relates to the integration of businesses acquired from Standard Chartered.

In 2020, core EBITDA² for Global WAM was \$1,676 million, \$576 million higher than core earnings. In 2019, core EBITDA was \$1,536 million, \$515 million higher than core earnings. The increase in core EBITDA of \$140 million or 8% on a constant exchange rate basis was driven by higher net fee income and lower general expenses. Core EBITDA margin¹ was 29.2% in 2020 compared with 27.5% in 2019. The 170 basis points increase was driven by the factors noted above and reflects our scale and commitment to expense efficiency.

¹ United States, Canada, Japan, Hong Kong, Singapore, Taiwan, Indonesia, Vietnam, Malaysia, India, the Philippines, the United Kingdom, Switzerland, and mainland China. In addition, we have timberland/farmland operations in Australia, New Zealand, and Brazil.

² This item is a non-GAAP measure. See “Performance and Non-GAAP Measures” below.

Core EBITDA

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

	2020	2019	2018
Core earnings⁽¹⁾	\$ 1,100	\$ 1,021	\$ 985
Amortization of deferred acquisition costs and other depreciation	319	311	301
Amortization of deferred sales commissions	85	81	98
Core income tax expense (recovery)	172	123	113
Core EBITDA⁽¹⁾	\$ 1,676	\$ 1,536	\$ 1,497
Core EBITDA margin⁽¹⁾	29.2%	27.5%	27.4%

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

Business Performance

Gross Flows and Net Flows

In 2020, gross flows of \$130.2 billion increased \$16.0 billion or 13% compared with 2019, driven by higher gross flows across all geographies. In Asia, gross flows increased \$2.4 billion or 10% compared with 2019, primarily driven by higher retail gross flows in Indonesia and higher retirement gross flows in Hong Kong. In Canada, gross flows increased \$6.8 billion or 28% compared with 2019, driven by the funding of a \$6.9 billion mandate from a new client in Institutional Asset Management in 2Q20. In the U.S., gross flows increased \$6.8 billion or 9% compared with 2019, driven by strong intermediary sales and higher institutional model allocations in Retail partially offset by the non-recurrence of several large sales in Institutional Asset Management in 2019.

Net inflows were \$8.9 billion in 2020, compared with net outflows of \$0.9 billion in 2019. In Asia, net inflows were \$3.9 billion in 2020 compared with net inflows of \$4.8 billion in 2019 reflecting lower retail net flows mainly in mainland China and Hong Kong, partially offset by higher net flows in Indonesia Retail and Hong Kong Retirement. In Canada, net inflows were \$14.6 billion in 2020 compared with net outflows of \$3.6 billion in 2019, driven by improved net inflows in Institutional Asset Management from the non-recurrence of an \$8.5 billion redemption in 2019 and the funding of a \$6.9 billion mandate from a new client in 2Q20, and in Retirement, from lower plan redemptions and individual withdrawals. In the U.S., net outflows were \$9.6 billion in 2020 compared with net outflows of \$2.0 billion in 2019, driven by a \$5.0 billion redemption of an equity mandate, and the non-recurrence of several large sales in Institutional Asset Management in 2019, as well as higher redemptions in Retirement, mainly due to member withdrawals under the U.S. CARES Act during the year.

Asia WAM

- **Gross flows** in Asia in 2020 were \$23.4 billion, an increase of 10% compared with 2019, driven by higher gross flows across all business lines. Growth was driven primarily by higher gross flows of retail money market funds in Indonesia, higher retirement gross flows in Hong Kong, and institutional fixed income product launches in mainland China.
- **Net inflows** in 2020 were \$3.9 billion compared with net inflows of \$4.8 billion in 2019, driven by retail redemptions in Indonesia, Hong Kong, and mainland China and higher redemptions in Hong Kong Retirement. This was partially offset by higher gross flows as mentioned above.

Canada WAM

- **Gross flows** in Canada in 2020 were \$30.9 billion, an increase of 28% compared with 2019, driven by the funding of a \$6.9 billion mandate from a new client in Institutional Asset Management in Canada in 2Q20 and higher gross flows across our product line-up in Retail. This was partially offset by the lower new plan sales in Retirement.
- **Net inflows** in 2020 were \$14.6 billion compared with net outflows of \$3.6 billion in 2019, driven by improved net flows in Institutional Asset Management from the non-recurrence of an \$8.5 billion redemption in 2019 and the 2Q20 funding of a \$6.9 billion mandate mentioned above, and lower plan redemptions and individual withdrawals in Retirement.

U.S. WAM¹

- **Gross flows** in the U.S. in 2020 were \$75.9 billion, an increase of 9% compared with 2019. The increase was driven by strong intermediary sales and higher institutional model allocations in Retail, partially offset by the non-recurrence of several large sales in Institutional Asset Management in 2019.
- **Net outflows** in 2020 were \$9.6 billion, compared with net outflows of \$2.0 billion in 2019, driven by a \$5.0 billion redemption of an equity mandate in Institutional Asset Management in 3Q20, higher redemptions in Retirement mainly due to member withdrawals under the U.S. CARES Act during the year, and higher retail redemptions amid market volatility in the first half of 2020. This was partially offset by higher gross flows as mentioned above.

¹ Includes performance by our operations in Europe.

Gross Flows and Net Flows⁽¹⁾

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

	2020	2019	2018
Gross flows	\$ 130,212	\$ 114,246	\$ 119,002
Net flows	8,919	(879)	1,563

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

Assets under Management and Administration

In 2020, AUMA for our wealth and asset management businesses were \$753.6 billion, 12% higher than December 31, 2019 on a constant exchange rate basis driven by the favourable impact of markets and year-to-date net inflows of \$8.9 billion. As of December 31, 2020, Global WAM also managed \$212.4 billion in assets for the Company's non-WAM reporting segments. Including those assets, AUMA managed by Global WAM was \$966.0 billion compared with \$879.2 billion as at December 31, 2019.

Assets under Management and Administration⁽¹⁾

For the years ended December 31,
(\$ billions)

	2020	2019	2018
Balance January 1,	\$ 681	\$ 609	\$ 609
Acquisitions/Dispositions	1	(1)	1
Net flows	9	(1)	2
Impact of markets and other	63	74	(3)
Balance December 31,	\$ 754	\$ 681	\$ 609
Average assets under management and administration	\$ 698	\$ 651	\$ 639

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

Revenue

Total revenue in 2020 of \$5.7 billion increased 2% compared with 2019, driven by higher average assets under management and administration, partially offset by the impact of changes in product mix and lower fee spread in the U.S. Retirement business.

Revenue

As at December 31,
(\$ millions)

	2020	2019	2018
Fee income	\$ 5,710	\$ 5,562	\$ 5,472
Investment income	39	33	(9)
Total revenue	\$ 5,749	\$ 5,595	\$ 5,463

Strategic Highlights

Leveraging our integrated business model and global scale; we have a clear strategy to pursue high-growth opportunities in the most attractive markets globally through our three business lines: Retirement, Retail and Institutional Asset Management. Our strategy includes becoming a global retirement leader by supporting financial wellness; expanding our presence in regional retail mutual fund distribution across the globe; leveraging a multi-manager model; and providing differentiated active asset management capabilities across high-performing equity and fixed income strategies, outcome-oriented solutions and alternative assets.

We executed on a number of initiatives to accelerate growth in our franchise. In 2020, we:

- Acquired a minority stake in Albamen Capital Partners, a private equity infrastructure investment manager with a focus on renewable energy, data centers and other power-intensive infrastructure assets in mainland China. This deal realizes a strategic goal for an on-the-ground infrastructure private equity capability in the Asia Pacific region and underlines the firm's strong commitment to the China market;
- Completed the formation of our previously announced joint venture with Mahindra Finance, through which we aim to expand fund offerings, drive fund penetration, and achieve long term wealth creation in India;
- Continued to develop innovative products with the launch of Hong Kong's first MPF retirement income fund, aiming to provide regular and stable income in retirement. Additionally, we announced a strategic alliance with Allianz Global Investors, strengthening our position as the largest MPF scheme sponsor;¹ and
- Once again earned top scores in the United Nations-supported Principles for Responsible Investment ("PRI") annual assessment report for integrating environmental, social, and governance ("ESG") considerations into our investment practices across a range of asset classes. Manulife Investment Management was also recognized in the PRI Leaders' Group 2020, a 10-year initiative honouring

¹ Market share of assets under management and net cash flows by scheme sponsor as reported in the Mercer MPF Market Share Reports for March 31, June 30, September 30, 2020.

signatories at the cutting edge of responsible investment. In addition, we released our second annual Sustainable and Responsible Investing Report the first that covers both Public and Private Markets.

We continued to make progress on our digital customer leader strategy. In 2020, we:

- Made extensive efforts in all regions to support clients virtually during the pandemic, prioritizing digital initiatives that simplify and enhance client interactions;
- Continued to expand our Asia online investment platform iFunds beyond Hong Kong with the launch of the technology in Malaysia. iFunds provides customers with easily accessible market and fund information to allow enhanced investment decisions;
- Launched a new retirement planner tool in the U.S. that delivers an innovative and engaging way for customers to visualize and plan for their retirement. Over 200,000, or 6% of plan participants, visited the retirement planner since it was launched in May, with 14% of those users increasing their contributions;
- Accelerated our Retail wealth digital transformation in Canada by launching several online tools and automations that make account maintenance, accessing forms and statements easier for advisors to service their customers; and
- Launched our new institutional website, which provides investors with a unified message and an integrated presentation of our global investment solutions across both public and private market asset classes.

6. Corporate and Other

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

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

Profitability

Corporate and Other reported net income attributed to shareholders of \$1,545 million in 2020 compared with a net income attributed to shareholders of \$95 million in 2019. Net income (loss) attributed to shareholders was comprised of core loss and items excluded from core loss. Core loss was \$863 million in 2020 compared with a core loss of \$99 million in 2019. Items excluded from core loss amounted to a net gain of \$2,408 million in 2020 compared with a net gain of \$194 million in 2019.

The unfavourable variance in the year-to-date core loss of \$764 million was primarily attributable to nil core investment gains in 2020 compared with \$400 million in the same period of 2019, lower investment income, less favourable impact of markets on seed money investments in new segregated and mutual funds, net losses on AFS equities in 2020 compared to net gains in 2019 and higher Corporate expenses mainly due to impairment of capitalized IT assets, primarily software, partially offset by lower interest on external debt.

The items excluded from core earnings are outlined below.

The table below reconciles net income (loss) attributed to shareholders to core loss for Corporate and Other for 2020, 2019 and 2018.

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

	2020	2019	2018
Core loss excluding core investment gains ⁽¹⁾	\$ (863)	\$ (499)	\$ (657)
Core investment gains ⁽²⁾	–	400	400
Total core loss⁽²⁾	(863)	(99)	(257)
Items to reconcile core loss to net loss attributed to shareholders:			
Direct impact of equity markets and interest rates ⁽³⁾	2,302	588	(411)
Changes in actuarial methods and assumptions	67	23	6
Investment-related experience related to mark-to-market items ⁽⁴⁾	(33)	27	59
Reclassification to core investment gains above	–	(400)	(400)
Restructuring charge ⁽⁵⁾	–	–	(263)
Tax-related items and other ⁽⁶⁾	72	(44)	135
Net income (loss) attributed to shareholders⁽¹⁾	\$ 1,545	\$ 95	\$ (1,131)

⁽¹⁾ The 2018 comparatives for core loss excluding core investment gains and net loss attributed to shareholders have been updated to reflect the 2019 methodology for allocating capital and interest on surplus to our insurance segments from the Corporate and Other segment.

⁽²⁾ This item is a non-GAAP measure. See “Performance and Non-GAAP Measures” below.

⁽³⁾ The direct impact of markets in 2020 included gains of \$2,175 million (2019 – charges of \$396 million) related to the sale of AFS bonds. Other gains of \$127 million in 2020 were mostly from fixed income investments supporting a portion of the capital in Asia that are classified as fair value through profit and loss.

⁽⁴⁾ Investment-related experience includes mark-to-market gains or losses on ALDA assets other than gains on AFS equities and seed money investments in new segregated or mutual funds.

⁽⁵⁾ Please see “Manulife Financial Corporation – Profitability” above for explanation of the restructuring charge.

⁽⁶⁾ In 2020, we reported tax benefits from the U.S. CARES Act, as a result of carrying back net operating losses to prior years, which had higher tax rates. Tax-related items and other charges in 2019 are due to a tax rate change in the province of Alberta, Canada.

Revenue

Revenue of \$2,705 million in 2020 increased \$1,606 million compared with \$1,099 million in 2019 primarily related to investment income. The increase in investment income was mainly driven by higher realized gains on AFS bonds, partially offset by lower investment income, lower gains from seed money investments and net losses from AFS equities compared to net gains in the prior year.

Revenue

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

	2020	2019	2018
Net premium income	\$ 140	\$ 112	\$ 98
Investment income (loss) ⁽¹⁾	2,830	1,073	(211)
Other revenue ⁽²⁾	(189)	(120)	(328)
Revenue before net realized and unrealized investment gains and losses and on the macro hedge program	2,781	1,065	(441)
Net realized and unrealized investment gains and losses ⁽³⁾ and on the macro hedge program	(76)	34	56
Total revenue	\$ 2,705	\$ 1,099	\$ (385)

⁽¹⁾ The 2018 comparative for investment income has been updated to reflect the 2019 methodology for allocating capital and interest on surplus to our insurance segments from the Corporate and Other segment.

⁽²⁾ Includes a consolidation adjustment related to asset management fees earned by Manulife Investment Management from affiliated business (the offset to the consolidation adjustment is investment expense).

⁽³⁾ See "Manulife Financial Corporation – Impact of Fair Value Accounting" above.

Strategic Highlights

Our P&C Reinsurance business provides substantial retrocessional capacity for a very select clientele in the property and casualty reinsurance market. The business is largely non-correlated to Manulife's other businesses and helps diversify our overall business mix. We manage the risk exposure of this business in relation to the total Company balance sheet risk and volatility as well as the prevailing market pricing conditions. The business is renewable annually, and we currently estimate our exposure limit in 2021 for a single event to be approximately US\$300 million (net of reinstatement premiums) and for multiple events to be approximately US\$500 million (net of all premiums).¹

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

7. Investments

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

General Fund Assets

As at December 31, 2020, our General Fund invested assets totaled \$411.0 billion compared with \$378.5 billion at the end of 2019. The following table shows the asset class composition as at December 31, 2020 and December 31, 2019.

As at December 31, (\$ billions)	2020			2019		
	Carrying value	% of total	Fair value	Carrying value	% of total	Fair value
Cash and short-term securities	\$ 26.2	6	\$ 26.2	\$ 20.3	5	\$ 20.3
Debt Securities and Private Placement Debt						
Government bonds	80.8	20	80.8	73.4	20	73.4
Corporate bonds	134.8	33	134.8	121.3	32	121.3
Securitized / asset-backed securities	3.1	1	3.1	3.4	1	3.4
Private placement debt	40.8	10	47.9	38.0	10	41.8
Mortgages	50.2	12	54.2	49.4	14	51.5
Policy loans and loans to bank clients	8.4	2	8.4	8.2	2	8.2
Public equities ⁽¹⁾	23.7	6	23.7	22.8	5	22.8
Alternative Long-Duration Assets (“ALDA”)						
Real Estate	12.8	3	14.0	12.9	4	14.3
Infrastructure	9.1	2	9.4	8.9	2	9.0
Timberland and Farmland	4.8	1	5.4	4.7	1	5.2
Private Equity	8.0	2	8.0	6.4	2	6.4
Oil & Gas	2.3	1	2.3	3.2	1	3.3
Other ALDA	2.0	0	2.0	1.7	0	1.7
Leveraged Leases and Other	4.0	1	4.0	3.9	1	3.9
Total general fund invested assets	\$ 411.0	100	\$ 424.2	\$ 378.5	100	\$ 386.5

⁽¹⁾ Includes \$229 million of public equities that are managed in conjunction with our alternative long duration asset strategy.

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

As at December 31, 2020, the carrying value of renewable energy assets, including energy efficiency projects, was \$13.7 billion (2019 – \$14.0 billion).

Shareholders’ accumulated other comprehensive pre-tax income (loss) at December 31, 2020 consisted of a \$2,056 million gain for bonds (2019 – gain of \$1,626 million) and a \$255 million gain for public equities (2019 – gain of \$350 million). Included in the \$2,056 million gain for bonds was a \$317 million loss related to the fair value hedge basis adjustments on AFS bonds (2019 – loss of \$497 million).

Debt Securities and Private Placement Debt

We manage our high-quality fixed income portfolio to optimize yield and quality while ensuring that asset portfolios remain diversified by sector, industry, issuer, and geography. As at December 31, 2020, our fixed income portfolio of \$259.5 billion (2019 – \$236.1 billion) was 97% investment grade (rated BBB or better) and 73% was rated A or higher (2019 – 98% and 75%, respectively). Our private placement debt holdings provide diversification benefits (issuer, industry, and geography) and, because they often have stronger protective covenants and collateral than debt securities, they typically provide better credit protection and potentially higher recoveries in the event of default. Geographically, 25% is invested in Canada (2019 – 25%), 47% is invested in the U.S. (2019 – 47%), 4% is invested in Europe (2019 – 4%) and the remaining 24% is invested in Asia and other geographic areas (2019 – 24%).

Debt Securities and Private Placement Debt – by Credit Quality⁽¹⁾

As at December 31, (\$ billions)	2020				2019			
	Debt securities	Private placement debt	Total	% of Total	Debt securities	Private placement debt	Total	% of Total
AAA	\$ 40.7	\$ 1.1	\$ 41.8	16	\$ 36.1	\$ 1.1	\$ 37.2	16
AA	37.1	4.8	41.9	16	34.3	5.5	39.8	17
A	89.4	15.6	105.0	41	84.2	14.3	98.5	42
BBB	47.2	15.8	63.0	24	40.6	14.1	54.7	23
BB	3.0	1.2	4.2	2	2.0	0.9	2.9	1
B & lower, and unrated	1.3	2.3	3.6	1	0.9	2.1	3.0	1
Total carrying value	\$ 218.7	\$ 40.8	\$ 259.5	100	\$ 198.1	\$ 38.0	\$ 236.1	100

⁽¹⁾ Reflects credit quality ratings as assigned by Nationally Recognized Statistical Rating Organizations (“NRSRO”) using the following priority sequence order: S&P Global Ratings (“S&P”), Moody’s Investors Services (“Moody’s”), DBRS Limited (“DBRS”), Fitch Ratings Inc. (“Fitch”), Rating and Investment Information, and Japan Credit Rating. For those assets where ratings by NRSRO are not available, disclosures are based upon internal ratings as described in the “Risk Factors and Risk Management” section below.

Debt Securities and Private Placement Debt – by Sector

As at December 31, Per cent of carrying value	2020			2019		
	Debt securities	Private placement debt	Total	Debt securities	Private placement debt	Total
Government and agency	37	12	33	37	12	33
Utilities	15	39	18	15	41	19
Financial	15	8	14	15	6	13
Industrial	8	12	9	8	10	8
Consumer (non-cyclical)	7	14	8	6	14	8
Energy – Oil & Gas	8	5	8	5	5	5
Energy – Other	0	1	0	4	1	4
Consumer (cyclical)	3	6	3	3	7	3
Securitized (MBS/ABS)	1	1	1	2	1	2
Telecommunications	2	0	2	2	1	2
Basic materials	2	2	2	2	2	2
Technology	1	0	1	1	–	1
Media and internet and other	1	0	1	–	–	–
Total per cent	100	100	100	100	100	100
Total carrying value (\$ billions)	\$ 218.7	\$ 40.8	\$ 259.5	\$ 198.1	\$ 38.0	\$ 236.1

As at December 31, 2020, gross unrealized losses on our fixed income holdings were \$0.6 billion or 0.3% of the amortized cost of these holdings (2019 – \$0.6 billion or 0.3%). Of this amount, \$16 million (2019 – \$71 million) related to debt securities trading below 80% of amortized cost for more than 6 months. Securitized assets represented \$10 million of the gross unrealized losses and none of the amounts trade below amortized cost for more than 6 months (2019 – \$4 million and none, respectively). After adjusting for debt securities supporting participating policyholder and pass-through products and the provisions for credit included in the insurance and investment contract liabilities, the potential impact to shareholders’ pre-tax earnings for debt securities trading at less than 80% of amortized cost for greater than 6 months was approximately \$14 million as at December 31, 2020 (2019 – \$48 million).

Mortgages

As at December 31, 2020, our mortgage portfolio of \$50.2 billion represented 12% of invested assets (2019 – \$49.4 billion and 13%, respectively). Geographically, 65% of the portfolio is invested in Canada (2019 – 65%) and 35% is invested in the U.S. (2019 – 35%). As shown below, the overall portfolio is also diversified by geographic region, property type, and borrower. Of the total mortgage portfolio, 14% is insured (2019 – 15%), primarily by the Canada Mortgage and Housing Corporation (“CMHC”) – Canada’s AAA rated government-backed national housing agency, with 31% of residential mortgages insured (2019 – 33%) and 2% of commercial mortgages insured (2019 – 2%).

As at December 31, (\$ billions)	2020		2019	
	Carrying value	% of total	Carrying value	% of total
Commercial				
Retail	\$ 8.6	17	\$ 8.8	18
Office	8.7	17	8.9	18
Multi-family residential	5.8	11	5.4	11
Industrial	2.9	6	2.5	5
Other commercial	3.5	7	3.2	6
	29.6	58	28.8	58
Other mortgages				
Manulife Bank single-family residential	20.4	41	20.1	41
Agricultural	0.3	1	0.5	1
Total mortgages	\$ 50.2	100	\$ 49.4	100

Our commercial mortgage loans are originated with a hold-for-investment philosophy. They have low loan-to-value ratios, high debt-service coverage ratios, and as at December 31, 2020 there were no loans in arrears. Geographically, of the total commercial mortgage loans, 42% are in Canada and 58% are in the U.S. (2019 – 41% and 59%, respectively). We are diversified by property type and largely avoid risky market segments such as hotels, construction loans and second liens.

Non-CMHC Insured Commercial Mortgages⁽¹⁾

As at December 31,	2020		2019	
	Canada	U.S.	Canada	U.S.
Loan-to-Value ratio ⁽²⁾	62%	58%	62%	56%
Debt-Service Coverage ratio ⁽²⁾	1.46x	1.83x	1.48x	1.87x
Average duration (years)	4.9	6.8	4.8	6.5
Average loan size (\$ millions)	\$ 17.9	\$ 18.9	\$ 17.7	\$ 18.0
Loans in arrears ⁽³⁾	0.00%	0.00%	0.00%	0.00%

⁽¹⁾ Excludes Manulife Bank commercial mortgage loans of \$407 million (2019 – \$361 million).

⁽²⁾ Loan-to-Value and Debt-Service Coverage are based on re-underwritten cash flows.

⁽³⁾ Arrears defined as over 90 days past due in Canada and over 60 days past due in the U.S.

Public Equities

As at December 31, 2020, public equity holdings of \$23.7 billion represented 6% (2019 – \$22.8 billion and 6%) of invested assets and, when excluding assets supporting participating policyholder and pass-through products, represented 1% (2019 – 2%) of invested assets. The portfolio is diversified by industry sector and issuer. Geographically, 27% (2019 – 27%) is held in Canada; 36% (2019 – 36%) is held in the U.S.; and the remaining 37% (2019 – 37%) is held in Asia, Europe and other geographic areas.

Public Equities – classified by type of product-line supported

As at December 31, (\$ billions)	2020		2019	
	Carrying value	% of total	Carrying value	% of total
Participating Policyholders	\$ 13.1	55	\$ 11.6	51
Pass-through products	5.8	25	5.4	24
Corporate and Other segment ⁽¹⁾	3.2	14	4.6	20
Non-participating products	1.6	7	1.2	5
Total public equities⁽²⁾	\$ 23.7	100	\$ 22.8	100

⁽¹⁾ Includes \$1.8 billion of AFS equities and \$1.4 billion of seed money investments in new segregated and mutual funds.

⁽²⁾ Includes \$229 million of public equities that are managed in conjunction with our alternative long duration asset strategy.

Alternative Long-Duration Assets (“ALDA”)

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

As at December 31, 2020, carrying value of ALDA of \$39.0 billion represented 9% (2019 – \$37.8 billion and 10%) of invested assets. The fair value of total ALDA was \$41.0 billion at December 31, 2020 (2019 – \$39.9 billion). The carrying value and corresponding fair value by sector and/or asset type are outlined above (see table in the section “General Fund Assets”).

Real Estate

Our real estate portfolio is diversified by geographic region; of the total fair value of this portfolio, 40% is located in the U.S., 43% in Canada, and 17% in Asia as at December 31, 2020 (2019 – 43%, 43%, and 14%, respectively). This high-quality portfolio has virtually no leverage and is primarily invested in premium urban office towers, concentrated in cities with stable growth, and highly diverse economies, in North America and Asia. The portfolio is well positioned with an average occupancy rate of 92% (2019 – 94%) and an average lease term of 6.2 years (2019 – 5.7 years). During 2020, we executed 5 acquisitions representing \$0.3 billion market value of commercial real estate assets (2019 – 1 acquisition and \$0.1 billion). As part of ongoing portfolio management initiatives, \$0.6 billion of commercial real estate assets were sold during 2020.

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

As at December 31, (\$ billions)	2020		2019	
	Fair value	% of total	Fair value	% of total
Company Own-Use	\$ 3.0	21	\$ 3.3	23
Office – Downtown	5.3	38	5.6	39
Office – Suburban	1.5	11	1.7	12
Industrial	1.6	11	1.0	7
Residential	1.9	14	1.9	13
Retail	0.4	3	0.4	3
Other	0.3	2	0.4	3
Total real estate⁽¹⁾	\$ 14.0	100	\$ 14.3	100

⁽¹⁾ These figures represent the fair value of the real estate portfolio. The carrying value of the portfolio was \$12.8 billion and \$12.9 billion at December 31, 2020 and December 31, 2019, respectively.

Infrastructure

We invest both directly and through funds in a variety of industry specific asset classes, listed below. The portfolio is well-diversified with almost 400 portfolio companies. The portfolio is predominately invested in the U.S. and Canada, but also in the United Kingdom, Western Europe, Latin America and Australia. Our power and infrastructure holdings are as follows:

As at December 31, (\$ billions)	2020		2019	
	Carrying value	% of total	Carrying value	% of total
Power generation	\$ 4.1	45	\$ 3.9	44
Transportation (including roads, ports)	2.5	27	2.1	24
Electric and gas regulated utilities	0.4	5	1.0	12
Electricity transmission	0.1	1	0.1	1
Water distribution	0.1	1	0.1	1
Midstream gas infrastructure	0.6	7	0.5	6
Maintenance service, efficiency and social infrastructure	0.2	2	0.2	2
Telecommunications/Tower	1.0	11	0.7	8
Other infrastructure	0.1	1	0.3	2
Total infrastructure	\$ 9.1	100	\$ 8.9	100

Timberland & Farmland

Our timberland and farmland assets are managed by a proprietary entity, Hancock Natural Resources Group (“HNRG”). In addition to being the world’s largest timberland investment manager for institutional investors,¹ with timberland properties in the U.S., New Zealand, Australia, Chile and Canada, HNRG also manages farmland properties in the U.S., Australia and Canada. The General Fund’s timberland portfolio comprised 23% of HNRG’s total timberland assets under management (“AUM”) (2019 – 22%). The farmland portfolio includes annual (row) crops, fruit crops, wine grapes, and nut crops. The General Fund’s holdings comprised 42% of HNRG’s total farmland AUM (2019 – 40%).

Private Equities

Our private equity portfolio of \$8.0 billion (2019 – \$6.4 billion) includes both directly held private equity and private equity funds. Both are diversified across vintage years and industry sectors.

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

Oil & Gas

This category is comprised of \$0.6 billion (2019 – \$1.0 billion) in our conventional Canadian oil and gas properties managed by our subsidiary, NAL Resources, and various other oil and gas private equity interests of \$1.7 billion (2019 – \$2.2 billion). The sale of NAL Resources to Whitecap Resources Inc. closed on January 4, 2021, in exchange for publicly traded shares in Whitecap Resources Inc. Production mix for conventional oil and gas assets in 2020 was approximately 35% crude oil, 45% natural gas, and 20% natural gas liquids (2019 – 36%, 47%, and 17%, respectively). Private equity interests are a combination of both producing and mid-streaming assets.

In 2020, the carrying value of our oil and gas holdings decreased by \$1.0 billion and the fair value decreased by \$1.0 billion.

Investment Income

For the years ended December 31,
(\$ millions, unless otherwise stated)

	2020	2019
Interest income	\$ 11,813	\$ 11,488
Dividend, rental and other income ⁽¹⁾	2,458	2,988
Impairments	(703)	56
Other, including gains and losses on sale of AFS debt securities	2,865	861
Investment income before realized and unrealized gains on assets supporting insurance and investment contract liabilities and on macro equity hedges	16,433	15,393
Realized and unrealized gains and losses on assets supporting insurance and investment contract liabilities and on macro equity hedges		
Debt securities	10,748	11,528
Public equities	1,917	2,870
Mortgages and private placements	39	(36)
Alternative long-duration assets and other investments	(214)	1,262
Derivatives, including macro equity hedging program	6,477	2,576
	18,967	18,200
Total investment income	\$ 35,400	\$ 33,593

⁽¹⁾ Rental income from investment properties is net of direct operating expenses.

In 2020, the \$35.4 billion of investment income (2019 – \$33.6 billion) consisted of:

- \$16.4 billion of investment income before net realized and unrealized gains on assets supporting insurance and investment contract liabilities and on macro equity hedges (2019 – \$15.4 billion); and
- \$19.0 billion of net realized and unrealized gains on assets supporting insurance and investment contract liabilities and on macro equity hedges (2019 – gains of \$18.2 billion).

The \$1.0 billion increase in net investment income before unrealized and realized gains was due to gains of \$2.9 billion on surplus assets mainly from the sale of government bonds (compared to \$0.9 billion gains in 2019); partially offset by an increase of \$0.8 billion in impairments mainly due to investments in oil and gas.

Net realized and unrealized gains on assets supporting insurance and investment contract liabilities and on the macro hedge program was a gain of \$19.0 billion for full year 2020 compared with a gain of \$18.2 billion for full year 2019. The full year 2020 gain largely resulted from interest rate decreases in U.S., Canada and Asia. The 10 year government bonds for the U.S., Canada, and Hong Kong decreased 100 bps, 103 bps and 104 bps, respectively. Additional gains were driven by positive equity market performance as all major indices were up during the year. The S&P 500 increased 16.3% and S&P/TSX 2.2%.

Fair value accounting policies affect the measurement of both our assets and our liabilities. Refer to “Financial Performance” above.

8. Fourth Quarter Financial Highlights

Profitability

As at and for the quarters ended December 31,
(\$ millions, unless otherwise stated)

	2020	2019	2018
Profitability:			
Net income attributed to shareholders	\$ 1,780	\$ 1,228	\$ 593
Core earnings ^{(1),(2)}	\$ 1,474	\$ 1,477	\$ 1,337
Diluted earnings per common share (\$)	\$ 0.89	\$ 0.61	\$ 0.28
Diluted core earnings per common share (\$) ⁽¹⁾	\$ 0.74	\$ 0.73	\$ 0.65
Return on common shareholders' equity ("ROE")	14.1%	10.3%	5.3%
Core ROE ⁽¹⁾	11.6%	12.5%	12.5%

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

⁽²⁾ Impact of currency movement on the fourth quarter of 2020 ("4Q20") core earnings compared with the fourth quarter of 2019 ("4Q19") was a \$10 million unfavourable variance.

Manulife's 4Q20 net income attributed to shareholders was \$1,780 million compared with \$1,228 million in 4Q19. Net income attributed to shareholders is comprised of core earnings (consisting of items we believe reflect the underlying earnings capacity of the business), which amounted to \$1,474 million in 4Q20 compared with \$1,477 million in 4Q19, and items excluded from core earnings, which amounted to a net gain of \$306 million in 4Q20 compared with charges of \$249 million in 4Q19. Net income attributed to shareholders in 4Q20 increased compared with 4Q19 primarily driven by higher investment-related experience gains, gains from reinsurance transactions compared with losses in 4Q19, and a lower charge from the direct impact of markets.

The \$3 million decrease in core earnings compared with 4Q19 reflects the absence of core investment gains in the quarter (compared with gains in 4Q19) and lower investment income in Corporate and Other offset by the favourable impact of in-force business growth in Asia and the U.S., higher average AUMA in Global Wealth and Asset Management, favourable experience in our P&C Reinsurance business, and lower general expenses. Core earnings in 4Q20 included net policyholder experience losses of \$27 million post-tax (\$40 million pre-tax) compared with losses of \$22 million post-tax (\$38 million pre-tax) in 4Q19.¹ Actions to improve the capital efficiency of our legacy businesses resulted in \$5 million of lower core earnings in 4Q20 compared with 4Q19.

Core earnings by segment is presented in the table below for the periods presented.

For the quarters ended December 31,
(\$ millions)

	2020	2019
Core earnings⁽¹⁾		
Asia	\$ 571	\$ 494
Canada	316	288
U.S.	479	489
Global Wealth and Asset Management	304	265
Corporate and Other (excluding core investment gains)	(196)	(159)
Core investment gains ⁽¹⁾	-	100
Core earnings	\$ 1,474	\$ 1,477

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

In Asia, core earnings were \$571 million in 4Q20 compared with \$494 million in 4Q19, an increase of 16%, after adjusting for the impact of changes in foreign currency exchange rates. The increase in core earnings was driven by in-force business growth across Asia, favourable new business primarily from product mix in Hong Kong and Vietnam and disciplined expense management, partially offset by lower new business volumes in Hong Kong.

In Canada, core earnings were \$316 million in 4Q20 compared with \$288 million in 4Q19. The 10% increase primarily reflected favourable policyholder experience in our insurance businesses, partially offset by a number of smaller experience-related items.

In the U.S., core earnings were \$479 million in 4Q20 compared with \$489 million in 4Q19. The 1% decrease was driven by unfavourable life insurance policyholder experience, which included modest COVID-19 related claim losses and the non-recurrence of tax benefits in 4Q19 from the closure of prior year tax audits. These items were largely offset by favourable long-term care policyholder experience, resulting from claim terminations due to the impact of COVID-19, higher in-force earnings, and a focus on reduced spending in the current economic environment.

Global Wealth and Asset Management core earnings were \$304 million in 4Q20 compared with \$265 million in 4Q19. The 15% increase was driven primarily by higher average assets under management and administration and lower general expenses from ongoing efficiency initiatives, partially offset by unfavourable impacts from changes in product mix, lower fee spread in the U.S. Retirement business, and lower tax benefits.

¹ Policyholder experience includes gains of \$13 million in 2020 from customers who have opted to change their existing medical coverage to the VHIS products in Hong Kong (4Q19 – gains of \$20 million). These gains did not have a material impact on core earnings as they were offset by new business strain.

Corporate and Other core loss excluding core investment gains was \$196 million in 4Q20 compared with \$159 million in 4Q19. The \$37 million increase in core loss was primarily driven by lower investment income and higher Corporate expenses due to impairment of capitalized IT assets, primarily software, partially offset by the favourable impact of markets on seed money investments in segregated funds and mutual funds and favourable experience in our P&C Reinsurance business in 4Q20.

The table below reconciles net income attributed to shareholders to core earnings for the periods presented and provides further details for each of the items excluded from core earnings.

For the quarters ended December 31,
(\$ millions)

	2020	2019
Core earnings⁽¹⁾	\$ 1,474	\$ 1,477
Items excluded from core earnings		
Investment-related experience outside of core earnings ⁽²⁾	585	182
Direct impact of equity markets and interest rates and variable annuity guarantee liabilities (see table below)	(323)	(389)
<i>Direct impact of equity markets and variable annuity guarantee liabilities⁽³⁾</i>	<i>351</i>	125
<i>Fixed income reinvestment rates assumed in the valuation of policy liabilities⁽⁴⁾</i>	<i>(846)</i>	(583)
<i>Sale of AFS bonds and derivative positions in the Corporate and Other segment</i>	<i>172</i>	69
Reinsurance transactions ⁽⁵⁾	44	(34)
Tax-related items and other ⁽⁶⁾	-	(8)
Total items excluded from core earnings	306	(249)
Net income (loss) attributed to shareholders	\$ 1,780	\$ 1,228

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

⁽²⁾ Total investment-related experience in 4Q20 was a net gain of \$585 million, compared with a net gain of \$282 million in 4Q19, and in accordance with our definition of core earnings, we included no investment-related experience gains in core earnings and a \$585 million gain in items excluded from core earnings in 4Q20 (gains of \$100 million and \$182 million, respectively, in 4Q19). Investment-related experience gains in 4Q20 reflected the favourable impact of fixed income reinvestment activities, higher-than-expected returns (including fair value changes) on ALDA primarily driven by fair value gains on private equity and the estimated impact of the sale of NAL and strong credit experience, partially offset by lower-than-expected returns on real estate. The sale of NAL to Whitecap Resources Inc. closed on January 4, 2021, in exchange for publicly traded shares in Whitecap Resources Inc. Investment-related experience gains in 4Q19 reflected favourable impact of fixed income reinvestment activities and higher-than-expected returns (including fair value changes) on ALDA.

⁽³⁾ In 4Q20, the net gains related to equity markets of \$351 million included a gain of \$1,613 million from gross equity exposure partially offset by a charge of \$1,253 million from dynamic hedging experience and a modest charge of \$9 million from macro hedge experience. In 4Q19, the net gains of \$125 million included a gain of \$1,354 million from gross equity exposure partially offset by a charge of \$1,226 million from dynamic hedging experience and a modest charge of \$3 million from macro hedge experience.

⁽⁴⁾ The \$846 million charge in 4Q20 was driven by narrowing corporate spreads, primarily in the U.S. The \$583 million charge in 4Q19 primarily relates to lower corporate spreads and a decrease in the fair value of interest rate derivatives which more than offset the decrease in liabilities arising from a steepening of the yield curve in the U.S. and Canada.

⁽⁵⁾ In 4Q20, reinsurance transactions in Asia and Canada contributed gains of \$29 million and \$15 million, respectively. In 4Q19, the reinsurance transactions in Canada was a charge of \$34 million.

⁽⁶⁾ Tax-related items and other charges in 4Q19 related to legacy transaction fees.

Business Performance

As at and for the quarters ended December 31,
(\$ millions, unless otherwise stated)

	2020	2019	2018
Asia APE sales	\$ 996	\$ 975	\$ 1,040
Canada APE sales	245	271	277
U.S. APE sales	178	249	152
Total APE sales⁽¹⁾	1,419	1,495	1,469
Asia new business value	368	390	402
Canada new business value	65	59	51
U.S. new business value	56	77	48
Total new business value⁽¹⁾	489	526	501
Global Wealth and Asset Management gross flows (\$ billions) ⁽¹⁾	31.5	32.9	26.3
Global Wealth and Asset Management net flows (\$ billions) ⁽¹⁾	2.8	4.9	(9.0)
Global Wealth and Asset Management assets under management and administration (\$ billions) ⁽¹⁾	753.6	681.2	608.8

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

Sales

APE sales were \$1.4 billion in 4Q20, a decrease of 5% compared with 4Q19. In Asia, APE sales increased 2% compared with 4Q19 as growth in sales in Japan from COLI and higher Asia Other sales from Vietnam and Singapore, were partially offset by lower sales in Hong Kong, due to the tightening of COVID-19 containment measures. In Canada, APE sales decreased 10% compared with 4Q19 primarily driven by lower small and mid-size group insurance and individual insurance sales due to the adverse impact of COVID-19, partially offset by higher sales in our lower risk segregated funds. In the U.S., APE sales decreased 28% compared with 4Q19, as international universal life sales were unfavourably impacted by COVID-19 and domestic universal life sales decreased compared with a strong 4Q19, which benefited from higher sales in advance of anticipated regulatory changes.

New Business Value was \$489 million in 4Q20, a decrease of 7% compared with 4Q19. In Asia, NBV of \$368 million was down 5% compared with 4Q19, due to lower sales volumes in Hong Kong and less favourable product mix in Japan, partially offset by higher sales and more favourable product mix in Asia Other. In Canada, NBV of \$65 million increased 10% compared with 4Q19, primarily driven by higher margins across all business lines, partially offset by lower volumes in small and mid-size group insurance and individual insurance. In the U.S., NBV of \$56 million was down 26% compared with 4Q19, driven primarily by lower international universal life sales volumes.

Global Wealth and Asset Management net inflows were \$2.8 billion in 4Q20 compared with net inflows of \$4.9 billion in 4Q19. Net inflows in Asia were \$2.2 billion in 4Q20 compared with net inflows of \$0.2 billion in 4Q19, driven by lower redemptions in Institutional Asset Management and higher gross flows of retail money market funds in Indonesia. Net inflows in Canada were \$2.2 billion in 4Q20 compared with net inflows of \$1.0 billion in 4Q19, driven by lower plan redemptions in Retirement and higher gross flows across the product line-up in Retail. Net outflows in the U.S. were \$1.6 billion in 4Q20 compared with net inflows of \$3.7 billion in 4Q19, driven by higher redemptions across all business lines and lower new plan sales in Retirement and the non-recurrence of several large sales in Institutional Asset Management in 4Q19, partially offset by higher net inflows in Retail from strong intermediary sales.

Global Wealth and Asset Management gross flows were \$31.5 billion in 4Q20 compared with \$32.9 billion in 4Q19. In Asia, gross flows were 15% higher compared with 4Q19, driven by higher gross flows of retail money market funds in Indonesia and higher retirement gross flows in Hong Kong. In Canada, gross flows were in line with 4Q19 as higher gross flows across the product line-up in Retail offset the non-recurrence of several large fixed income sales in Institutional Asset Management in 4Q19. In the U.S., gross flows were 11% lower compared with 4Q19, driven by lower new plan sales in Retirement and the non-recurrence of several large sales in Institutional Asset Management in 4Q19, partially offset by strong intermediary sales in Retail.

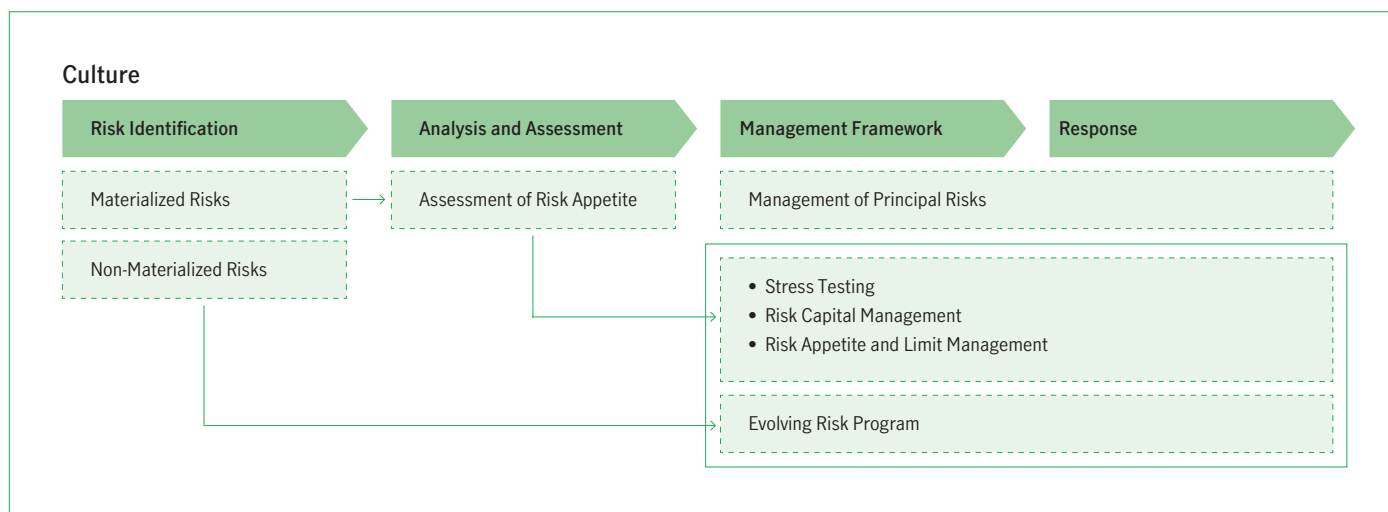
9. Risk Factors and Risk Management

This section provides an overview of our overall risk management approach along with detailed description of specific risks which may affect our results of operations or financial condition and the strategies used to manage those risks.

Enterprise Risk Management Framework

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

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



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

- **Risk roles and authorities** – Assignment of accountability and delegation of authority for risk oversight and risk management at various levels within the Company, as well as accountability principles;
- **Governance and strategy** – The types and levels of risk the Company seeks given its strategic plan, the internal and external environment, and risk appetite which drives risk limits and policies;
- **Execution** – Risk identification, measurement, assessment and mitigation which enable those accountable for risks to manage and monitor their risk profile; and
- **Evaluation** – Validation, back testing and independent oversight to confirm that the Company generated the risk profile it intended, root cause analysis of any notable variation, and any action required to re-establish desired levels when exposures materially increase to bring exposures back to desired levels and achieve higher levels of operational excellence.

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

Three Lines of Defense Model

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

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

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

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

Culture

To enable the achievement of our mission and strategic priorities, we are committed to a set of shared values, which reflect our culture, inform our behaviours, and help define how we work together:

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

Risk Culture Vision – Within this context, we strive for a risk aware culture, where individuals and groups are encouraged, feel comfortable and are proactive in making transparent, balanced risk-return decisions that are in the long-term interests of the Company.

Risk Culture Framework – We have set a framework of desired behaviours to foster a strong risk aware culture. The framework is assessed against a set of qualitative and quantitative indicators and regularly reported to the Board and executive leadership, with the intent to continuously identify opportunities to increase risk awareness across all geographies, businesses and layers of management and staff.

We believe that risk culture is strengthened once desired organizational behaviours and attitudes are reinforced through effective application of our corporate values. As such, we communicate key elements of our values through a risk lens to build a strong risk aware culture, including:

- **Transparency** – Encourage an environment where we can get it done together by openly discussing the strengths, weaknesses and potential range of outcomes of an issue, proposal or initiative and making informed decisions. Escalate issues before they become significant problems.
- **Risk appetite** – Once we have identified a risk or situation, we establish a risk appetite and own that decision. We establish appropriate limits and associated delegated authority so we can confidently execute our strategy within our risk appetite.
- **Learn** – Use mistakes and failures as learning moments and share what was learned; think big by sharing beyond teams and business units. Seek out lessons learned from throughout the organization in order to continuously improve and grow our business the right way.
- **Incentives** – Align personal incentives with our goals and how we want to execute our plan. When things go wrong, share our humanity by planning our reaction and maintaining a supportive environment to ensure appropriate incentives for continued transparency and lessons learned.

Risk Governance

The Board of Directors oversees our culture of integrity and ethics, strategic planning, risk management, and corporate governance, among other things. The Board of Directors carries out its responsibilities directly and through its four standing committees:

- **Risk Committee** – Oversees the management of our principal risks, and our programs, policies and procedures to manage those risks.
- **Audit Committee** – Oversees internal control over financial reporting and our finance, actuarial, internal audit and global compliance functions, serves as the conduct review committee, reviews our compliance with legal and regulatory requirements and oversees the performance, qualifications and independence of our external auditors.
- **Management Resources and Compensation Committee** – Oversees our global human resources strategy, policies, programs, management succession, executive compensation, and pension plan governance.
- **Corporate Governance and Nominating Committee** – Develops our governance policies, practices and procedures, among other activities.

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

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

The ERC approves and oversees the execution of the Company's enterprise risk management program. It establishes and presents for approval to the Board of Directors the Company's risk appetite and enterprise-wide risk limits and monitors our overall risk profile, including key and emerging risks and risk management activities. As part of these activities, the ERC monitors material risk exposures, endorses and reviews strategic risk management priorities, and reviews and assesses the impact of business strategies, opportunities and initiatives on our overall risk position. The ERC is supported by a number of oversight sub-committees including:

- **Credit Committee** – Establishes credit risk policies and risk management standards of practice and oversees the credit risk management program. Also monitors the Company's overall credit risk profile and approves large individual credits and investments.
- **Product Oversight Committee** – Oversees insurance risk and reviews risks in new product and new business reinsurance initiatives. Also monitors product design, new product pricing, and insurance risk exposures and trends.
- **Global Asset Liability Committee** – Oversees market and liquidity risk for insurance products, hedging, and asset liability management programs and strategies. Also monitors market risk profile, risk exposures, risk mitigation activities and compliance with related policies.
- **Operational Risk Committee** – Oversees operational risk appetite, exposures and associated governance, risk processes, risk management activities and compliance with related policies.

We also have segment risk committees, each with mandates similar to the ERC except with a focus at the segment as applicable.

Risk Appetite

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

Risk Philosophy – Manulife is a global financial institution offering insurance, wealth and asset management products and other financial services. The activities required to achieve our mission of "Decisions made easier. Lives made better" are guided by our values and involve elements of risk taking. As such, when making decisions about risk taking and risk management, the Company places a priority on the following risk management objectives:

- To safeguard the commitments and expectations established with our customers, creditors, shareholders and employees;
- To support the successful design and delivery of customer solutions;
- To prudently and effectively deploy the capital invested in the Company by shareholders with appropriate risk/return profiles;
- To invest wealth and asset management's customer assets consistent with their objectives;
- To achieve and maintain a high level of operational resilience, while safeguarding the wellbeing of our employees;
- To protect and/or enhance the Company's reputation and brand; and
- To maintain the Company's targeted financial strength rating.

While we only pursue risks we can appropriately analyze and monitor, we also manage risks which arise outside of our direct influence. We recognize that risk exposures change over time. If exposures materially increase, we will activate management actions designed to bring exposures back to desired levels. As an integrated component of our business model, risk management assists the Company in achieving our objectives and in reaching higher levels of operational excellence, while encouraging transparency and organizational learning.

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

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

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

Risk Identification, Measurement and Assessment

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

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

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

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

Risk Monitoring and Reporting

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

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

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

Risk Control and Mitigation

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

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

Principal Risk Categories

Our insurance, wealth and asset management and other financial services businesses subject Manulife to a broad range of risks. Management has identified the following risks and uncertainties to which our businesses, operations and financial condition are subject grouped under five principal risk categories: strategic risk, market risk, credit risk, product risk and operational risk. The following sections also describe the risk management strategies for each of these risk categories. The risks and uncertainties described below are not the only ones facing us. Additional risks not presently known to us or that are currently immaterial could also impair our businesses, operations and financial condition. If any of such risks should occur, the trading price of our securities, including common shares, preferred shares and debt securities, could decline, and you may lose all or part of your investment.

Strategic Risk

Strategic risk is the risk of loss resulting from the inability to adequately plan or implement an appropriate business strategy that allows us to effectively compete in the markets in which we operate, or to adapt to change in the external business, political or regulatory environment.

We operate in highly competitive markets and compete for customers with both insurance and non-insurance financial services companies. Customer loyalty and retention, and access to distributors, are important to the Company's success and are influenced by many factors, including our distribution practices and regulations, product features, service levels including digital capabilities, prices, investment performance, and our financial strength ratings and reputation. Our ability to effectively compete is highly dependent upon being quick to react and adapt to changes from the external environment while continuing to proactively drive internal innovation.

The following section describes strategies to manage strategic risk, as well as details on strategic risk factors:

Strategic Risk Management Strategy

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

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

Reputation risk is the risk that the Company's corporate image may be eroded by adverse publicity, about real or perceived issues, as a result of business practices of Manulife or its representatives potentially causing long-term or even irreparable damage to the Company's franchise value. Reputation risk arises from both internal and external environmental factors, and cannot be managed in isolation from other risks, but only as an integral part of the Company's integrated risk management approach.

The Company's Reputation Risk Policy requires that internal processes and controls, management decisions, and business decisions, include considerations for how the Company's reputation and brand could be impacted. Any incident with the potential to harm our reputation is of high priority and senior management is to be alerted. An essential component of the Policy requires that all employees should conduct themselves in accordance with our values, as well as the Company's Code of Conduct and Business Ethics.

Environmental, Social and Governance Risks

Environmental, social and governance ("ESG") risks may impact our investments, underwriting, or operations, and may create financial, operational, legal, reputational, or brand value risks for Manulife.

The Board's Corporate Governance and Nominating Committee ("CGNC") oversees Manulife's ESG framework. Manulife's Executive Sustainability Council, which consists of members of the Executive Leadership Team and the Chief Sustainability Officer, is responsible for ESG-related strategy and disclosures. It meets monthly and provides quarterly updates to the CGNC. The Council is supported by a Sustainability Centre of Expertise that consists of representatives from multiple businesses and functional areas and includes a Climate Change Taskforce.

Please refer to our annual "Sustainability Report and Public Accountability Statement", typically published in the second quarter, of the following year, for information on our ESG priorities and performance.

Climate Risk

Matters related to climate change are a key component of the Environmental pillar of Manulife's ESG framework. Manulife supports the recommendations of the Financial Stability Board's Taskforce on Climate-Related Financial Disclosures ("TCFD"). The application of these recommendations is articulated below and is expected to be further refined over the coming years.

Consistent with TCFD, Manulife defines climate-related risk as the risk of loss, either directly through financial loss or indirectly through reputational damage, resulting from the inability or failure to adequately prepare for the impacts from climate change or the transition to a lower-carbon economy.

Climate-related risks can manifest through two dimensions – physical and transition risks. Physical risks include acute risks that are event-driven, such as extreme heat or cold, catastrophic storms, and floods. It also includes chronic risks which are longer-term shifts in climate patterns, such as rising global temperatures and sea levels. Transition risks include risks associated with transitioning to a lower-carbon economy and may entail extensive changes in policies, regulations, technologies, markets or consumer preferences to address mitigation and adaptation efforts.

We view climate-related risk as a transverse risk, since the broad range of actual or potential risks can impact any of our key risks (e.g. market, credit, product, operational, legal, and reputational) through the manifestation of physical and transition climate-related risks.

- **Governance** – The Board's CGNC oversees matters related to climate change as part of the oversight of the Manulife ESG framework. The Board Risk Committee also considers climate-related risks and opportunities through the ongoing monitoring and reporting of emerging risks.

Manulife's Executive Sustainability Council is responsible for the climate strategy, risk management, and disclosures. The Manulife Climate Change Taskforce which consists of representatives from multiple businesses and functional areas and is led by the Chief Sustainability Officer, drives the development of the climate strategy, risk management activities on climate-related matters, performance tracking, and disclosures.

- **Strategy** – Manulife is a long-term oriented underwriter and investor. Therefore, long-term climate-related risks and opportunities, including changes in the physical environment and policy and technological changes associated with the transition to a lower-carbon economy, are strategically relevant.

In 2020, we continued the climate-related risk identification process across businesses, geographies, and time horizons.

We performed a series of climate change stress tests to gain insight into the impact of climate-related risks on our investment portfolios and to inform capital management. In 2020, this included the Prudential Regulation Authority Scenario A climate stress test that models the immediate and sudden impact of disorderly economic transition to constraining the rise in temperature to less than +2°Celsius. Having stressed the general account assets with market value shocks ranging from +15% to -65% for various industrial sub-sectors, our capital levels remained well above the minimum regulatory capital requirements.

As of November 2020, Manulife is a founding participant in the joint Bank of Canada / Office of the Superintendent of Financial Institutions' pilot project that deploys climate-change scenarios to understand the risks to the financial system that stem from the transition to a low-carbon economy.

As part of Manulife's support for the transition to a lower carbon economy, as at December 31, 2019, \$14 billion, or 3.7% of General Account assets were invested into renewable energy and energy efficiency projects; 25.7 million square feet, or greater than 70% of our \$14.3 billion real estate portfolio was certified to sustainable building standards such as LEED, BOMA, and Energy Star; and the entire \$3.4 billion timberland portfolio was managed to third-party sustainability standards, including Forest Stewardship Council ("FSC") and Programme for the Endorsement of Forest Certification ("PEFC").

During 2020, our product and insurance risk management teams laid the foundational framework for research and analysis of the impacts of climate change, such as on vector-borne diseases (such as malaria), extreme weather events, and increased temperatures, on morbidity and/or mortality. The research along with experience data will help to inform decisions related to underwriting assumptions over the long-term.

The Property and Casualty Reinsurance business is annually priced and forms a smaller part of our underwriting portfolio. It may experience business risks associated with the increased frequency and severity of catastrophic weather events.

Finally, for our third-party asset management business, MIM tested a climate scenario risk tool jointly with industry peers convened by the United Nations' Environment Programme – Finance Initiative. We have identified this as a business opportunity in enabling clients to invest in decarbonization and we offer diversified investment funds with exposure to low-carbon opportunities.

- **Risk Management** – The identification and assessment of climate-related risks is communicated through an Environmental Risk Policy updated in 2020, which sets out an enterprise-wide framework for the management of environmental risks within our business activities. ESG Guidelines for the General Account assets and MIM's ESG Engagement Policy cover climate change risk factors in investment decision-making. For example, MIM's public markets team directly engages some of the world's largest emitters on climate-related risks and opportunities, as well as through the collaborative industry program Climate Action 100+.

We continue to enhance the integration of climate-related risk into our ERM framework to ensure that they are managed in a manner consistent with our common approach to risk management (refer to "Risk Identification, Measurement and Assessment" above).

- **Metrics** – Manulife reports its greenhouse gas emissions in our Annual Sustainability Report and to Carbon Disclosure Project ("CDP" – a global database of corporate carbon emissions). Disclosures include scope 1 and 2 emissions from businesses where Manulife has operational control, scope 3 emissions from business travel, cloud services, and landfill waste, and carbon removals from timberland and agriculture business. Emissions are calculated according to the Greenhouse Gas Protocol and are reviewed by a third-party using a limited assurance procedure.

In 2020, Manulife assessed the carbon emission profile of public equities, public corporate bonds, and sovereign bonds within the General Account investment portfolio. Using the carbon data and estimations available for 2019 and 2018 for individual equity securities from the third-party provider Trucost, the weighted average carbon intensity of the public equity portfolio was 216 tons of carbon dioxide equivalent per million Canadian dollars revenue.

As part of the ongoing refinements of Manulife's ESG framework, we are assessing other relevant climate risk-related metrics and targets.

Strategic Risk Factors

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

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

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

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

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

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

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

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

- Manulife's reputation is one of its most valuable assets. Harm to a company's reputation is often a consequence of risk control failure, whether associated with complex financial transactions or relatively routine operational activities. Manulife's reputation could also be harmed by the actions of third parties with whom we do business. Our representatives include affiliated broker-dealers, agents, wholesalers and independent distributors, such as broker-dealers and banks, whose services and representations our customers rely on. Business partners include, among others, joint venture partners and third parties to whom we outsource certain functions and that we rely on to fulfill various obligations.
- If any of these representatives or business partners fail to adequately perform their responsibilities, or monitor their own risks, these failures could affect our business reputation and operations. While we seek to maintain adequate internal risk management policies and procedures and protect against performance failures, events may occur involving our representatives or our business partners that could cause us to lose customers or cause us or our representatives or business partners to become subject to legal, regulatory, economic or trade sanctions, which could have a material adverse effect on our reputation, our business, and our results of operations. For further discussion of government regulation and legal proceedings refer to "Government Regulation" in MFC's Annual Information Form dated February 10, 2021 and note 18 of the Consolidated Financial Statements.

Our businesses are heavily regulated, and changes in regulation or laws, or in the interpretation or enforcement of regulation and laws, may reduce our profitability and limit our growth.

- Our operations are subject to a wide variety of insurance and other laws and regulations including with respect to financial crimes (which include, but are not limited to, money laundering, bribery and economic or trade sanctions), privacy, market conduct, consumer protection, business conduct, prudential and other generally applicable non-financial requirements. Insurance and securities regulators in Canada, the United States, Asia and other jurisdictions regularly re-examine existing laws and regulations applicable to insurance companies, investment advisors, brokers-dealers and their products. Compliance with applicable laws and regulations is time consuming and personnel-intensive, and changes in these laws and regulations or in the interpretation or enforcement thereof, may materially increase our direct and indirect compliance costs and other expenses of doing business, thus having a material adverse effect on our results of operations and financial condition.
- Regulators review their capital requirements and implement changes aimed at strengthening risk management and capitalization of financial institutions. Future regulatory capital, actuarial and accounting changes, including changes with a retroactive impact, could have a material adverse effect on the Company's consolidated financial condition, results of operations and regulatory capital both on transition and going forward. In addition, such changes could have a material adverse effect on the Company's position relative to that of other Canadian and international financial institutions with which Manulife competes for business and capital.
- In Canada, MFC and its principal operating subsidiary, MLI, are governed by the Insurance Companies Act (Canada) ("ICA"). The ICA is administered, and the activities of the Company are supervised, by the Office of the Superintendent of Financial Institutions ("OSFI"). MLI is also subject to regulation and supervision under the insurance laws of each of the provinces and territories of Canada. Regulatory oversight is vested in various governmental agencies having broad administrative power with respect to, among other things, dividend payments, capital adequacy and risk based capital requirements, asset and reserve valuation requirements, permitted investments and the sale and marketing of insurance contracts. These regulations are intended to protect policyholders and beneficiaries rather than investors and may adversely impact shareholder value.
- Some recent examples of regulatory and professional standard developments, in addition to the developments outlined in the "Risk Factors and Risk Management – Regulatory Updates" section below, which could impact our net income attributed to shareholders and/or capital position are provided below.

- At its annual meeting in November 2019, the International Association of Insurance Supervisors (“IAIS”) adopted its first global frameworks for supervision of internationally active insurance groups (“IAIGs”) and mitigation of systemic risk in the insurance sector. The frameworks were composed of three elements:
 - A Common Framework (“ComFrame”) provides supervisory standards and guidance focusing on the effective group-wide supervision of IAIGs. ComFrame builds on the revised set of Insurance Core Principles, that are applicable to the supervision of all insurers, and which were adopted after extensive review.
 - A risk based global Insurance Capital Standard (“ICS”) is being further developed over a five-year monitoring period which began in 2020. While broadly supportive of the goals of ICS, OSFI stated that they did not support the ICS design for the monitoring period, citing that it was ‘not fit for purpose for the Canadian market’. The adoption of the international rules in specific markets or on a group-based basis will depend on the decision of each applicable regulator.
 - The Holistic Framework for the assessment and mitigation of systemic risk in the insurance sector, which includes reviewing activities of insurers, was used beginning January 2020. At the same time, the Financial Standards Board announced it would be suspending designations of any IAIGs as Globally Systemically Important Insurers (G-SIIs) until at least November 2022 when it will re-assess whether designations are necessary.

Manulife is an IAIG but is not designated as a G-SII. Though the overall frameworks were adopted by the IAIS in 2019, much of the necessary details were expected to be developed in 2020 and beyond. In 2020, COVID-19 resulted in reprioritization of activities by regulators. This included pivoting review and data collection exercises under the Holistic Framework with IAIGs to focus on targeted assessment of COVID-19 impacts to the insurance sector and delayed other regulatory developments. The impact of the frameworks on capital and other regulatory requirements and Manulife’s competitive position remains unknown and is being monitored.

- The National Association of Insurance Commissioners (“NAIC”) has been reviewing reserving and capital methodologies as well as the overall risk management framework. These reviews will affect U.S. life insurers, including John Hancock, and could lead to increased reserving and/or capital requirements for our business in the U.S. In addition, in December 2020 the NAIC adopted a group capital calculation (“GCC”) and amendments to the NAIC Insurance Holding Company System Regulatory Act which exempt certain insurance holding groups, including John Hancock and Manulife, from the requirements relating to the GCC. Though the NAIC has adopted model laws and regulations, it remains up to individual states to enact their own specific laws and regulations.
- The Actuarial Standards Board (“ASB”) promulgates certain assumptions referenced in the CIA Standards of Practice for the valuation of insurance contract liabilities. These promulgations are updated periodically and, in the event that new promulgations are published, they will apply to the determination of actuarial liabilities and may lead to an increase in actuarial liabilities and a reduction in net income attributed to shareholders.
- In the United States, state insurance laws regulate most aspects of our business, and our U.S. insurance subsidiaries are regulated by the insurance departments of the states in which they are domiciled and the states in which they are licensed. State laws grant insurance regulatory authorities broad administrative powers with respect to, among other things: licensing companies and agents to transact business; calculating the value of assets to determine compliance with statutory requirements; mandating certain insurance benefits; regulating certain premium rates; reviewing and approving policy forms; regulating unfair trade and claims practices, including through the imposition of restrictions on marketing and sales practices, distribution arrangements and payment of inducements; regulating advertising; protecting privacy; establishing statutory capital and reserve requirements and solvency standards; fixing maximum interest rates on insurance policy loans and minimum rates for guaranteed crediting rates on life insurance policies and annuity contracts; approving changes in control of insurance companies; restricting the payment of dividends and other transactions between affiliates; and regulating the types, amounts and valuation of investments. Changes in any such laws and regulations, or in the interpretation or enforcement thereof by regulators, could significantly affect our business, results of operations and financial condition.
- Currently, the U.S. federal government does not directly regulate the business of insurance. However, federal legislation and administrative policies in several areas can significantly and adversely affect state regulated insurance companies. These areas include financial services regulation, securities regulation, pension regulation, privacy, tort reform legislation and taxation. In addition, under the Dodd-Frank Wall Street Reform and Consumer Protection Act (“Dodd-Frank”), the U.S. Board of Governors of the Federal Reserve has supervisory powers over non-bank financial companies that are determined to be systemically important.
- Insurance guaranty associations in Canada and the United States have the right to assess insurance companies doing business in their jurisdiction for funds to help pay the obligations of insolvent insurance companies to policyholders and claimants. Typically, an insurer is assessed an amount related to its proportionate share of the line of business written by all insurers in the relevant jurisdiction. Because the amount and timing of an assessment is beyond our control, the liabilities that we have currently established for these potential liabilities may not be adequate, particularly if there is an increase in the number of insolvent insurers or if the insolvent insurers operated in the same lines of business and in the same jurisdictions in which we operate.
- While many of the laws and regulations to which we are subject are intended to protect policyholders, beneficiaries, depositors and investors in our products and services, others also set standards and requirements for the governance of our operations. Failure to comply with applicable laws or regulations could result in financial penalties or sanctions, and damage our reputation.
- All aspects of Manulife’s Global Wealth and Asset Management businesses are subject to various laws and regulations around the world. These laws and regulations are primarily intended to protect investment advisory clients, investors in registered and unregistered funds, and clients of Manulife’s global retirement businesses. Agencies that regulate investment advisors, investment funds and retirement

plan products and services have broad administrative powers, including the power to limit, restrict or prohibit the regulated entity or person from carrying on business if it fails to comply with such laws and regulations. Possible sanctions for significant compliance failures include the suspension of individual employees, limitations on engaging in certain lines of business for specified periods of time, revocation of investment advisor and other registrations and censures and fines both for individuals and Manulife.

- From time to time, regulators raise issues during examinations or audits of Manulife that could have a material adverse impact on us. We cannot predict whether or when regulatory actions may be taken that could adversely affect our operations. Our failure to comply with existing and evolving regulatory requirements could also result in regulatory sanctions and could affect our relationships with regulatory authorities and our ability to execute our business strategies and plans. For further discussion of government regulation and legal proceedings refer to “Government Regulation” in MFC’s Annual Information Form dated February 10, 2021 and note 18 of the 2020 Annual Consolidated Financial Statements. Refer to the risk factor “Our operations face political, legal, operational and other risks that could negatively affect those operations or our results of operations and financial condition” for further discussion on the impact to our operations.

Changes to International Financial Reporting Standards could have a material impact on our financial results.

- New standards or modifications to existing standards could have a material adverse impact on our financial results and regulatory capital position (the regulatory capital framework in Canada uses IFRS as a base). Additionally, any mismatch between the underlying economics of our business and new accounting standards could have significant unintended negative consequences on our business model; and potentially affect our customers, shareholders and our access to capital markets. Please refer to “Emerging Risks – IFRS 17 and IFRS 9” below.

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

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

Access to capital may be negatively impacted by market conditions.

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

As a holding company, MFC depends on the ability of its subsidiaries to transfer funds to it to meet MFC’s obligations and pay dividends. Subsidiaries’ remittance of capital depends on subsidiaries’ earnings, regulatory requirements and restrictions, and macroeconomic conditions.

- MFC is a holding company and relies on dividends and interest payments from our insurance and other subsidiaries as the principal source of cash flow to meet MFC’s obligations and pay dividends. As a result, MFC’s cash flows and ability to service its obligations are

dependent upon the earnings of its subsidiaries and the distribution of those earnings and other funds by its subsidiaries to MFC. Substantially all of MFC's business is currently conducted through its subsidiaries.

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

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

- Credit rating agencies publish financial strength ratings on life insurance companies that are indicators of an insurance company's ability to meet contract holder and policyholder obligations. Credit rating agencies also assign credit ratings, which are indicators of an issuer's ability to meet the terms of its obligations in a timely manner and are important factors in a company's overall funding profile and ability to access external capital. Ratings reflect the views held by each credit agency, which are subject to change based on various factors that may be within or beyond a company's control.
- Ratings are important factors in establishing the competitive position of insurance companies, maintaining public confidence in products being offered, and determining the cost of capital. A ratings downgrade, or the potential for such a downgrade could adversely affect our operations and financial condition. A downgrade could, among other things, increase our cost of capital and limit our access to the capital and loan markets; cause some of our existing liabilities to be subject to acceleration, additional collateral support, changes in terms, or additional financial obligations; result in the termination of our relationships with broker-dealers, banks, agents, wholesalers and other distributors of our products and services; increase our cost of hedging; unfavourably impact our ability to execute on our hedging strategies; materially increase the number of surrenders, for all or a portion of the net cash values, by the owners of policies and contracts we have issued, impact our ability to obtain reinsurance at reasonable prices or at all, and materially increase the number of withdrawals by policyholders of cash values from their policies; and reduce new sales.

Competitive factors may adversely affect our market share and profitability.

- The insurance, wealth and asset management industries are highly competitive. Our competitors include other insurers, securities firms, investment advisors, mutual funds, banks and other financial institutions. The rapid advancement of new technologies, such as blockchain, artificial intelligence and advanced analytics, may enable other non-traditional firms to compete directly in the industry space, or offer services to our traditional competitors to enhance their value propositions. The impact from technological disruption may result in our competitors improving their customer experience, product offerings and business costs. Our competitors compete with us for customers, access to distribution channels such as brokers and independent agents, and for employees. In some cases, competitors may be subject to less onerous regulatory requirements, have lower operating costs or have the ability to absorb greater risk while maintaining their financial strength ratings, thereby allowing them to price their products more competitively or offer features

that make their products more attractive. These competitive pressures could result in lower new business volumes and increased pricing pressures on a number of our products and services that may harm our ability to maintain or increase our profitability. Due to the highly competitive nature of the financial services industry, there can be no assurance that we will continue to effectively compete with our traditional and non-traditional industry rivals, and competitive pressure may have a material adverse effect on our business, results of operations and financial condition.

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

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

Industry trends could adversely affect the profitability of our businesses.

- Our business segments continue to be influenced by a variety of trends that affect our business and the financial services industry in general. The impact of the volatility and instability of the financial markets on our business is difficult to predict and the results of operations and our financial condition may be significantly impacted by general business and economic trends in the geographies in which we operate. These conditions include, but are not limited to, market factors, such as public equity, foreign currency, interest rate and other market risks, demographic shifts, consumer behaviours (e.g. spending habits and debt levels), and governmental policies (e.g. fiscal, monetary, and global trade). The Company's business plans, results of operations, and financial condition have been negatively impacted in the recent past and may also be negatively affected in the future.

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

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

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

- Goodwill represents the excess of the amounts we paid to acquire subsidiaries and other businesses over the fair value of their net identifiable assets at the date of acquisition. Intangible assets represent assets that are separately identifiable at the time of an acquisition and provide future benefits such as the John Hancock brand.
- As outlined below under "Critical Actuarial and Accounting Policies - Goodwill and Intangible Assets", goodwill and intangible assets with indefinite lives are tested at least annually for impairment at the cash generating unit ("CGU") or group of CGUs level, representing the smallest group of assets that is capable of generating largely independent cash flows. Going forward, as a result of the impact of economic conditions and changes in product mix and the granular level of goodwill testing under IFRS, additional impairment charges could occur in the future. Any impairment in goodwill would not affect LICAT capital.
- If market conditions deteriorate in the future and, in particular, if MFC's common share price is low relative to book value per share, if the Company's actions to limit risk associated with its products or investments cause a significant change in any one CGU's recoverable amount, or if the outlook for a CGU's results deteriorate, the Company may need to reassess the value of goodwill and/or intangible assets which could result in impairments during 2021 or subsequent periods. Such impairments could have a material adverse effect on our results of operations and financial condition.
- Deferred income tax balances represent the expected future tax effects of the differences between the book and tax basis of assets and liabilities, loss carry forwards and tax credits. Deferred tax assets are recorded when the Company expects to claim deductions on tax returns in the future for expenses that have already been recorded in the financial statements.

- The availability of those deductions is dependent on future taxable income against which the deductions can be made. Deferred tax assets are assessed periodically by management to determine if they are realizable. Factors in management's determination include the performance of the business including the ability to generate gains from a variety of sources and tax planning strategies. If based on information available at the time of the assessment, it is determined that the deferred tax asset will not be realized, then the deferred tax asset is reduced to the extent that it is no longer probable that the tax benefit will be realized.

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

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

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

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

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

- MFC operates in local markets through subsidiaries and branches of subsidiaries. These local operations are financially and operationally interconnected to lessen expenses, share and reduce risk, and efficiently utilize financial resources. In general, external capital required for companies in the Manulife group has been raised at the MFC level in recent years and then transferred to other entities as equity or debt capital as appropriate. Other linkages include policyholder and other creditor guarantees and other forms of internal support between various entities, loans, capital maintenance agreements, derivatives, shared services and affiliate reinsurance treaties. Accordingly, the risks undertaken by a subsidiary may be transferred to or shared by affiliates through financial and operational linkages. Some of the consequences of this are:
 - Financial difficulties at a subsidiary may not be isolated and could cause material adverse effects on affiliates and the group as a whole.
 - Linkages may make it difficult to dispose of or separate a subsidiary or business within the group by way of a spin-off or similar transaction and the disposition or separation of a subsidiary or business may not fully eliminate the liability of the Company and its remaining subsidiaries for shared risks. Issues raised by such a transaction could include: (i) the Company cannot terminate, without policyholder consent and in certain jurisdictions regulator consent, parental guarantees on in-force policies and therefore would continue to have residual risk under any such non-terminated guarantees; (ii) internal capital mobility and efficiency could be limited; (iii) significant potential tax consequences; (iv) uncertainty about the accounting and regulatory outcomes of such a transaction; (v) obtaining any other required approvals; (vi) there may be a requirement for significant capital injections; and (vii) the transaction may result in increased sensitivity of net income attributed to shareholders and capital of MFC and its remaining subsidiaries to market declines.

Market Risk

Market risk is the risk of loss resulting from market price volatility, interest rate change, credit and swap spread changes, and adverse foreign exchange rate movements. Market price volatility primarily relates to changes in prices of publicly traded equities and alternative long-duration assets. The profitability of our insurance and annuity products, as well as the fees we earn in our investment management business, are subject to market risk.

Please read below for details on factors that could impact our level of market risk and the strategies used to manage this risk:

IFRS 7 Disclosures

Text and tables in this and the following section (“Market Risk Sensitivities and Market Risk Exposure Measures”) include disclosures on market and liquidity risk in accordance with IFRS 7, “Financial Instruments – Disclosures”, and discussions on how we measure risk and our objectives, policies and methodologies for managing them. Disclosures in accordance with IFRS 7 are identified by a vertical line in the left margin of each page. The identified text and tables represent an integral part of our audited annual Consolidated Financial Statements for the years ended December 31, 2020 and December 31, 2019. The fact that certain text and tables are considered an integral part of the Consolidated Financial Statements does not imply that the disclosures are of any greater importance than the sections not part of the disclosure. Accordingly, the “Risk Factors and Risk Management” disclosure should be read in its entirety.

Market Risk Management Strategy

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

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

Risk Management Strategy

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

Publicly Traded Equity Performance Risk – To manage publicly traded equity performance risk from our insurance and annuity businesses, we primarily use a variable annuity guarantee dynamic hedging strategy which is complemented by a general macro equity risk hedging strategy, in addition to asset liability management strategies. Our strategies employed for variable annuity guarantee dynamic hedging and macro equity risk hedging expose the Company to additional risks.

Interest Rate and Spread Risk – To manage interest rate and spread risk, we primarily employ asset liability management strategies to manage the duration of our fixed income investments and execute interest rate hedges in our insurance segments and our Corporate and Other segments.

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

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

Liquidity Risk - We are exposed to liquidity risk, which is the risk of not having access to sufficient funds or liquid assets to meet both expected and unexpected cash outflows and collateral demands in our operating and holding companies. In the operating companies, cash and collateral demands arise day-to-day to fund policyholder benefits, withdrawals of customer deposit balances, reinsurance settlements, derivative instrument settlements/collateral pledging, expenses, and investment and hedging activities. Under stressed conditions, additional cash and collateral demands could arise primarily from changes to policyholder termination or policy renewal rates, withdrawals of customer deposit balances, borrowers renewing or extending their loans when they mature, derivative settlements or collateral demands, and reinsurance settlements.

Our liquidity risk management framework is designed to provide adequate liquidity to cover cash and collateral obligations as they come due, and to sustain and grow operations in both normal and stressed conditions. Refer to “Liquidity Risk Management Strategy” below for more information.

Product Design and Pricing Strategy

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

Hedging Strategies for Variable Annuity and Other Equity Risks

The Company's exposure to movement in public equity market values primarily arises from insurance liabilities related to variable annuity guarantees and general account public equity investments.

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

We seek to manage public equity risk arising from unhedged exposures in our insurance liabilities through our macro equity risk hedging strategy. We seek to manage interest rate risk arising from variable annuity business not dynamically hedged through our asset liability management strategy.

Variable Annuity Dynamic Hedging Strategy

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

Our variable annuity hedging program uses a variety of exchange-traded and over-the-counter (OTC) derivative contracts to offset the change in value of variable annuity guarantees. The main derivative instruments used are equity index futures, government bond futures, currency futures, interest rate swaps, total return swaps, equity options and interest rate swaptions. The hedge instruments' positions against policy liabilities are continuously monitored as market conditions change. As necessary, the hedge asset positions will be dynamically rebalanced in order to stay within established limits. We may also utilize other derivatives with the objective to improve hedge effectiveness opportunistically.

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

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

Macro Equity Risk Hedging Strategy

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

- Residual equity and currency exposure from variable annuity guarantees not dynamically hedged;
- General fund equity holdings backing guaranteed, adjustable liabilities and variable universal life; and
- Unhedged provisions for adverse deviation related to variable annuity guarantees dynamically hedged.

Asset Liability Management Strategy

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

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

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

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

We seek to manage the assets backing these long-dated benefits to achieve a target return sufficient to support the obligations over their lifetime, subject to established risk tolerances and the impact of regulatory and economic capital requirements. Fixed income assets are managed to a benchmark developed to minimize interest rate risk against the liability cash flows. Utilizing ALDA and public equity investments provides a suitable match for long-duration liabilities that also enhances long-term investment returns and reduces aggregate risk through diversification.

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

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

Foreign Exchange Risk Management Strategy

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

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

Liquidity Risk Management Strategy

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

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

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

As at December 31, 2020, the Company held \$262.9 billion in cash & cash equivalents, comprised of cash on deposit, Canadian and U.S. Treasury Bills and high quality short-term investments, and marketable assets comprised of investment grade government and agency bonds, investment grade corporate bonds, investment grade securitized instruments, publicly traded common stocks and preferred shares, compared with \$236.7 billion as at December 31, 2019 as noted in the table below.

As at December 31,
(\$ millions, unless otherwise stated)

	2020	2019
Cash and cash equivalents	\$ 26,167	\$ 20,300
Marketable assets		
Government bonds (investment grade)	79,511	72,125
Corporate bonds (investment grade)	131,930	119,648
Securitized — ABS, CMBS, RMBS (investment grade)	2,989	3,437
Public equities	22,294	21,190
Total marketable assets	236,724	216,400
Total cash and cash equivalents and marketable assets⁽¹⁾	\$ 262,891	\$ 236,700

⁽¹⁾ Including \$6.8 billion encumbered cash and cash equivalents and marketable assets as at December 31, 2020 (compared to \$5.1 billion as at December 31, 2019).

We have established a variety of contingent liquidity sources. These include a \$500 million committed unsecured revolving credit facility with certain Canadian chartered banks available for MFC, a US\$500 million committed unsecured revolving credit facility with certain U.S. banks available for MFC and certain of its U.S. subsidiaries, and the Contingent Term Repo Facility with the Bank of Canada. There were no outstanding borrowings under these facilities as of December 31, 2020. In addition, John Hancock Life Insurance Company (U.S.A.) (“JHUSA”) is a member of the Federal Home Loan Bank of Indianapolis (“FHLBI”), which enables the company to obtain loans from FHLBI as an alternative source of liquidity that is collateralizable by qualifying mortgage loans, mortgage-backed securities and U.S. Treasury and Agency securities. As of December 31, 2020, JHUSA had an estimated maximum borrowing capacity of US\$4.8 billion based on regulatory limitations with an outstanding balance of US\$500 million, under the FHLBI facility.

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

Maturity of financial liabilities⁽¹⁾

As at December 31, 2020 (\$ millions)	Less than 1 year	1 to 3 years	3 to 5 years	Over 5 years	Total
Long-term debt	\$ –	\$ –	\$ –	\$ 6,164	\$ 6,164
Capital instruments	350	–	584	6,895	7,829
Derivatives	386	250	555	13,771	14,962
Deposits from bank clients ⁽²⁾	16,783	2,591	1,515	–	20,889
Lease liabilities	116	115	47	75	353

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

⁽²⁾ Carrying value and fair value of deposits from Bank clients as at December 31, 2020 was \$20,889 million and \$21,085 million, respectively (2019 – \$21,488 million and \$21,563 million, respectively). Fair value is determined by discounting contractual cash flows, using market interest rates currently offered for deposits with similar terms and conditions. All deposits from Bank clients were categorized in Level 2 of the fair value hierarchy (2019 – Level 2).

Through the normal course of business, pledging of assets is required to comply with jurisdictional regulatory and other requirements including collateral pledged to partially mitigate derivative counterparty credit risk, assets pledged to exchanges as initial margin and assets held as collateral for repurchase funding agreements. Total unencumbered assets were \$496.8 billion as at December 31, 2020 (2019 – \$455.2 billion).

Market Risk Sensitivities and Market Risk Exposure Measures

Variable Annuity and Segregated Fund Guarantees Sensitivities and Risk Exposure Measures

Guarantees on variable annuity products and segregated funds may include one or more of death, maturity, income and withdrawal guarantees. Variable annuity and segregated fund guarantees are contingent and only payable upon the occurrence of the relevant event, if fund values at that time are below guaranteed values. Depending on future equity market levels, liabilities on current in-force business would be due primarily in the period from 2021 to 2041.

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

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

Variable annuity and segregated fund guarantees, net of reinsurance

As at December 31, (\$ millions)	2020			2019		
	Guarantee value	Fund value	Amount at risk ^{(3),(4)}	Guarantee value	Fund value	Amount at risk ^{(3),(4)}
Guaranteed minimum income benefit	\$ 4,277	\$ 3,642	\$ 837	\$ 4,629	\$ 3,696	\$ 998
Guaranteed minimum withdrawal benefit	49,698	44,831	5,962	53,355	48,031	6,030
Guaranteed minimum accumulation benefit	18,436	18,918	8	17,994	18,362	10
Gross living benefits ⁽¹⁾	72,411	67,391	6,807	75,978	70,089	7,038
Gross death benefits ⁽²⁾	8,968	18,819	689	9,555	17,186	802
Total gross of reinsurance	81,379	86,210	7,496	85,533	87,275	7,840
Living benefits reinsured	3,672	3,157	694	3,977	3,199	832
Death benefits reinsured	677	534	282	718	500	318
Total reinsured	4,349	3,691	976	4,695	3,699	1,150
Total, net of reinsurance	\$ 77,030	\$ 82,519	\$ 6,520	\$ 80,838	\$ 83,576	\$ 6,690

⁽¹⁾ Where a policy includes both living and death benefits, the guarantee in excess of the living benefit is included in the death benefit category as outlined in footnote 2.

⁽²⁾ Death benefits include standalone guarantees and guarantees in excess of living benefit guarantees where both death and living benefits are provided on a policy.

⁽³⁾ Amount at risk (in-the-money amount) is the excess of guarantee values over fund values on all policies where the guarantee value exceeds the fund value and assumes that all claims are immediately payable. For guaranteed minimum death benefit, the amount at risk is defined as the current guaranteed minimum death benefit in excess of the current account balance. In practice, guaranteed death benefits are contingent and only payable upon the eventual death of policyholders if fund values remain below guarantee values. For guaranteed minimum withdrawal benefit, the amount at risk simplistically assumes that the benefit is paid as a lump sum based on the withdrawal benefit guarantee value and does not recognize that actual claims on this business will instead be paid as a lifetime annuity stream. Adjusting for the time value of money, the net amount at risk will be lower than presented. These benefits are also contingent and only payable at scheduled maturity/income start dates in the future, if the policyholders are still living and have not terminated their policies and fund values remain below guarantee values. For all guarantees, the amount at risk is floored at zero at the single contract level.

⁽⁴⁾ The amount at risk net of reinsurance at December 31, 2020 was \$6,520 million (2019 – \$6,690 million) of which: US\$4,182 million (2019 – US\$3,995 million) was on our U.S. business, \$964 million (2019 – \$1,178 million) was on our Canadian business, US\$71 million (2019 – US\$104 million) was on our Japan business and US\$111 million (2019 – US\$145 million) was related to Asia (other than Japan) and our run-off reinsurance business.

Investment categories for variable contracts with guarantees

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

As at December 31,

(\$ millions)

Investment category	2020	2019
Equity funds	\$ 47,348	\$ 47,489
Balanced funds	42,414	42,448
Bond funds	11,944	11,967
Money market funds	2,113	1,732
Other fixed interest rate investments	1,992	1,975
Total	\$ 105,811	\$ 105,611

Caution Related to Sensitivities

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

Publicly Traded Equity Performance Risk Sensitivities and Exposure Measures

As outlined above, we have net exposure to equity risk through asset and liability mismatches; our variable annuity guarantee dynamic hedging strategy is not designed to completely offset the sensitivity of policy liabilities to all risks associated with the guarantees embedded in these products. The macro hedging strategy is designed to mitigate public equity risk arising from variable annuity guarantees not dynamically hedged and from other unhedged exposures in our insurance liabilities.

Changes in public equity prices may impact other items including, but not limited to, asset-based fees earned on assets under management and administration or policyholder account value, and estimated profits and amortization of deferred policy acquisition and other costs. These items are not hedged.

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

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

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

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

Potential immediate impact on net income attributed to shareholders arising from changes to public equity returns^{(1),(2),(3)}

As at December 31, 2020

(\$ millions)	-30%	-20%	-10%	+10%	+20%	+30%
Underlying sensitivity to net income attributed to shareholders⁽⁴⁾						
Variable annuity guarantees	\$ (3,150)	\$ (1,850)	\$ (800)	\$ 600	\$ 1,040	\$ 1,350
General fund equity investments ⁽⁵⁾	(1,350)	(840)	(410)	380	760	1,130
Total underlying sensitivity before hedging	(4,500)	(2,690)	(1,210)	980	1,800	2,480
Impact of macro and dynamic hedge assets ⁽⁶⁾	2,420	1,410	600	(620)	(1,110)	(1,480)
Net potential impact on net income attributed to shareholders after impact of hedging	\$ (2,080)	\$ (1,280)	\$ (610)	\$ 360	\$ 690	\$ 1,000

As at December 31, 2019

(\$ millions)	-30%	-20%	-10%	+10%	+20%	+30%
Underlying sensitivity to net income attributed to shareholders⁽⁴⁾						
Variable annuity guarantees	\$ (3,270)	\$ (1,930)	\$ (860)	\$ 620	\$ 1,060	\$ 1,360
General fund equity investments ⁽⁵⁾	(1,140)	(720)	(330)	340	680	1,020
Total underlying sensitivity before hedging	(4,410)	(2,650)	(1,190)	960	1,740	2,380
Impact of macro and dynamic hedge assets ⁽⁶⁾	2,690	1,580	670	(580)	(1,020)	(1,340)
Net potential impact on net income attributed to shareholders after impact of hedging	\$ (1,720)	\$ (1,070)	\$ (520)	\$ 380	\$ 720	\$ 1,040

⁽¹⁾ See "Caution Related to Sensitivities" above.

⁽²⁾ The tables above show the potential impact on net income attributed to shareholders resulting from an immediate 10%, 20% and 30% change in market values of publicly traded equities followed by a return to the expected level of growth assumed in the valuation of policy liabilities, excluding impacts from asset-based fees earned on assets under management and policyholder account value.

⁽³⁾ Please refer to "Sensitivity of Earnings to Changes in Assumptions" section below for more information on the level of growth assumed and on the net income sensitivity to changes in these long-term assumptions.

⁽⁴⁾ Defined as earnings sensitivity to a change in public equity markets including settlements on reinsurance contracts, but before the offset of hedge assets or other risk mitigants.

⁽⁵⁾ This impact for general fund equity investments includes general fund investments supporting our policy liabilities, investment in seed money investments (in segregated and mutual funds made by Corporate and Other segment) and the impact on policy liabilities related to the projected future fee income on variable universal life and other unit linked products. The impact does not include: (i) any potential impact on public equity weightings; (ii) any gains or losses on AFS public equities held in the Corporate and Other segment; or (iii) any gains or losses on public equity investments held in Manulife Bank. The participating policy funds are largely self-supporting and generate no material impact on net income attributed to shareholders as a result of changes in equity markets.

⁽⁶⁾ Includes the impact of rebalancing equity hedges in the macro and dynamic hedging program. The impact of dynamic hedge rebalancing represents the impact of rebalancing equity hedges for dynamically hedged variable annuity guarantee best estimate liabilities at 5% intervals but does not include any impact in respect of other sources of hedge ineffectiveness (e.g. fund tracking, realized volatility and equity, interest rate correlations different from expected among other factors).

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

Potential immediate impact on MLI's LICAT total ratio arising from public equity returns different than the expected returns assumed in the valuation of policy liabilities^{(1),(2),(3)}

Percentage points	Impact on MLI's LICAT total ratio					
	-30%	-20%	-10%	+10%	+20%	+30%
December 31, 2020	(3)	(1)	(1)	-	-	(1)
December 31, 2019	(5)	(3)	(1)	1	4	5

⁽¹⁾ See "Caution Related to Sensitivities" above. In addition, estimates exclude changes to the net actuarial gains/losses with respect to the Company's pension obligations as a result of changes in equity markets, as the impact on the quoted sensitivities is not considered to be material.

⁽²⁾ The potential impact is shown assuming that the change in value of the hedge assets does not completely offset the change in the dynamically hedged variable annuity guarantee liabilities. The estimated amount that would not be completely offset relates to our practices of not hedging the provisions for adverse deviation and of rebalancing equity hedges for dynamically hedged variable annuity liabilities at 5% intervals.

⁽³⁾ OSFI rules for segregated fund guarantees reflect full capital impacts of shocks over 20 quarters within a prescribed range. As such, the deterioration in equity markets could lead to further increases in capital requirements after the initial shock.

Interest Rate and Spread Risk Sensitivities and Exposure Measures

At December 31, 2020, we estimated the sensitivity of our net income attributed to shareholders to a 50 basis point parallel decline in interest rates to be neutral, and to a 50 basis point parallel increase in interest rates to be a charge of \$100 million.

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

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

The interest rate and spread risk sensitivities are determined in isolation of each other and therefore do not reflect the combined impact of changes in government rates and credit spreads between government, swap and corporate rates occurring simultaneously. As a result, the impact of the summation of each individual sensitivity may be materially different from the impact of sensitivities to simultaneous changes in interest rate and spread risk.

The potential impact on net income attributed to shareholders does not take into account any future potential changes to our URR assumptions or calibration criteria for stochastic risk-free rates. At December 31, 2020, we estimated the sensitivity of our net income attributed to shareholders to a 10 basis point reduction in the URR in all geographies, and a corresponding change to stochastic risk-free modeling, to be a charge of \$350 million (post-tax); and note that the impact of changes to the URR are not linear. The long-term URR for risk-free rates in Canada is prescribed at 3.05% and we use the same assumption for the U.S. Our assumption for Japan is 1.6%. The ASB is currently conducting another review of the URR with any changes expected to be announced and implemented in 2021.

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

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

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

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

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

As at December 31,	2020		2019	
	-50bp	+50bp	-50bp	+50bp
Net income attributed to shareholders (\$ millions)				
Excluding change in market value of AFS fixed income assets held in the Corporate and Other segment	\$ nil	\$ (100)	\$ (100)	\$ (100)
From fair value changes in AFS fixed income assets held in the Corporate and Other segment, if realized	2,100	(1,900)	1,700	(1,600)
MLI's LICAT total ratio (Percentage points)				
LICAT total ratio change in percentage points ⁽⁵⁾	8	(7)	4	(4)

⁽¹⁾ See “Caution Related to Sensitivities” above. In addition, estimates exclude changes to the net actuarial gains/losses with respect to the Company's pension obligations as a result of changes in interest rates, as the impact on the quoted sensitivities is not considered to be material.

⁽²⁾ Includes guaranteed insurance and annuity products, including variable annuity contracts as well as adjustable benefit products where benefits are generally adjusted as interest rates and investment returns change, a portion of which have minimum credited rate guarantees. For adjustable benefit products subject to minimum rate guarantees, the sensitivities are based on the assumption that credited rates will be floored at the minimum.

⁽³⁾ The amount of gain or loss that can be realized on AFS fixed income assets held in the Corporate and Other segment will depend on the aggregate amount of unrealized gain or loss.

⁽⁴⁾ Sensitivities are based on projected asset and liability cash flows and the impact of realizing fair value changes in AFS fixed income is based on the holdings at the end of the period.

⁽⁵⁾ LICAT impacts include realized and unrealized fair value changes in AFS fixed income assets. LICAT impacts do not reflect the impact of the scenario switch discussed below.

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

Potential impact on net income attributed to shareholders and MLI's LICAT total ratio arising from changes to corporate spreads and swap spreads relative to spreads assumed in the valuation of policy liabilities^{(1),(2),(3)}

Corporate spreads^{(4),(5)}

As at December 31,	2020		2019	
	-50bp	+50bp	-50bp	+50bp
Net income attributed to shareholders (\$ millions)	\$ (1,000)	\$ 900	\$ (800)	\$ 800
MLI's LICAT total ratio (change in percentage points) ⁽⁶⁾	(4)	4	(7)	5

Swap spreads

As at December 31,	2020		2019	
	-20bp	+20bp	-20bp	+20bp
Net income attributed to shareholders (\$ millions)	\$ nil	\$ nil	\$ 100	\$ (100)
MLI's LICAT total ratio (change in percentage points) ⁽⁶⁾	nil	nil	nil	nil

⁽¹⁾ See "Caution Related to Sensitivities" above.

⁽²⁾ The impact on net income attributed to shareholders assumes no gains or losses are realized on our AFS fixed income assets held in the Corporate and Other segment and excludes the impact of changes in segregated fund bond values due to changes in credit spreads. The participating policy funds are largely self-supporting and generate no material impact on net income attributed to shareholders as a result of changes in corporate and swap spreads.

⁽³⁾ Sensitivities are based on projected asset and liability cash flows.

⁽⁴⁾ Corporate spreads are assumed to grade to the long-term average over five years.

⁽⁵⁾ As the sensitivity to a 50 basis point decline in corporate spreads includes the impact of a change in deterministic reinvestment scenarios where applicable, the impact of changes to corporate spreads for less than, or more than, the amounts indicated are unlikely to be linear.

⁽⁶⁾ LICAT impacts include realized and unrealized fair value change in AFS fixed income assets. Under LICAT, spread movements are determined from a selection of investment grade bond indices with BBB and better bonds for each jurisdiction. For LICAT, we use the following indices: FTSE TMX Canada All Corporate Bond Index, Barclays USD Liquid Investment Grade Corporate Index, and Nomura-BPI (Japan). LICAT impacts presented for corporate spreads do not reflect the impact of the scenario switch discussed below.

Swap spreads remain at low levels, and if they were to rise, this could generate material charges to net income attributed to shareholders.

LICAT Scenario Switch

Typically, a reduction in interest rates improves LICAT capital ratios and vice-versa. However, when interest rates decline past a certain threshold, reflecting the combined movement in risk-free rates and corporate spreads, a different prescribed interest rate stress scenario needs to be taken into account in the LICAT ratio calculation in accordance with OSFI guidelines for LICAT.

The LICAT guideline specifies four stress scenarios for interest rates and prescribes the methodology to determine the most adverse scenario to apply for each LICAT geographic region¹ based on current market inputs and the Company's balance sheet.

We estimate the potential impact of a switch in the scenarios would be approximately a one-time six percentage point decrease in MLI's total LICAT ratio. Should a scenario switch be triggered in a LICAT geographic region, the full impact would be reflected immediately for non-participating products while the impact for participating products would be reflected over six quarters using a rolling average of interest rate risk capital, in line with the smoothing approach prescribed in the OSFI Advisory effective January 1, 2021.

The potential negative impact of a switch in scenarios is not reflected in the stated risk-free rate and corporate spread sensitivities, as it is a one-time impact. After this one-time event, further decreases in risk-free interest rates would continue to improve the LICAT capital position, similar to the sensitivity above.

The level of interest rates and corporate spreads that would trigger a switch in the scenarios is dependent on market conditions and movements in the Company's asset and liability position. The scenario switch, if triggered, could reverse in response to subsequent increases in interest rates and/or corporate spreads.

Alternative Long-Duration Asset Performance Risk Sensitivities and Exposure Measures

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

¹ LICAT geographic locations include North America, the United Kingdom, Europe, Japan, and Other Region.

Potential impact on net income attributed to shareholders and MLI LICAT arising from changes in ALDA returns relative to returns assumed in the valuation of policy liabilities^{(1),(2),(3),(4),(5),(6)}

As at December 31, (\$ millions)	2020		2019	
	-10%	+10%	-10%	+10%
Net income attributed to shareholders				
Real estate, agriculture and timber assets	\$ (1,600)	\$ 1,400	\$ (1,300)	\$ 1,200
Private equities and other ALDA	(2,000)	1,900	(1,800)	1,700
Total	\$ (3,600)	\$ 3,300	\$ (3,100)	\$ 2,900
MLI's LICAT total ratio (change in percentage points)	(5)	4	(5)	4

⁽¹⁾ See "Caution Related to Sensitivities" above.

⁽²⁾ This impact is calculated as at a point-in-time impact and does not include: (i) any potential impact on ALDA weightings or (ii) any gains or losses on ALDA held in the Corporate and Other segment.

⁽³⁾ The participating policy funds are largely self-supporting and generate no material impact on net income attributed to shareholders as a result of changes in ALDA returns. For some classes of ALDA, where there is not an appropriate long-term benchmark available, the return assumptions used in valuation are not permitted by the Standards of Practice and CIA guidance to result in a lower reserve than an assumption based on a historical return benchmark for public equities in the same jurisdiction.

⁽⁴⁾ Net income impact does not consider any impact of the market correction on assumed future return assumptions.

⁽⁵⁾ Please refer to "Sensitivity of Earnings to Changes in Assumptions" section below for more information on the level of growth assumed and on the net income sensitivity to changes in these long-term assumptions.

⁽⁶⁾ The impact of changes to the portfolio asset mix supporting our North American legacy businesses are reflected in the sensitivities when the changes take place.

Foreign Exchange Risk Sensitivities and Exposure Measures

We generally match the currency of our assets with the currency of the insurance and investment contract liabilities they support, with the objective of mitigating risk of loss arising from foreign exchange rate changes. As at December 31, 2020, we did not have a material unmatched currency exposure.

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

Potential impact on core earnings of changes in foreign exchange rates^{(1),(2)}

As at December 31, (\$ millions)	2020		2019	
	+10% strengthening	-10% weakening	+10% strengthening	-10% weakening
10% change in the Canadian dollar relative to the U.S. dollar and the Hong Kong dollar	\$ (390)	\$ 390	\$ (360)	\$ 360
10% change in the Canadian dollar relative to the Japanese yen	(40)	40	(50)	50

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

⁽²⁾ See "Caution Related to Sensitivities" above.

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

Liquidity Risk Exposure Strategy

We manage liquidity levels of the consolidated group and key subsidiaries against established thresholds. These thresholds are based on liquidity stress scenarios over different time horizons.

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

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

Similarly, Global Wealth and Asset Management has a standalone liquidity risk management framework for the business managing assets or manufacturing investment products for third-party clients. We maintain fiduciary standards to ensure that client and regulatory expectations are met in relation to the liquidity risks taken within each investment. Additionally, we regularly monitor and review the liquidity of our mutual funds and investment products as part of our ongoing risk management practices.

Market Risk Factors

Our most significant source of publicly traded equity risk arises from equity-linked products with guarantees, where the guarantees are linked to the performance of the underlying funds.

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

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

- Interest rate and spread risk arises from general fund guaranteed benefit products, general fund adjustable benefit products with minimum rate guarantees, general fund products with guaranteed surrender values, segregated fund products with minimum benefit guarantees and from surplus fixed income investments. The risk arises within the general fund primarily due to the uncertainty of future returns on investments to be made as assets mature and as recurring premiums are received and invested or reinvested to support longer dated liabilities. Interest rate risk also arises due to minimum rate guarantees and guaranteed surrender values on products where investment returns are generally passed through to policyholders. A rapid rise in interest rates may also result in losses attributable to early liquidation of fixed income instruments supporting contractual surrender benefits, if customers surrender to take advantage of higher interest rates on offer elsewhere. In contrast, in a lower interest rate environment, borrowers may prepay or redeem fixed income securities, mortgages and loans with greater frequency in order to borrow at lower market rates, potentially reducing the returns on our investment portfolio, if there are no make whole conditions. Substantially all our fixed income securities, mortgages and loans portfolio include make whole conditions.
- The valuation of policy liabilities reflects assumptions for the yield on future investments and the projected cash flows associated with interest rate hedges. A general decline in interest rates, without a change in corporate bond spreads and swap spreads, will reduce the assumed yield on future investments but favourably impact the value of lengthening interest rate hedges. Conversely, a general increase in interest rates, without a change in corporate bond spreads and swap spreads, will increase the assumed yield on future investments, but unfavourably impact the value of lengthening interest rate hedges. The Company's disclosed estimated impact from interest rate movements reflects a parallel increase and decrease in interest rates of specific amounts. The impact from non-parallel movements may be different from the estimated impact of parallel movements. For further information on interest rate scenarios refer to "Interest Rate and Spread Risk Sensitivities and Exposure Measures". In addition, decreases in corporate bond spreads or increases in swap spreads should generally result in an increase in policy liabilities and a reduction in net income attributed to shareholders, while an increase in corporate bond spreads or a decrease in swap spreads should generally have the opposite impact. The impact of changes in interest rates and in spreads may be partially offset by changes to credited rates on adjustable products that pass-through investment returns to policyholders.

- For segregated fund and variable annuity products that contain investment guarantees in the form of benefit guarantees, a sustained increase in interest rate volatility or a decline in interest rates would increase the costs of hedging the benefit guarantees provided. The impact of changes in interest rates are managed within the Variable Annuity dynamic hedging program.

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

- ALDA performance risk arises from general fund investments in directly-owned real estate, timber properties, farmland properties, infrastructure, oil and gas properties, and private equities.
- Where these assets are used to support policy liabilities, the policy valuation incorporates projected investment returns on these assets. ALDA assumptions vary by asset class and generally have a similar impact on policy liabilities as public equities would. If actual returns are lower than the expected returns, there will be a negative impact to the net income attributed to shareholders. A reduction in the outlook for expected future returns for ALDA, which could result from a variety of factors such as a fundamental change in future expected economic growth or declining risk premiums due to increased competition for such assets, would increase policy liabilities and reduce net income attributed to shareholders. Further, if returns on certain external asset benchmarks used to determine permissible assumed returns under the CIA Standards of Practice are lower than expected, expected future returns will be adjusted accordingly and the Company's policy liabilities will increase, reducing net income attributed to shareholders.
- The value of oil and gas assets could be adversely affected by declines in energy prices as well as by a number of other factors including production declines, uncertainties associated with estimating oil and natural gas reserves, difficult economic conditions, changes in consumer preferences to transition to a lower carbon economy, competition from renewable energy providers and geopolitical events. Changes in government regulation of the oil and gas industry, including environmental regulation, carbon taxes and changes in the royalty rates resulting from provincial royalty reviews, could also adversely affect the value of our oil and gas investments.
- Difficult economic conditions could result in higher vacancy, lower rental rates and lower demand for real estate investments, all of which would adversely impact the value of our real estate investments. Difficult economic conditions could also prevent companies in which we have made private equity investments from achieving their business plans and could cause the value of these investments to fall, or even cause the companies to fail. Our commercial real estate investments may be negatively impacted by the trends solidified by the COVID-19 pandemic, including the digitization of work and the transformation of physical retail. Declining valuation multiples in the public equity market would also likely cause values to decline in our private equity portfolio. The timing and amount of investment income from private equity investments is difficult to predict, and investment income from these investments can vary from quarter to quarter.
- Our timberland and farmland holdings are exposed to natural risks, such as prolonged drought, wildfires, insects, windstorms, flooding, and climate change. We are generally not insured for these types of risks but seek to mitigate their impact through portfolio diversification and prudent operating practices.
- More broadly, a rising interest rate environment could result in the value of some of our ALDA investments declining, particularly those with fixed contractual cash flows such as real estate.
- The negative impact of changes in these factors can take time to be fully reflected in the valuations of private investments, including ALDA, especially if the change is large and rapid, as market participants adjust their forecasts and better understand the potential medium to long-term impact of such changes. As a result, valuation changes in any given period may reflect the delayed impact of events that occurred in prior periods.
- We rely on a diversified portfolio of ALDA assets to generate relatively stable investment returns. Diversification benefits may be reduced at times, especially during a period of economic stress, which would adversely affect portfolio returns.
- The Company determines investment return assumptions for ALDA in accordance with the Standards of Practice for the valuation of insurance contract liabilities and guidance published by the CIA. The guidance requires that the investment return assumption for these assets should not be higher than the historical long-term average returns of an appropriate broad-based index. Where such experience is not available, the investment return assumption for these assets should not result in a lower reserve than an assumption based on a historical-return benchmark for public equities in the same jurisdiction. As a result, the impact of changes in the historical returns for public equity benchmarks may result in an update to our investment return assumptions for ALDA.

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

- We develop an investment strategy for the assets that back our liabilities. The strategy involves making assumptions on the kind of assets in which we will invest and the returns such assets will generate.
- We may not be able to implement our investment strategy as intended due to a lack of assets available at the returns we assume. This may result in a change in investment strategy and/or assumed future returns, thus adversely impacting our financial results.
- From time to time we may decide to adjust our portfolio asset mix which may result in adverse impacts to our financial results for one or more periods.

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

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

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

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

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

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

With the global interest rate benchmark reform where LIBOR / IBORs are expected to be discontinued beyond 2021 to mid- 2023 or reformed, the transition to alternative reference rates may adversely impact the valuation of our IBOR-based financial instruments.

- Manulife holds different types of instruments, including derivatives, bonds, loans and other floating rate instruments that reference LIBOR (London Interbank Offered Rate) or other Interbank Offered Rates (IBORs). A number of IBORs are either being reformed to be more robust and reliable or are being discontinued. As previously announced by the U.K. Financial Conduct Authority (FCA), the FCA will no longer compel panel banks to submit rate information used to determine LIBOR post 2021. Further to that announcement, on November 30, 2020, the ICE Benchmark Administration, the LIBOR's Administrator, proposed plans to extend the cessation of the most widely used USD LIBOR tenors (overnight, 1-month, 3-month, 6-month, 12-month) to mid-2023 from year end 2021. To address the increased risk that LIBOR may not exist beyond 2021 to mid-2023, regulatory authorities and public and private sector working groups in different jurisdictions have been considering alternative reference rates to replace or be used alongside certain IBORs. For example, the Secured Overnight Financing Rate (SOFR) has been identified to replace USD LIBOR and is being published by the Federal Reserve Bank of New York, while an enhanced Canadian Overnight Repo Rate Average (CORRA) published by the Bank of Canada has been chosen to exist alongside certain tenors of the Canadian Dollar Offered Rate (CDOR).
- At this time, we cannot predict how markets will respond to these new rates, and we cannot predict the effect of any changes to or discontinuation of LIBOR / IBORs on new or existing financial instruments to which we have exposure.
- To ensure a timely transition to alternative reference rates, Manulife has established an enterprise-wide program and governance structure across functions to identify, measure, monitor and manage financial and non-financial risks of transition. We monitor regulatory guidance and keep pace with developments such as the transition to SOFR discounting by clearing houses in early 4Q20. The extension of specific USD LIBOR tenors to mid-2023 allows more time for Manulife to address LIBOR legacy contracts with inadequate fallback language. In addition, the deferral provides an opportunity to ensure required updates to key items such as IT systems and business processes are addressed before the end of 2021 for certain IBOR transition initiatives.
- Any changes to or discontinuation of LIBOR / IBOR or change to an alternative reference rate may adversely affect the valuation of our existing interest-rate linked and derivatives securities we hold, the effectiveness of those derivatives in mitigating our risks, securities we have issued, or other assets, liabilities and other contractual rights and obligations whose value is tied to LIBOR / IBOR or to a LIBOR / IBOR alternative. Furthermore, depending on the nature of the alternative reference rate, we may become exposed to additional risks from other aspects of the business, including product design, pricing and models. Any change to or discontinuation of similar benchmark rates could have similar effects.

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

- Adverse market conditions may significantly affect our liquidity risk.
 - Reduced asset liquidity may restrict our ability to sell certain types of assets for cash without taking significant losses. If providers of credit preserve their capital, our access to borrowing from banks and others or access to other types of credit such as letters of credit, may be reduced. If investors have a negative perception of our creditworthiness, this may reduce access to wholesale borrowing in the debt capital markets or increase borrowing costs.
 - Liquid assets are required to pledge as collateral to support activities such as the use of derivatives for hedging purposes and to cover cash settlement associated with such derivatives.
 - The principal sources of our liquidity are cash, insurance and annuity premiums, fee income earned on AUM, cash flow from our investment portfolios, and our assets that are readily convertible into cash, including money market securities. The issuance of long-term debt, common and preferred shares and other capital securities may also increase our available liquid assets or be required to replace certain maturing or callable liabilities. In the event we seek additional financing, the availability and terms of such financing will depend on a variety of factors including market conditions, the availability of credit to the financial services industry, our credit ratings and credit capacity, as well as the possibility that customers, lenders or investors could develop a negative perception of our long-term or short-term financial prospects if we incur large financial losses or if the level of our business activity decreases due to a significant market downturn.
- Increased cleared derivative transactions coupled with margin rules on non-cleared derivatives could adversely impact our liquidity risk.
 - Over time our existing over the counter derivatives will migrate to clearing houses, or the Company and its counterparties may have the right to cancel derivative contracts after specific dates or in certain situations such as a ratings downgrade, which could accelerate the transition to clearing houses. Cleared derivatives are subject to both initial and variation margin requirements, and a more restrictive set of eligible collateral than non-cleared derivatives.
 - In addition, variation margin rules for non-cleared derivatives (including eligible collateral restrictions) have further increased our liquidity risk. Initial margin rules for non-cleared derivatives taking effect in September 2021 are also expected to increase our collateral pledging requirement.
- We are exposed to re-pricing risk on letters of credit.
 - In the normal course of business, third-party banks issue letters of credit on our behalf. In lieu of posting collateral, our businesses utilize letters of credit for which third parties are the beneficiaries, as well as for affiliate reinsurance transactions between subsidiaries of MFC. Letters of credit and letters of credit facilities must be renewed periodically. At time of renewal, the Company is exposed to re-pricing risk and under adverse conditions increases in costs may be realized. In the most extreme

scenarios, letters of credit capacity could become constrained due to non-renewals which would restrict our flexibility to manage capital. This could negatively impact our ability to meet local capital requirements or our sales of products in jurisdictions in which our operating companies have been affected. As at December 31, 2020, letters of credit for which third parties are beneficiaries, in the amount of \$103 million, were outstanding. There were no assets pledged against these outstanding letters of credit as at December 31, 2020.

- Our obligations to pledge collateral or make payments related to declines in value of specified assets may adversely affect our liquidity.
 - In the normal course of business, we are obligated to pledge assets to comply with jurisdictional regulatory and other requirements including collateral pledged in relation to derivative contracts and assets held as collateral for repurchase funding agreements. The amount of collateral we may be required to post under these agreements, and the amount of payments we are required to make to our counterparties, may increase under certain circumstances, including a sustained or continued decline in the value of our derivative contracts. Such additional collateral requirements and payments could have an adverse effect on our liquidity. As at December 31, 2020, total pledged assets were \$10,362 million, compared with \$5,844 million in 2019.
- Our bank subsidiary relies on confidence sensitive deposits.
 - Manulife Bank is a wholly owned subsidiary of our Canadian life insurance operating company, MLI. The Bank is principally funded by retail deposits. A real or perceived problem with the Bank or its parent companies could result in a loss of confidence in the Bank's ability to meet its obligations, which in turn may trigger a significant withdrawal of deposit funds. A substantial portion of the Bank's deposits are demand deposits that can be withdrawn at any time, while the majority of the Bank's assets are first residential mortgages in the form of home equity lines of credit, which represent long-term funding obligations. If deposit withdrawal speeds exceed our extreme stress test assumptions the Bank may be forced to sell assets at a loss to third parties or call the home equity lines of credit.

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

- The holders of common shares are entitled to receive dividends as and when declared by the Board of Directors of MFC, subject to the preference of the holders of Class A Shares, Class 1 Shares, Class B Shares (collectively, the "Preferred Shares") and any other shares ranking senior to the common shares with respect to priority in payment of dividends. The declaration and payment of dividends and the amount thereof is subject to the discretion of the Board of Directors of MFC and is dependent upon the results of operations, financial condition, cash requirements and future prospects of, and regulatory and contractual restrictions on the payment of dividends by MFC and other factors deemed relevant by the Board of Directors of MFC. Although MFC has historically declared quarterly cash dividends on the common shares, MFC is not required to do so and the Board of Directors of MFC may reduce, defer or eliminate MFC's common share dividend in the future.
- The foregoing risk disclosure in respect of the declaration and payment of dividends on the common shares applies equally in respect of the declaration and payment of dividends on the Preferred Shares, notwithstanding that the Preferred Shares have a fixed rate of dividend.
- See "Government Regulation" and "Dividends" in MFC's Annual Information Form dated February 10, 2021 for a summary of additional statutory and contractual restrictions concerning the declaration of dividends by MFC.

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.

Please read below for details on factors that could impact our level of credit risk and the strategies used to manage this risk:

Credit Risk Management Strategy

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

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

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

We limit the types of authorized derivatives and applications and require pre-approval of all derivative application strategies and regular monitoring of the effectiveness of derivative strategies. Derivative counterparty exposure limits are established based on a minimum acceptable counterparty credit rating (generally A- from internationally recognized rating agencies). We measure derivative counterparty exposure as net potential credit exposure, which takes into consideration mark-to-market values of all transactions with each counterparty, net of any collateral held, and an allowance to reflect future potential exposure. Reinsurance counterparty exposure is measured reflecting the level of ceded liabilities net of collateral held. The creditworthiness of all reinsurance counterparties is reviewed internally on a regular basis.

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

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

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

Our credit policies, procedures and investment strategies are established under a strong governance framework and are designed to ensure that risks are identified, measured and monitored consistent with our risk appetite. We seek to actively manage credit exposure in our investment portfolio to reduce risk and minimize losses, and derivative counterparty exposure is managed proactively. However, we could experience volatility on a quarterly basis and losses could potentially rise above long-term expected and historical levels.

Credit Risk Exposure Measures

Allowances for losses on loans are established taking into consideration normal historical credit loss levels and future expectations, with an allowance for adverse deviations. Additionally, we make general provisions for credit losses from future asset impairments in the determination of policy liabilities. The amount of the provision for credit losses included in policy liabilities is established 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. To the extent that an asset is written off, or disposed of, any allowance and general provisions for credit losses are released.

Our general provision for credit losses included in policyholder liabilities as at December 31, 2020 was \$4,387 million compared to \$3,959 million as at December 31, 2019. This provision represents 1.7% of our fixed income assets¹ supporting policy liabilities reported on our Consolidated Statements of Financial Position as at December 31, 2020.

As at December 31, 2020 and December 31, 2019, the impact of a 50% increase in fixed income credit default rates over the next year in excess of the rates assumed in policy liabilities, would reduce net income attributed to shareholders by \$80 million and \$69 million, respectively.

Credit downgrades of fixed income investments would adversely impact our regulatory capital, as required capital levels for these investments are based on the credit quality of each instrument. In addition, credit downgrades could also lead to a higher general provision for credit losses than had been assumed in policy liabilities, resulting in an increase in policy liabilities and a reduction in net income attributed to shareholders. The estimated impact of a one-notch² ratings downgrade across 25% of fixed income assets would result in an increase to policy liabilities and a decrease to our net income attributed to shareholders of \$350 million post-tax. This ratings downgrade would result in a one percentage point reduction to our LICAT ratio.

Approximately 60% of the impact on our policy liabilities and net income attributed to shareholders relates to fixed income assets rated BBB and below.

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

Net Impaired Assets and Loan Losses

As at December 31,

(\$ millions, unless otherwise stated)

	2020	2019
Net impaired fixed income assets	\$ 295	\$ 234
Net impaired fixed income assets as a % of total invested assets	0.072%	0.062%
Allowance for loan losses	\$ 107	\$ 20

Credit Risk Factors

Borrower or counterparty defaults or downgrades could adversely impact our earnings.

Worsening regional and global economic conditions could result in borrower or counterparty defaults or downgrades and could lead to increased provisions or impairments related to our general fund invested assets and off-balance sheet derivative financial instruments, and

¹ Includes debt securities, private placements and mortgages.

² A one-notch downgrade is equivalent to a ratings downgrade from A to A- or BBB- to BB+.

an increase in provisions for future credit impairments to be included in our policy liabilities. Any of our reinsurance providers being unable or unwilling to fulfill their contractual obligations related to the liabilities we cede to them could lead to an increase in policy liabilities.

Our invested assets primarily include investment grade bonds, private placements, commercial mortgages, asset-backed securities, and consumer loans. These assets are generally carried at fair value, but changes in value that arise from a credit-related impairment are recorded as a charge against income. The return assumptions incorporated in actuarial liabilities include an expected level of future asset impairments. There is a risk that actual impairments will exceed the assumed level of impairments in the future and earnings could be adversely impacted.

Volatility may arise from defaults and downgrade charges on our invested assets and as a result, losses could potentially rise above long-term expected levels. Net impaired fixed income assets were \$295 million, representing 0.07% of total general fund invested assets as at December 31, 2020, compared with \$234 million, representing 0.06% of total general fund invested assets as at December 31, 2019.

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

- The Company uses derivative financial instruments to mitigate exposures to public equity, foreign currency, interest rate and other market risks arising from on-balance sheet financial instruments, guarantees related to variable annuity products, selected anticipated transactions and certain other guarantees. The Company may be exposed to counterparty risk if a counterparty fails to pay amounts owed to us or otherwise perform its obligations to us. Counterparty risk increases during economic downturns because the probability of default increases for most counterparties. If any of these counterparties default, we may not be able to recover the amounts due from that counterparty. As at December 31, 2020, the largest single counterparty exposure, without taking into account the impact of master netting agreements or the benefit of collateral held, was \$4,110 million (2019 – \$3,047 million). The net exposure to this counterparty, after taking into account master netting agreements and the fair value of collateral held, was nil (2019 – nil). As at December 31, 2020, 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 \$28,685 million (2019 – \$20,144 million) compared with \$119 million after taking into account master netting agreements and the benefit of fair value of collateral held (2019 – \$67 million). The exposure to any counterparty would grow if, upon the counterparty's default, markets moved such that our derivatives with that counterparty gain in value. Until we are able to replace that derivative with another counterparty, the gain on the derivatives subsequent to the counterparty's default would not be backed by collateral.
- The Company reinsures a portion of the business we enter into; however, we remain legally liable for contracts that we had reinsured. In the event that any of our reinsurance providers were unable or unwilling to fulfill their contractual obligations related to the liabilities we cede to them, we would need to increase actuarial reserves, adversely impacting our net income attributed to shareholders and capital position. In addition, the Company has over time sold certain blocks of business to third-party purchasers using reinsurance. To the extent that the reinsured contracts are not subsequently novated to the purchasers, we remain legally liable to the insureds. Should the purchasers be unable or unwilling to fulfill their contractual obligations under the reinsurance agreement, we would need to increase policy liabilities resulting in a charge to net income attributed to shareholders. To reduce credit risk, the Company may require purchasers to provide collateral for their reinsurance liabilities.
- We participate in a securities lending program whereby blocks of securities are loaned to third parties, primarily major brokerage firms and commercial banks. Collateral, which exceeds the market value of the loaned securities, is retained by the Company until the underlying security has been returned. If any of our securities lending counterparties default and the value of the collateral is insufficient, we would incur losses. As at December 31, 2020, the Company had loaned securities (which are included in invested assets) valued at approximately \$889 million, compared with \$558 million as at December 31, 2019.

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

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

Product Risk

We make a variety of assumptions related to the expected future level of claims, policyholder behaviour, expenses, reinsurance costs and sales levels when we design and price products, and when we establish policy liabilities. Product risk is the risk of failure to design, implement and maintain a product or service to achieve these expected outcomes and the risk of loss due to actual experience emerging differently than assumed when a product was designed and priced. Assumptions for future claims are generally based on both Company and industry experience, and assumptions for future policyholder behaviour and expenses are generally based on Company experience. Assumptions for future policyholder behaviour include assumptions related to the retention rates for insurance and wealth products. Assumptions for expenses include assumptions related to future maintenance expense levels and volume of the business.

Please read below for details on factors that could impact our level of product risk and the strategies used to manage this risk:

Product Risk Management Strategy

Product risk is governed by the Product Oversight Committee for the insurance business and by the Global WAM Risk Committee for global WAM business.

Product Oversight Committee

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

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

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

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

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

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

Global Wealth and Asset Management (“Global WAM”) Product Risk Management Committee

Global WAM product risk is governed by the Global WAM Risk Management Committee, which reviews and approves notable new products prior to launch. This committee has established a framework for managing risk under a set of policies, standards and guidelines to ensure that notable product offerings align with Global WAM risk-taking philosophy and risk appetite.

The Global WAM Risk Management Committee also provides oversight of notable changes to existing products/solutions on the various Global WAM platforms.

Product Risk Factors

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

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

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

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

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

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

Life and health insurance claims may be impacted unexpectedly by changes in the prevalence of diseases or illnesses, medical and technology advances, widespread lifestyle changes, natural disasters, large-scale human-made disasters and acts of terrorism.

- Claims resulting from catastrophic events could cause substantial volatility in our financial results in any period and could materially reduce our profitability or harm our financial condition. Large-scale catastrophic events may also reduce the overall level of economic activity, which could hurt our business and our ability to write new business. It is possible that geographic concentration of insured individuals could increase the severity of claims we receive from future catastrophic events. The effectiveness of external parties, including governmental and nongovernmental organizations, in combating the severity of such an event is outside of our control and could have a material impact on the losses we experience.
- The cost of health insurance benefits may be impacted by unforeseen trends in the incidence, termination and severity rates of claims. The ultimate level of lifetime benefits paid to policyholders may be increased by an unexpected increase in life expectancy. For example, advances in technology could lead to longer lives through better medical treatment or better disease prevention. Policyholder behaviour including premium payment patterns, policy renewals, lapse rates and withdrawal and surrender activity are influenced by many factors including market and general economic conditions, and the availability and relative attractiveness of other products in the marketplace. For example, a weak or declining economic environment could increase the value of guarantees associated with variable annuities or other embedded guarantees and contribute to adverse policyholder behaviour experience, or a rapid rise in interest rates could increase the attractiveness of alternatives for customers holding products that offer contractual surrender benefits that are not market value adjusted, which could also contribute to adverse policyholder behaviour experience. As well, adverse claims experience could result from systematic anti-selection, which could arise from the development of investor owned and secondary markets for life insurance policies, anti-selective lapse behaviour, underwriting process failures, anti-selective policyholder behaviour due to greater consumer accessibility to home-based medical screening, or other factors.
- For information on the implications of the COVID-19 pandemic on our product risk, please refer to “Pandemic risk and potential implications of COVID-19” below.

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

- As part of our overall risk and capital management strategy, we purchase reinsurance protection on certain risks underwritten or assumed by our various insurance businesses. As the global reinsurance industry continues to review and optimize their business models, certain of our reinsurers have attempted to increase rates on our existing reinsurance contracts. The ability of our reinsurers to increase rates depends upon the terms of each reinsurance contract. Typically, the reinsurer’s ability to raise rates is restricted by a number of terms in our reinsurance contracts, which we seek to enforce. We believe our reinsurance provisions are appropriate; however, there can be no assurance regarding the impact of future rate increase actions taken by our reinsurers. Accordingly, future rate increase actions by our reinsurers could result in accounting charges, an increase in the cost of reinsurance and the assumption of more risk on business already reinsured.
- In addition, an increase in the cost of reinsurance could also adversely affect our ability to write future business or result in the assumption of more risk with respect to policies we issue. Premium rates charged on new policies we write are based, in part, on the assumption that reinsurance will be available at a certain cost. Certain reinsurers may attempt to increase the rates they charge us for

new policies we write, and for competitive reasons, we may not be able to raise the premium rates we charge for newly written policies to offset the increase in reinsurance rates. If the cost of reinsurance were to increase, if reinsurance were to become unavailable and if alternatives to reinsurance were not available, our ability to write new policies at competitive premium rates could be adversely affected.

Operational Risk

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

Please read below for details on factors that could impact our level of operational risk and the strategies used to manage this risk:

Operational Risk Management Strategy

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

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

Legal and Regulatory Risk Management Strategy

Global Compliance oversees our regulatory compliance program and function, supported by designated Chief Compliance Officers in every segment. The program is designed to promote compliance with regulatory obligations worldwide and to assist in making the Company's employees aware of the laws and regulations that affect it, and the risks associated with failing to comply. Segment Compliance groups monitor emerging legal and regulatory issues and changes and prepare us to address new requirements. Global Compliance also independently assesses and monitors the effectiveness of a broad range of regulatory compliance processes and business practices against potential legal, regulatory, fraud and reputation risks, and allows significant issues to be escalated and proactively mitigated. Among these processes and business practices are: privacy (i.e. handling of personal and other confidential information), sales and marketing practices, sales compensation practices, asset management practices, fiduciary responsibilities, employment practices, underwriting and claims processing, product design, the Ethics Hotline, and regulatory filings. In addition, we have policies, processes and controls in place to help protect the Company, our customers and other related third parties from acts of fraud and from risks associated with money laundering and terrorist financing. Audit Services, Global Compliance and Segment Compliance personnel periodically assess the effectiveness of the system of internal controls. For further discussion of government regulation and legal proceedings, refer to "Government Regulation" in MFC's Annual Information Form dated February 10, 2021 and note 18 of the 2020 Annual Consolidated Financial Statements.

Business Continuity Risk Management Strategy

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

Technology & Information Security Risk Management Strategy

Our Technology Risk Management function provides strategy, direction, and oversight and facilitates governance for all technology risk domain activities across the Company. The scope of this function includes: reducing information risk exposures by introducing a robust enterprise information risk management framework and supporting infrastructure for proactively identifying, managing, monitoring and reporting on critical information risk exposures; promoting transparency and informed decision-making by building and maintaining information risk profiles and risk dashboards for Enterprise Technology & Services and segments aligned with enterprise and operational risk reporting; providing advisory services to Global Technology and the segments around current and emerging technology risks and their

impact to the Company's information risk profile; and reducing vendor information risk exposures by incorporating sound information risk management practices into sourcing, outsourcing and offshoring initiatives and programs.

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

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

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

Human Resource Risk Management Strategy

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

Model Risk Management Strategy

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

Third-Party Risk Management Strategy

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

Initiative Risk Management Strategy

To seek to ensure that key initiatives are successfully implemented and monitored by management, we have a Global Strategy and Transformation Office, which is responsible for establishing policies and standards for initiative management. Our policies, standards and practices are benchmarked against leading practices.

The following section describes details on potential Operational Risk factors:

Operational Risk Factors

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

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

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

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

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

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

Key business processes may fail, causing material loss events and impacting our customers and reputation.

- A large number of complex transactions are performed by the organization, and there is risk that errors may have significant impact on our customers or result in a loss to the organization. Controls are in place that seek to ensure processing accuracy for our most significant business processes, and escalation and reporting processes have been established for when errors do occur.

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

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

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

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

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

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

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

- Our operations face the risk of discriminatory regulation, political and economic instability, the imposition of economic or trade sanctions, civil unrest or disobedience, market volatility and significant inflation, limited protection for, or increased costs to protect intellectual property rights, inability to protect and/or enforce contractual or legal rights, nationalization or expropriation of assets, price controls and exchange controls or other restrictions that prevent us from transferring funds out of the countries in which we operate.
- A substantial portion of our revenue and net income attributed to shareholders is derived from our operations outside of North America, primarily in key Asian markets. Some of these key geographical markets are developing and are rapidly growing countries and markets where these risks may be heightened. Failure to manage these risks could have a significant negative impact on our operations and profitability globally.
- Any plans to expand our global operations in markets where we operate and potentially in new markets may require considerable management time, as well as start-up expenses for market development before any significant revenues and earnings are generated. Operations in new foreign markets may achieve low margins or may be unprofitable, and expansion in existing markets may be affected by local economic and market conditions.

We are regularly involved in litigation.

- We are regularly involved in litigation, either as a plaintiff or defendant. These cases could result in an unfavourable resolution and could have a material adverse effect on our results of operations and financial condition. For further discussion of legal proceedings refer to note 18 of the 2020 Annual Consolidated Financial Statements.

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

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

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

- Technology is used in virtually all aspects of our business and operations; in addition, part of our strategy involves the expansion of technology to directly serve our customers. An interruption in the service of our technology resulting from system failure, cyber-attack, human error, natural disaster, human-made disaster, pandemic, or other unpredictable events beyond reasonable control could prevent us from effectively operating our business.
- While our facilities and operations are distributed across the globe, we can experience extreme weather, natural disasters, civil unrest, human-made disasters, power outages, pandemic, and other events which can prevent access to, and operations within, the facilities for our employees, partners, and other parties that support our business operations.
- We take measures to plan, structure and protect against routine events that may impact our operations, and maintain plans to recover from unpredictable events. The experience learned through the COVID-19 pandemic has stress tested these plans and has resulted in strengthening our continuity plans. For further information, see “Pandemic risk and potential implications of COVID-19” below. An interruption to our operations may subject us to regulatory sanctions and legal claims, lead to a loss of customers, assets and revenues, result in unauthorized disclosures of personal or confidential information, or otherwise adversely affect us from a financial, operational and reputational perspective.

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

- It is possible that the Company may not be able to anticipate or to implement effective preventive measures against all disruptions or privacy and security breaches, especially because the techniques used change frequently, generally increase in sophistication, often are not recognized until launched, and because cyber-attacks can originate from a wide variety of sources, including organized crime, hackers, terrorists, activists, and other external parties, including parties sponsored by hostile foreign governments. Those parties may also attempt to fraudulently induce employees, customers, and other users of the Company’s systems or third-party service providers to disclose sensitive information in order to gain access to the Company’s data or that of its customers or clients. We, our customers, regulators and other third parties have been subject to, and are likely to continue to be the target of, cyber-attacks, including computer viruses, malicious or destructive code, phishing attacks, denial of service and other security incidents, that could result in the unauthorized release, gathering, monitoring, misuse, loss or destruction of personal, confidential, proprietary and other information of the Company, our employees, our customers or of third parties, or otherwise materially disrupt our or our customers’ or other third parties’ network access or business operations. These attacks could adversely impact us from a financial, operational and reputational perspective.
- The Company maintains an Information Risk Management Program, which includes information and cyber security defenses, to protect our networks and systems from attacks; however, there can be no assurance that these counter measures will be successful in every instance in protecting our networks against advanced attacks. In addition to protection, detection and response mechanisms, the Company maintains cyber risk insurance, but this insurance may not cover all costs associated with the financial, operational and reputational consequences of personal, confidential or proprietary information being compromised.

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

- We are relying on some highly complex models for pricing, valuation and risk measurement, and for input to decision making. Consequently, the risk of inappropriate use or interpretation of our models or their output, or the use of deficient models, could have a material adverse effect on our business.

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

- Policies and procedures are in place to prevent and detect fraud incidents; however, our existing system of internal controls may not be able to mitigate all possible incidents, which could adversely impact our business, results of operations, financial condition, and reputation. We continue to enhance our capabilities to better protect against ever-evolving fraud threats, but we may nevertheless not be able to mitigate all possible incidents.

Contracted third parties may fail to deliver against contracted activities.

- We rely on third parties to perform a variety of activities on our behalf, and failure of our most significant third parties to meet their contracted obligations may impact our ability to meet our strategic objectives or may directly impact our customers. Vendor governance processes are in place that seek to ensure that appropriate due diligence is conducted at time of vendor contracting, and ongoing vendor monitoring activities are in place that seek to ensure that the contracted services are being fulfilled to satisfaction, but we may nevertheless not be able to mitigate all possible failures.

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

Environmental risk may originate from investment properties that are subject to natural or human-made environmental risk. Real estate assets may be owned, leased and/or managed, as well as mortgaged by Manulife and we might enter into the chain of liability due to foreclosure ownership when in default.

Liability under environmental protection laws resulting from our commercial mortgage loan portfolio and owned property (including commercial real estate, oil and gas, timberland and farmland properties) may adversely impact our reputation, results of operations and financial condition. Under applicable laws, contamination of a property with hazardous materials or substances may give rise to a lien on the property to secure recovery of the costs of cleanup. In some instances, this lien has priority over the lien of an existing mortgage encumbering the property. The environmental risk may result from on-site or off-site (adjacent) due to migration of regulated pollutants or contaminates with financial or reputational environmental risk and liability consequences by virtue of strict liability. Environmental risk could also arise from natural disasters (e.g., climate change, weather, fire, earthquake, floods, and pests) or human activities (use of chemicals, pesticides) conducted within the site or when impacted from adjacent sites.

Additionally, as lender, we may incur environmental liability (including without limitation liability for clean-up, remediation and damages incurred by third parties) similar to that of an owner or operator of the property, if we or our agents exercise sufficient control over the operations at the property. We may also have liability as the owner and/or operator of real estate for environmental conditions or contamination that exist or occur on the property or affecting other property.

In addition, failure to adequately prepare for the potential impacts of climate change may have a negative impact on our financial position or our ability to operate. Potential impacts may be direct or indirect and may include: business losses or disruption resulting from extreme weather conditions; the impact of changes in legal or regulatory framework made to address climate change; the impact to fixed income asset values for portfolio investments in fossil-fuel related industries; or increased mortality or morbidity resulting from environmental damage or climate change. For further information, see “Strategic Risk Management Strategy, Environmental, Social and Governance Risks”.

Pandemic risk and potential implications of COVID-19

In the first quarter of 2020, the viral outbreak known as COVID-19 rapidly developed into a global pandemic and has continued to spread. In response, worldwide emergency measures were taken, and continue to be taken, to combat the spread of the virus, including the imposition of travel restrictions, business closure orders, and regional quarantines and physical distancing requirements. In addition, governments have implemented unprecedented monetary and fiscal policy changes aimed to help stabilize economies and capital markets. We cannot predict future legal and regulatory responses to concerns about the COVID-19 pandemic and related public health issues and how these responses may impact our business. The COVID-19 pandemic, actions taken globally in response to it, and the ensuing economic downturn have caused significant disruption to global supply chains, business activities and economies. The depth, breadth and duration of these disruptions continue to remain highly uncertain. While the pandemic continues, with local or regional resurgences, as well as the outbreak of mutated variations of the initial COVID-19 virus, governments continue to apply a variety of measures to concurrently mitigate further strains on public health systems and help stabilize economies. As a result, it is difficult to predict how significant the longer-term impact of the COVID-19 pandemic, including any responses to it, will be on the global economy and our business. These disruptions, if they continue, could have a significant adverse impact on our global businesses and operations and on our financial results.

We have outlined these risks in more detail in two parts. Those risk factors related specifically to the COVID-19 pandemic are described in this section and those related to the broader economic uncertainty are described below (see “Global outlook and economic uncertainties” below). These risks should be read in conjunction with the other risks and risk mitigation strategies outlined in this “Risk Factors and Risk Management” section.

Implications on strategic risk factors

- The ongoing COVID-19 pandemic could continue to adversely impact our financial results in future periods as a result of reduced new business, reduced asset-based fee revenue, and net unfavourable policyholder experience including claims experience and premium persistency. The uncertainty around the expected duration of the pandemic and the measures put in place by governments to respond to it could further depress business activity and financial markets, which could lead to lower net income attributed to shareholders. While in recent years we have taken significant actions to diversify and bolster the resilience of our Company, further management actions may be required, including, but not limited to, changes to business and product mix, pricing structures on in-force and new business, investment mix, hedging programs, and the use of reinsurance.
- Collaborative activities required to advance our strategic initiatives could also be impeded as emergency measures to combat the virus significantly restrict direct human interactions and movement. Although we expect that our digital capabilities and tools should enable us to reasonably conduct business while emergency measures are in place, there can be no assurance these or other strategies taken to address adverse impacts related to the COVID-19 pandemic will be successful.
- We have experienced ongoing disruptions to our underwriting processes as a result of government measures taken to stop the spread of the virus, including the temporary closure of paramedical services in some markets, as well as consumer fears over in-person services which have led to lower sales volumes. To help mitigate the impacts of these disruptions, and to continue to support our

customers with their insurance needs, we took steps to temporarily adjust our underwriting processes to allow us to accept certain low risk applications. We will continue to monitor the situation and adjust underwriting practices where necessary (for example, continued use of digital applications and further potential modifications to underwriting requirements for lower risk applications).

Implications on product risk factors

- Claims and lower lapses on certain products resulting from pandemic-related events could cause substantial volatility in our financial results in any period and could materially reduce our profitability or impair our financial condition. Further, large-scale events such as COVID-19 reduce the overall level of economic activity as well as activity through our distribution channels, which could continue to adversely impact our ability to write new business. It is also possible that geographic concentration of insured individuals could increase the severity of claims experience. The effectiveness of external parties, including governmental and non-governmental organizations, in combating the pandemic is outside of our control but could also have a material and adverse impact on our results of operations.
- Increased economic uncertainty and increased unemployment resulting from the economic impacts of the spread of COVID-19 may also result in policyholders seeking sources of liquidity and withdrawing at rates greater than we previously expected. If premium persistency is less than anticipated or if policyholder lapse rates significantly exceed our expectations, it could have a material adverse effect on our business, financial condition, results of operations and cash flows.
- We purchase reinsurance protection on certain risks underwritten or assumed by our various insurance businesses. As a result of COVID-19 we may find reinsurance more difficult or costly to obtain. In addition, reinsurers may dispute, or seek to reduce or eliminate, coverage on policies as a result of any changes to policies or practices we make as a result of COVID-19.

Implications on operational risk factors

- The pandemic has resulted in the imposition of government measures to restrict the movement of people, including travel bans and physical distancing requirements and other containment measures. These measures have led to disruptions to business operations across our global offices. While our business continuity plans have been executed across the organization with the vast majority of employees shifting to remote work arrangements and our networks and systems have generally remained stable in supporting this large-scale effort, there can be no assurance that our ability to continue to operate our business will not be adversely impacted if our networks and systems, including those aspects of our operations which rely on services provided by third parties, fail to operate as expected. The successful execution of business continuity strategies by third parties is outside our control. If one or more of the third parties to whom we outsource certain critical business activities fails to perform as a result of the impacts from the spread of COVID-19, it may have a material adverse effect on our business and operations.
- In the first and second quarters of 2020, our global processing centres' operational capacity was temporarily impacted due to strict government measures to lock down businesses and limit the movement of people within their jurisdictions, which resulted in slower processing times and lower than expected customer experience. This reduction in operating capacity required us to reallocate capacity to less impacted geographies, expand the use of remote work capabilities, and deprioritize non-essential business activities. While the capacity of our global processing centres has been restored, there can be no assurance that strategies taken to mitigate COVID-19 related pandemic impacts will continue to be successful if operating conditions deteriorate further in the future, either due to additional restrictions imposed by authorities or because of any other adverse development.
- The implementation of widespread remote work arrangements also increases other operational risks, including, but not limited to, fraud, money-laundering, information security, privacy, and third-party risks. We are relying on our risk management strategies to monitor and mitigate these and other operational risks during this period of heightened uncertainty.
- We may incur increased administrative expenses as a result of process and other changes we implemented in response to COVID-19. In addition, we may face increased workplace safety costs and risks and employee-relations challenges and claims, when more of our employees begin to return in person to our workplaces.

Global outlook and economic uncertainties

The COVID-19 pandemic and actions taken in response to it have resulted in a significant economic downturn and significant disruptions in supply chains and business activity globally. Updates to specific risk factors are noted below:

Implications on market risk factors

- The pandemic and resulting economic downturn has contributed to significant volatility and declines in financial and commodity markets. Central banks announced emergency interest rate cuts, while governments implemented and continue to assess additional and unprecedented fiscal stimulus packages to support economic stability. The pandemic has resulted in a global recessionary environment with continued market volatility and low or negative interest rates, which may continue to impact our net income attributed to shareholders. Our investment portfolio has been, and may continue to be, adversely affected as a result of market developments from the COVID-19 pandemic and related uncertainty.
- We have hedging programs, supported by a comprehensive collateral management program in place to help mitigate the risk of interest rate and public equity market volatility. Our interest rate and public equity variable annuity hedging programs have performed with a high level of effectiveness during this period of volatility to date.
- Extreme market volatility may leave us unable to react to market events in a manner consistent with our historical investment practices in dealing with more orderly markets. Market dislocations, decreases in observable market activity or unavailability of information

arising from the spread of COVID-19, may restrict our access to key inputs used to derive certain estimates and assumptions made in connection with financial reporting or otherwise, including estimates and changes in long-term macro-economic assumptions relating to accounting for future credit losses. Restricted access to such inputs may make our financial statement balances and estimates and assumptions used to run our business subject to greater variability.

- The global recessionary environment could continue to put downward pressure on asset valuations and increase the risk of potential impairments of investments, in particular, for more exposed sectors such as transportation, services and consumer cyclical industries. The COVID-19 pandemic has contributed to supply and demand shocks that have created historic dislocation in the energy markets and could continue to adversely impact our oil and gas and other energy-related investments. Furthermore, delays in general return-to-office policies and practices and/or reduced demand for office space could continue to have a negative impact on our commercial real estate portfolio.

Implications on liquidity risk and capital management

- Extreme market volatility and stressed conditions resulting from COVID-19 could result in additional cash and collateral demands primarily from changes to policyholder termination or renewal rates, withdrawals of customer deposit balances, borrowers renewing or extending their loans when they mature, derivative settlements or collateral demands, reinsurance settlements or collateral demands and our willingness to support the local solvency position of our subsidiaries. Such an environment could also limit our access to capital markets. We maintain strong financial strength ratings from our credit rating agencies. However, sustained global economic uncertainty could result in adverse credit ratings changes which in turn could result in more costly or limited access to funding sources. In addition, while we currently have a variety of sources of liquidity including cash balances, short-term investments, government and highly rated corporate bonds, and access to contingent liquidity facilities, there can be no assurance that these sources will provide us with sufficient liquidity on commercially reasonable terms in the future.
- On March 13, 2020, OSFI announced measures to support the resilience of financial institutions including their expectation for all federally regulated financial institutions that dividend increases and share buybacks should be halted for the time being. Accordingly, the Company has not repurchased its shares since March 13, 2020.

Implications on credit risk factors

- A prolonged economic slowdown or recession could continue to impact a wide range of industries to which we are exposed. Further, borrower or counterparty downgrades or defaults would cause increased provisions or impairments related to our general fund invested assets and derivative financial instruments, and an increase in provisions for future credit impairments to be included in our policy liabilities. This could result in losses potentially above our long-term expected levels.
- We have experienced downgrades across some industries in our portfolio which may continue in subsequent quarters. The general fund portfolio is constructed through credit selection criteria and is diversified with the majority of the portfolio rated investment grade which helps to mitigate risks associated with the current economic downturn. Our approach includes seeking investments which perform more favourably in the longer term, throughout economic and business cycles, but there can be no assurance these or other strategies taken to address adverse impacts related to the COVID-19 pandemic will be successful.

Emerging Risks

The identification and assessment of our external environment for emerging risks is an important aspect of our ERM Framework, as these risks, although yet to materialize, could have the potential to have a material adverse impact on our operations and/or business strategies. We also consider taking advantage of opportunities identified to improve our competitiveness and ultimately our financial results.

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

Regulatory Capital

OSFI's LICAT capital regime applies to our business globally on a group consolidated basis. We continue to meet OSFI's requirements and maintain capital in excess of regulatory expectations.

In November 2020, OSFI released an advisory to the LICAT guideline effective January 2021. These amendments are not expected to have a material impact. No material changes in LICAT requirements are currently anticipated in 2022, as OSFI is focusing its efforts on aligning the regulatory capital framework with the IFRS17 accounting changes effective January 2023, and updating the capital rules for Segregated Fund Guarantees, also expected to be effective in January 2023.

At its annual meeting in November 2019, the International Association of Insurance Supervisors ("IAIS") adopted a risk based global Insurance Capital Standard ("ICS"), that is expected to be further developed over a five-year monitoring period that commenced in 2020. While broadly supportive of the goals of ICS, OSFI stated that it did not support the current ICS design, citing that it was 'not fit for purpose for the Canadian market'. Without OSFI's consent, the IAIS rules will not apply in Canada or to Canadian companies on a group-wide basis, while other regulators may use the ICS framework for calculating capital in their specific markets. Limited changes were made to ICS in 2020. We will continue to monitor developments as the ICS methodology and its applicability evolve.

The IAIS has also been developing a holistic framework to assess and mitigate insurance sector systemic risk. It is not yet known how these proposals will affect capital or other regulatory requirements given that several key items of the framework remain under discussion.

Regulators in various jurisdictions in which we operate have embarked on reforming their respective capital regulations. The impact of these changes remains uncertain.

IFRS 17 and IFRS 9

IFRS 17 and IFRS 9 are effective for insurance companies in 2023.

IFRS 17 will replace IFRS 4 “Insurance Contracts” and will materially change the timing of the recognition of earnings and therefore equity. Furthermore, the requirements of the new standard are complex and will necessitate significant enhancements to finance infrastructure and processes and could impact business strategy. IFRS 9 will impact the measurement and timing of investment income.

Risks related to the new standards include:

- **The impact on regulatory capital.** In addition to the impact on timing of recognition of earnings and equity, the regulatory capital framework in Canada is currently aligned with IFRS. OSFI has stated that it intends to maintain capital frameworks consistent with current capital policies and to minimize potential industry-wide capital impacts that might arise from the accounting change. To achieve this outcome, we anticipate that OSFI will amend LICAT guidelines for IFRS 17 and is in the process of consulting directly with affected stakeholders.
- **The impact on our business strategy as a result of temporary volatility.** The treatment of the discount rate and new business gains under IFRS 17 could create material temporary volatility in our financial results and depending on the LICAT treatment, on our capital position. The Company's capital position and income for accounting purposes could be significantly influenced by prevailing market conditions, resulting in volatility of reported results, which may require changes to business strategies and the introduction of new non-GAAP measures to explain our results. The impact to business strategy could include changes to hedging and investment strategy, product strategy and the use of reinsurance and, as a result, could impact our exposures to other risks such as counterparty risk and liquidity risk.
- **The impact on tax.** In certain jurisdictions, including Canada, the implementation of IFRS 17 could have a material effect on tax positions and other financial metrics that are dependent upon IFRS accounting values.
- **The impact on operational readiness.** The adoption of IFRS 17 poses significant operational challenges for the insurance industry in the development and implementation of necessary technology systems solutions. The standard introduces complex estimation techniques, computational requirements and disclosures which necessitate a major transformation to the Company's systems along with actuarial and financial reporting processes. Once a system solution is available, significant efforts are required from insurers to integrate it into their financial reporting environment, perform impact studies, and educate and socialize the potential impacts with stakeholders.
- **The impact of inconsistencies in timing of adoption between various jurisdictions.** As a global insurer with subsidiaries in Asia, regional differences in effective dates will require us to maintain more than one set of financial records to support consolidated financial statements and for local entity reporting. Although early adoption is permitted, our local subsidiaries would be required to choose between alignment with the consolidated financial statements of the Canadian parent resulting in deviation with local competitors, in order to avoid maintaining two sets of financial records.

The Canadian Life and Health Insurance Association as well as Manulife and other Canadian and international insurers have highlighted the risk related to key jurisdictions adopting IFRS 17 on different timelines. Adoption of the standard in Canada before it is adopted by Europe and the UK increases the risk of potential changes to the interpretation and application of IFRS 17 during or subsequent to our adoption. This could result in significant revisions to our actuarial and accounting policies and estimates and potential systems changes.

Our extensive enterprise-wide implementation program includes the necessary resources to implement appropriate changes to policies and processes, education to internal and external stakeholders, sourcing appropriate data and deploying system solutions. Our governance model and active engagement with industry working groups helps to manage the risks noted above.

Additional Risk Factors That May Affect Future Results

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

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

10. Capital Management Framework

Manulife seeks to manage its capital with the objectives of:

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

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

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

We periodically assess the strength of our capital position under various stress scenarios. The annual Financial Condition Testing ("FCT", formerly Dynamic Capital Adequacy Testing) typically quantifies the financial impact of economic events arising from shocks in public equity and other markets, interest rates and credit, amongst others. Our 2020 FCT results demonstrate that we would have sufficient assets, under the various adverse scenarios tested, to discharge our policy liabilities. This conclusion was also supported by a variety of other stress tests conducted by the Company.

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

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

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

Financing Activities

Securities transactions

During 2020, we raised a total of \$4.3 billion of debt securities in Canada, the U.S. and Asia; and \$1.9 billion of debt securities matured or were redeemed at par.

(\$ millions)	Issued	Redeemed/Matured
2.237% MFC Subordinated debentures, issued on May 12, 2020	\$ 996	\$ -
2.818% MFC Subordinated debentures, issued on May 12, 2020	995	-
2.484% MFC US Senior notes, issued on May 19, 2020	632	-
2.396% MFC US Senior notes, issued on Jun 1, 2020	254	-
3.050% MFC US Senior notes, issued on Aug 27, 2020	1,460	-
2.640% MLI Subordinated debentures, redeemed on Jan 15, 2020	-	500
2.100% MLI Subordinated debentures, redeemed on Jun 1, 2020	-	750
4.900% MFC US Senior debenture notes, matured on Sept 17, 2020	-	649
Total	\$ 4,337	\$ 1,899

In addition, following the announcement during the fourth quarter of 2020, MLI redeemed in full its 2.389% subordinated debentures at par, on January 5, 2021.

Normal Course Issuer Bid

On March 13, 2020, the Office of the Superintendent of Financial Institutions ("OSFI") announced measures to support the resilience of financial institutions. Consistent with these measures, OSFI set the expectation for all federally regulated financial institutions that dividend increases and share buybacks should be halted for the time being. Accordingly, the Company has not repurchased its shares since March 13, 2020.

MFC's normal course issuer bid ("NCIB") expired on November 13, 2020. Under this NCIB that commenced on November 14, 2019, MFC purchased for cancellation 16.5 million of its common shares at an average price of \$25.26 per share for a total cost of \$0.42 billion.

During 2020, MFC purchased and subsequently cancelled 10.2 million of its common shares at an average price of \$24.86 per common share for a total cost of \$0.25 billion.

Consolidated capital

As at December 31,
(\$ millions)

	2020	2019	2018
Non-controlling interests	\$ 1,455	\$ 1,211	\$ 1,093
Participating policyholders' equity	(784)	(243)	94
Preferred shares	3,822	3,822	3,822
Common shareholders' equity ⁽¹⁾	48,513	45,316	42,142
Total equity	53,006	50,106	47,151
Adjusted for accumulated other comprehensive loss on cash flow hedges	(229)	(143)	(127)
Total equity excluding accumulated other comprehensive loss on cash flow hedges	53,235	50,249	47,278
Qualifying capital instruments	7,829	7,120	8,732
Consolidated capital⁽²⁾	\$ 61,064	\$ 57,369	\$ 56,010

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

⁽²⁾ Consolidated capital does not include \$6.2 billion (2019 – \$4.5 billion, 2018 – \$4.8 billion) of MFC senior debt as this form of financing does not meet OSFI's definition of regulatory capital at the MFC level. The Company has down-streamed the proceeds from this financing into operating entities in a form that qualifies as regulatory capital at the subsidiary level.

Consolidated capital was \$61.1 billion as at December 31, 2020 compared with \$57.4 billion as at December 31, 2019, an increase of \$3.7 billion. The increase was primarily driven by growth in retained earnings of \$3.4 billion, net capital issuances of \$0.7 billion, which does not include MFC senior debt as it does not qualify as regulatory capital,¹ and an increase in unrealized gains of AFS debt securities of \$0.4 billion, partially offset by a reduction in participating policyholders' equity of \$0.5 billion and the impact of a stronger Canadian dollar of \$0.4 billion.

Remittance of Capital

As part of its capital management, Manulife promotes internal capital mobility so that Manulife's parent company, MFC, has access to funds to meet its obligations and to optimize capital deployment. Cash remittance is defined as the cash remitted or payable to the Group from operating subsidiaries and excess capital generated by standalone Canadian operations. It is one of the key metrics used by management to evaluate our financial flexibility. In 2020, MFC subsidiaries delivered \$1.6 billion in remittances compared with \$2.8 billion in 2019. The \$1.2 billion reduction was due to capital injections to our Asia operations in response to the low interest-rate environment partially offset by stronger remittances from US and Canada.

Financial Leverage Ratio

MFC's financial leverage ratio increased to 26.6% as at December 31, 2020 from 25.1% as at December 31, 2019, driven by the impact of net issuance of \$2.4 billion of securities, partially offset by the growth in retained earnings.

Common Shareholder Dividends

The declaration and payment of shareholder dividends and the amount thereof are at the discretion of the Board of Directors and depend upon various factors, including the results of operations, financial condition, future prospects of the Company, dividend payout ratio and taking into account regulatory restrictions on the payment of shareholder dividends. On March 13, 2020, OSFI announced measures to support the resilience of financial institutions and set the expectation for all federally regulated financial institutions that dividend increases and share buybacks should be halted for the time being.

Common Shareholder Dividends Paid

The Company increased the quarterly dividend paid on its common shares beginning with the dividend paid in the first quarter of 2020², from \$0.25 per common share to \$0.28 per common share, bringing total common shareholder dividends to \$1.12 in 2020, an increase of 12% from 2019.

For the years ended December 31,
\$ per share

	2020	2019	2018
Dividends paid	\$ 1.12	\$ 1.00	\$ 0.91

¹ Consolidated capital does not include MFC senior debt (net issuance of \$1.7 billion in 2020) as this form of financing does not meet OSFI's definition of regulatory capital at the MFC level. The Company has down-streamed the proceeds from this financing into operating entities in a form that qualifies as regulatory capital at the subsidiary level.

² Declared February 12, 2020.

The Company offers a Dividend Reinvestment Program (“DRIP”) whereby shareholders may elect to automatically reinvest dividends in the form of MFC common shares instead of receiving cash. The offering of the program and its terms of execution are subject to the Board of Directors’ discretion.

During 2020, the required common shares in connection with the DRIP were purchased on the open market with no applicable discount.

Regulatory Capital Position¹

MFC and MLI are regulated by OSFI and are subject to consolidated risk based capital requirements. Manulife monitors and manages its consolidated capital in compliance with the OSFI LICAT guideline. Under this regime our available capital and other eligible capital resources are measured against a required amount of risk capital determined in accordance with the guideline. For regulatory purposes, LICAT available capital is based on the consolidated capital, adjusted for certain deductions, limits and restrictions, as mandated by the LICAT guideline.

Manulife’s operating activities are conducted within MLI and its subsidiaries. MLI’s LICAT total ratio was 149% as at December 31, 2020, compared with 140% as at December 31, 2019. The nine percentage point increase from December 31, 2019 was driven by market movements primarily from lower risk-free interest rates, by net capital issuances² and by the reinsurance of a block of legacy U.S. BOLI business, partly offset by several smaller items.

MFC’s LICAT total ratio was 135% as at December 31, 2020 compared with 129% as at December 31, 2019, with the increase driven by similar factors that impacted the movement in MLI’s LICAT total ratio. The difference between the MLI and MFC ratios is largely due to the \$6.2 billion (2019 – \$4.5 billion) of MFC senior debt outstanding that does not qualify as available capital at the MFC level but, based on the form it was down-streamed to MLI, it qualifies as regulatory capital at the MLI level.

The LICAT total ratios as at December 31, 2020 resulted in excess capital of \$29.1 billion over OSFI’s supervisory target ratio of 100% for MLI, and \$27.0 billion over OSFI’s regulatory minimum target ratio of 90% for MFC (no supervisory target is applicable to MFC). As at December 31, 2020, all MLI’s subsidiaries maintained capital levels in excess of local requirements.

Credit Ratings

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

During 2020, S&P, Moody’s, Fitch and AM Best Company (“AM Best”) maintained their assigned ratings of MFC and its primary insurance operating companies, while DBRS upgraded their rating of the Manulife group in September 2020.

The following table summarizes the financial strength ratings of MLI and certain of its subsidiaries as at January 31, 2021.

Financial Strength Ratings

Subsidiary	Jurisdiction	S&P	Moody’s	DBRS	Fitch	AM Best
The Manufacturers Life Insurance Company	Canada	AA-	A1	AA	AA-	A+ (Superior)
John Hancock Life Insurance Company (U.S.A.)	United States	AA-	A1	Not Rated	AA-	A+ (Superior)
Manulife (International) Limited	Hong Kong	AA-	Not Rated	Not Rated	Not Rated	Not Rated
Manulife Life Insurance Company	Japan	A+	Not Rated	Not Rated	Not Rated	Not Rated
Manulife (Singapore) Pte. Ltd.	Singapore	AA-	Not Rated	Not Rated	Not Rated	Not Rated

As of January 31, 2021, S&P, Moody’s, Fitch, DBRS and AM Best had a stable outlook on these ratings. The DBRS ratings upgrade resolved the positive outlook placed on the group in 2019. The S&P rating and related outlook for Manulife Life Insurance Company are constrained by the sovereign rating on Japan (A+/Stable).

¹ The “Risk Factors and Risk Management” section of the MD&A outlines a number of regulatory capital risks.

² LICAT reflects capital redemptions once the intention to redeem has been announced. As a result, the December 31, 2020 LICAT ratio reflects the impact of the \$350 million of MLI subordinated debentures redeemed in January 2021 (announced in November 2020).

11. Critical Actuarial and Accounting Policies

The preparation of Consolidated Financial Statements in conformity with IFRS requires management to make judgments, estimates and assumptions that affect the application of accounting policies and the reported amounts of assets and liabilities, and the disclosure of contingent assets and liabilities as at the date of the Consolidated Financial Statements, and the reported amounts of revenue and expenses during the reporting periods. Actual results may differ from these estimates. The most significant estimation processes relate to assumptions used in measuring insurance and investment contract liabilities, assessing assets for impairment, determining of pension and other post-employment benefit obligation and expense assumptions, determining income taxes and uncertain tax positions and fair valuation of certain invested assets. Estimates and underlying assumptions are reviewed on an ongoing basis. Revisions to accounting estimates are recognized in the year in which the estimates are revised and in any future years affected. Although some variability is inherent in these estimates, management believes that the amounts recorded are appropriate. The significant accounting policies used and the most significant judgments made by management in applying these accounting policies in the preparation of the 2020 Annual Consolidated Financial Statements are described in note 1 to the Consolidated Financial Statements.

Critical Actuarial Policies – Policy Liabilities (Insurance and Investment Contract Liabilities)

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

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

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

Best Estimate Assumptions

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

Mortality

Mortality relates to the occurrence of death. Mortality assumptions are based on our internal as well as industry past and emerging experience and are differentiated by sex, underwriting class, policy type and geographic market. We make assumptions about future mortality improvements using historical experience derived from population data. Reinsurance is used to offset some of our direct mortality exposure on in-force life insurance policies with the impact of the reinsurance directly reflected in our policy valuation for the determination of policy liabilities net of reinsurance. Actual mortality experience is monitored against these assumptions separately for each business. The results are favourable where mortality rates are lower than assumed for life insurance and where mortality rates are higher than assumed for payout annuities. Overall 2020 experience was unfavourable (2019 – unfavourable) when compared with our assumptions.

Morbidity

Morbidity relates to the occurrence of accidents and sickness for the insured risks. Morbidity assumptions are based on our internal as well as industry past and emerging experience and are established for each type of morbidity risk and geographic market. For our JH Long Term Care business we make assumptions about future morbidity changes. Actual morbidity experience is monitored against these

assumptions separately for each business. Our morbidity risk exposure relates to future expected claims costs for long-term care insurance, as well as for group benefits and certain individual health insurance products we offer. Overall 2020 experience was favourable (2019 – unfavourable) when compared with our assumptions.

Policy Termination and Premium Persistency

Policy termination includes lapses and surrenders, where lapses represent the termination of policies due 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 our recent experience adjusted for expected future conditions. Assumptions reflect differences by type of contract within each geographic market and actual experience is monitored against these assumptions separately for each business. Overall 2020 experience was unfavourable (2019 – unfavourable) when compared with our assumptions.

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 and are projected into the future with an allowance for inflation. For some developing businesses, there is an expectation that unit costs will decline as these businesses mature. Actual expenses are monitored against assumptions separately for each business. Overall maintenance expenses for 2020 were unfavourable (2019 – unfavourable) when compared with our assumptions. Taxes reflect assumptions for future premium taxes and other non-income related taxes. For income taxes, policy liabilities are adjusted only for temporary tax timing and permanent tax rate differences on the cash flows available to satisfy policy obligations.

Investment Returns

As noted in the “Risk Factors and Risk Management – Market Risk – Asset Liability Management Strategy” section above, our general fund product liabilities are categorized into groups with similar characteristics in order to support them with a specific asset strategy. We seek to align the asset strategy for each group to the premium and benefit pattern, policyholder options and guarantees, and crediting rate strategies of the products they support. The projected cash flows from the assets are combined with projected cash flows from future asset purchases/sales to determine expected rates of return for future years. The investment strategies for future asset purchases and sales are based on our target investment policies for each segment and the reinvestment returns are derived from current and projected market rates for fixed interest investments and our projected outlook for non-fixed interest assets. Credit losses are projected based on our own and industry experience, as well as specific reviews of the current investment portfolio. Investment return assumptions for each asset class also incorporate expected investment management expenses that are derived from internal cost studies. In 2020, actual investment returns were unfavourable (2019 – unfavourable) when compared with our assumptions. Investment-related experience and the direct impact of interest rates and equity markets are discussed in the “Financial Performance” section above.

Segregated Funds

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

Foreign Currency

Foreign currency risk results from a mismatch of the currency of the policy liabilities and the currency of the assets designated to support these obligations. We generally match the currency of our assets with the currency of the liabilities they support, with the objective of mitigating the risk of economic loss arising from movements in currency exchange rates. Where a currency mismatch exists, the assumed rate of return on the assets supporting the liabilities is reduced to reflect the potential for adverse movements in exchange rates.

Experience Adjusted Products

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

Provision for Adverse Deviation

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

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

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

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

As at December 31, (\$ millions)	2020	2019
Best estimate actuarial liability	\$ 268,147	\$ 246,105
Provision for adverse deviation ("PfAD")		
Insurance risks (mortality/morbidity)	\$ 19,549	\$ 18,147
Policyholder behaviour (lapse/surrender/premium persistency)	6,757	6,010
Expenses	1,950	1,688
Investment risks (non-credit)	33,531	29,650
Investment risks (credit)	1,121	1,061
Segregated funds guarantees	2,178	1,940
Total PfAD⁽¹⁾	65,086	58,496
Segregated funds – additional margins	16,388	13,680
Total of PfAD and additional segregated fund margins	\$ 81,474	\$ 72,176

⁽¹⁾ Reported net actuarial liabilities (excluding the \$4,720 million (2019 – \$5,031 million) reinsurance asset related to the Company's in-force participating life insurance closed block that is retained on a funds withheld basis as part of the New York Life transaction) as at December 31, 2020 of \$333,233 million (2019 – \$304,601 million) are comprised of \$268,147 million (2019 – \$246,105 million) of best estimate actuarial liabilities and \$65,086 million (2019 – \$58,496 million) of PfAD.

The change in the PfAD from period to period is impacted by changes in liability and asset composition, by currency and interest rate movements and by material changes in valuation assumptions. The overall increase in PfADs for insurance risks was primarily due to the impact of lower interest rates in the U.S. and Canada, the annual review of actuarial valuation methods and assumptions as well as the expected PfAD growth from in-force and new business, partially offset by the appreciation of the Canadian dollar relative to the U.S. dollar and Hong Kong dollar. The overall increase in PfADs for policyholder behaviour and expense was driven by the impact of lower interest rates in the U.S. and Canada and the expected PfAD growth from in-force and new business, partially offset by the appreciation of the Canadian dollar. The overall increase in PfADs for non-credit investment risks was driven by the expected PfAD growth from in-force and new business, lower interest rates in the U.S. and Canada, and the annual review of actuarial valuation methods and assumptions, partially offset by the appreciation of the Canadian dollar. The increase in the additional segregated fund margins was primarily due to increases in equity market and the annual review of actuarial valuation methods and assumptions.

Sensitivity of Earnings to Changes in Assumptions

When the assumptions underlying our determination of policy liabilities are updated to reflect recent and emerging experience or change in outlook, the result is a change in the value of policy liabilities which in turn affects net income attributed to shareholders. The sensitivity of net income attributed to shareholders to changes in non-economic and certain asset related assumptions underlying policy liabilities is shown below and assumes that there is a simultaneous change in the assumptions across all business units. The sensitivity of net income attributed to shareholders to a deterioration or improvement in non-economic assumptions underlying long-term care policy liabilities as at December 31, 2020 is also shown below.

For changes in asset related assumptions, the sensitivity is shown net of the corresponding impact on income of the change in the value of the assets supporting policy liabilities. In practice, experience for each assumption will frequently vary by geographic market and business, and assumption updates are made on a business/geographic specific basis. Actual results can differ materially from these estimates for a variety of reasons including the interaction among these factors when more than one changes, changes in actuarial and investment return and future investment activity assumptions, actual experience differing from the assumptions, changes in business mix, effective tax rates and other market factors, and the general limitations of our internal models.

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

As at December 31, (\$ millions)	Decrease in after-tax net income attributed to shareholders	
	2020	2019
Policy related assumptions		
2% adverse change in future mortality rates ^{(2),(4)}		
Products where an increase in rates increases insurance contract liabilities	\$ (500)	\$ (500)
Products where a decrease in rates increases insurance contract liabilities	(600)	(500)
5% adverse change in future morbidity rates (incidence and termination) ^{(3),(4),(5)}	(5,700)	(5,100)
10% adverse change in future policy termination rates ⁽⁴⁾	(2,600)	(2,400)
5% increase in future expense levels	(600)	(600)

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

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

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

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

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

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

As at December 31, (\$ millions)	Decrease in after-tax net income attributed to shareholders	
	2020	2019
Policy related assumptions		
2% adverse change in future mortality rates ^{(2),(3)}	\$ (300)	\$ (300)
5% adverse change in future morbidity incidence rates ^{(2),(3),(4)}	(2,100)	(1,900)
5% adverse change in future morbidity claims termination rates ^{(2),(3),(4)}	(3,100)	(2,800)
10% adverse change in future policy termination rates ^{(2),(3)}	(400)	(400)
5% increase in future expense levels ⁽³⁾	(100)	(100)

⁽¹⁾ Translated from US\$ at 1.2732 for 2020.

⁽²⁾ The impacts of the sensitivities on LTC for morbidity, mortality and lapse do not assume any partial offsets from the Company's ability to contractually raise premium rates in such events, subject to state regulatory approval. In practice, we would plan to file for rate increases equal to the amount of deterioration resulting from the sensitivities.

⁽³⁾ The impact of favourable changes to all the sensitivities is relatively symmetrical.

⁽⁴⁾ The comparatives for 2019 have been updated to reflect refinements between incidence and termination impacts implemented in 2020.

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

As at December 31, (\$ millions)	Increase (decrease) in after-tax net income attributed to shareholders			
	2020		2019	
	Increase	Decrease	Increase	Decrease
Asset related assumptions updated periodically in valuation basis changes				
100 basis point change in future annual returns for public equities ⁽¹⁾	\$ 500	\$ (500)	\$ 500	\$ (500)
100 basis point change in future annual returns for ALDA ⁽²⁾	4,200	(5,200)	3,800	(4,400)
100 basis point change in equity volatility assumption for stochastic segregated fund modelling ⁽³⁾	(200)	200	(300)	300

⁽¹⁾ The sensitivity to public equity returns above includes the impact on both segregated fund guarantee reserves and on other policy liabilities. Expected long-term annual market growth assumptions for public equities are based on long-term historical observed experience and compliance with actuarial standards. As at December 31, 2020, the growth rates inclusive of dividends in the major markets used in the stochastic valuation models for valuing segregated fund guarantees are 9.2% (9.2% – December 31, 2019) per annum in Canada, 9.6% (9.6% – December 31, 2019) per annum in the U.S. and 6.2% (6.2% – December 31, 2019) per annum in Japan. Growth assumptions for European equity funds are market-specific and vary between 8.3% and 9.9%.

⁽²⁾ ALDA include commercial real estate, timber, farmland, direct oil and gas properties, and private equities, some of which relate to oil and gas. Expected long-term return assumptions for ALDA and public equity are set in accordance with the Standards of Practice for the valuation of insurance contract liabilities and guidance published by the CIA. Annual best estimate return assumptions for ALDA and public equity include market growth rates and annual income, such as rent, production proceeds and dividends, and will vary based on our holding period. Over a 20-year horizon, our best estimate return assumptions range between 5.25% and 11.65%, with an average of 9.3% (9.3% – December 31, 2019) based on the current asset mix backing our guaranteed insurance and annuity business as of December 31, 2020. Our return assumptions including the margins for adverse deviations in our valuation, which take into account the uncertainty of achieving the returns, range between 2.5% and 7.5%, with an average of 6.1% (6.1% – December 31, 2019) based on the asset mix backing our guaranteed insurance and annuity business as of December 31, 2020.

⁽³⁾ Volatility assumptions for public equities are based on long-term historical observed experience and compliance with actuarial standards. The resulting volatility assumptions are 16.5% per annum in Canada and 17.1% per annum in the U.S. for large cap public equities, and 19.1% per annum in Japan. For European equity funds, the volatility varies between 16.3% and 17.7%.

Review of Actuarial Methods and Assumptions

A comprehensive review of actuarial methods and assumptions is performed annually. The review is designed to reduce the Company's exposure to uncertainty by ensuring assumptions for both asset related and liability related risks remain appropriate. This is accomplished by monitoring experience and selecting assumptions which represent a current best estimate view of expected future experience, and margins for adverse deviations that are appropriate for the risks assumed. While the assumptions selected represent the Company's current best estimates and assessment of risk, the ongoing monitoring of experience and changes in the economic environment are likely to result in future changes to the actuarial assumptions, which could materially impact the measurement of insurance contract liabilities.

2020 Review of Actuarial Methods and Assumptions

The completion of the 2020 annual review of actuarial methods and assumptions resulted in an increase in insurance contract liabilities of \$563 million, net of reinsurance, and a decrease in net income attributed to shareholders of \$198 million post-tax.

For the year ended December 31, 2020 (\$ millions)	Change in insurance contract liabilities, net of reinsurance			
	Total	Attributed to participating policyholders' account ⁽¹⁾	Attributed to shareholders' account	Change in net income attributed to shareholders (post-tax)
Canada variable annuity product review	\$ (42)	\$ -	\$ (42)	\$ 31
Mortality and morbidity updates	(304)	(1)	(303)	232
Lapses and policyholder behaviour	893	-	893	(682)
Investment-related updates	(212)	(153)	(59)	31
Other updates	228	455	(227)	190
Net impact	\$ 563	\$ 301	\$ 262	\$ (198)

⁽¹⁾ The change in insurance contract liabilities, net of reinsurance, attributable to the participating policyholders' account was driven by refinements to our valuation models, primarily due to annual updates to reflect market movements in the first half of 2020.

Canada variable annuity product review

The review of our variable annuity product in Canada resulted in a \$31 million post-tax gain to net income attributed to shareholders.

The gain was driven by refinements to our segregated fund guaranteed minimum withdrawal benefit valuation models, partially offset by updates to lapse assumptions to reflect emerging experience.

Updates to mortality and morbidity

Mortality and morbidity updates resulted in a \$232 million post-tax gain to net income attributed to shareholders.

The gain was primarily driven by a review of our reinsurance arrangements and mortality margins for preferred risk classes in our Canada Individual Insurance business, as well as updates to the morbidity assumptions on certain products in Japan. This was partially offset by a charge from the review of mortality assumptions in our U.S. Insurance business, where emerging experience showed higher mortality at older attained ages.

Other updates to mortality and morbidity assumptions were made across several products, largely in Canada, to reflect recent experience resulting in a net post-tax gain to net income attributable to shareholders.

Updates to lapses and policyholder behaviour

Updates to lapses and policyholder behaviour assumptions resulted in a \$682 million post-tax charge to net income attributed to shareholders.

We completed a detailed review of the lapse assumptions for universal life policies in Canada, including both yearly renewable term, and level cost of insurance products. We lowered the ultimate lapse assumptions due to the emergence of more recent data, which resulted in a post-tax charge of \$504 million to net income attributed to shareholders, primarily driven by adverse experience on large policies.

Other updates to lapse and policyholder behaviour assumptions were made across several products to reflect recent experience resulting in a net post-tax charge to net income attributable to shareholders. The primary driver of the charge was adverse lapse experience from retail policies in Japan.

Investment-related updates

Updates to investment return assumptions resulted in a \$31 million post-tax gain to net income attributed to shareholders.

Other updates

Other updates resulted in a \$190 million post-tax gain to net income attributed to shareholders. This incorporated several positive items including updates to our U.S. segregated fund guaranteed minimum withdrawal benefit valuation models, as well as updates to the projection of our tax and liability cash flows in the U.S. to align with updated U.S. tax and statutory reporting standard changes, partially offset by refinements to our valuation models, primarily driven by annual updates to reflect market movements in the first half of 2020.

Impact of changes in actuarial methods and assumptions by segment

The impact of changes in actuarial methods and assumptions in Canada resulted in a \$77 million post-tax gain to net income attributed to shareholders. The gain was driven by updates to certain Individual Insurance reinsurance arrangements and mortality margins for preferred risk classes, as well as refinements to our valuation models, primarily driven by annual updates to reflect market movements in the first half of 2020, largely offset by updated lapse assumptions on our universal life products.

In the U.S., the impact of changes in actuarial methods and assumptions resulted in a \$301 million post-tax charge to net income attributed to shareholders. The charge was driven by updates to our life mortality assumptions to reflect emerging experience, as well as refinements to our valuation models, primarily driven by annual updates to reflect market movements in the first half of 2020, partially offset by updates to our U.S. segregated fund guaranteed minimum withdrawal benefit valuation models, as well as updates to the projection of our tax and liability cash flows to align with updated U.S. tax and statutory reporting standards.

The impact of changes in actuarial methods and assumptions in Asia resulted in a \$41 million post-tax charge to net income attributed to shareholders. The charge was primarily driven by Japan, whereby lapse and morbidity updates on certain products to reflect emerging experience were partially offsetting.

The impact of changes in actuarial methods and assumptions in Corporate and Other (which includes our Reinsurance business) resulted in a \$67 million post-tax gain to net income attributed to shareholders.

2019 Review of Actuarial Methods and Assumptions

The 2019 full year review of actuarial methods and assumptions resulted in an increase in insurance contract liabilities of \$74 million, net of reinsurance, and a decrease in net income attributed to shareholders of \$21 million post-tax.

For the year ended December 31, 2019 (\$ millions)	Change in insurance contract liabilities, net of reinsurance			Change in net income attributed to shareholders (post-tax)
	Total	Attributed to participating policyholders' account	Attributed to shareholders' account	
Long-term care triennial review	\$ 11	\$ –	\$ 11	\$ (8)
Mortality and morbidity updates	25	47	(22)	14
Lapses and policyholder behaviour	135	17	118	(75)
Investment return assumptions	12	81	(69)	70
Other updates	(109)	(163)	54	(22)
Net impact	\$ 74	\$ (18)	\$ 92	\$ (21)

Long-term care triennial review

U.S. Insurance completed a comprehensive long-term care (“LTC”) experience study in 2019. The review included all aspects of claim assumptions, the impact of policyholder benefit reductions as well as the progress on future premium rate increases and a review of margins on the business. The impact of the LTC review was approximately net neutral to net income attributed to shareholders.

The experience study showed lower termination rates than expected during the elimination or “qualifying” period (which is the period between when a claim is filed and when benefit payments begin), and favourable incidence as policyholders are filing claims at a lower rate than expected. In addition, policyholders are electing to reduce their benefits in lieu of paying increased premiums. The overall claims experience review led to a post-tax charge to net income attributed to shareholders of approximately \$1.9 billion (US\$1.4 billion), which includes a gain of approximately \$0.2 billion (US\$0.16 billion) for the impact of benefit reductions.

The experience study included additional claims data due to the natural aging of the block of business. As a result, we reduced certain margins for adverse deviations, which resulted in a post-tax gain to net income attributed to shareholders of approximately \$0.7 billion (US\$0.5 billion).

While the study continued to support the assumptions of both future morbidity and mortality improvement, we reduced our morbidity improvement assumption, which resulted in a post-tax charge to net income attributed to shareholders of approximately \$0.7 billion (US\$0.5 billion).¹

The review of premium increases assumed in the policy liabilities resulted in a post-tax gain to net income attributed to shareholders of approximately \$2.0 billion (US\$1.5 billion) related to the expected timing and amount of premium increases that are subject to state approval and reflects a 30% provision for adverse deviation. The expected premium increases are informed by past approval rates applied to prior state filings that remain outstanding and estimated new requests based on our 2019 review of morbidity, mortality and lapse assumptions. Our actual experience in obtaining premium increases could be materially different than what we have assumed, resulting in further increases or decreases in policy liabilities, which could be material.²

¹ The padded morbidity assumption is 0.25% for 25 years (down from 0.45%) and unpadded morbidity improvement assumption is 0.50% to age 100 (down from 0.75%).

² See “Caution regarding forward-looking statements” above.

Updates to mortality and morbidity assumptions

Mortality and morbidity updates resulted in a \$14 million post-tax gain to net income attributed to shareholders. This included a review of our Canada Individual Insurance mortality and reinsurance arrangements.

Updates to lapses and policyholder behaviour

Updates to lapses and policyholder behaviour assumptions resulted in a \$75 million post-tax charge to net income attributed to shareholders.

The primary driver of the charge was an update to our lapse assumptions across several term and whole life product lines within our Canada Individual Insurance business, partially offset by several updates to lapse and premium persistency assumptions in other geographies.

Updates to investment return assumptions

Updates to investment return assumptions resulted in a \$70 million post-tax gain to net income attributed to shareholders.

The primary driver of the gain was an update to our senior secured loan default rates to reflect recent experience, as well as our investment and crediting rate strategy for certain universal life products. This was partially offset by updates to certain private equity investment assumptions in Canada.

Other updates

Other updates resulted in a \$22 million post-tax charge to net income attributed to shareholders.

Impact of changes in actuarial methods and assumptions by segment

The impact of changes in actuarial methods and assumptions in Canada was a post-tax charge to net income attributed to shareholders of \$108 million. This charge was driven by updates to lapse rates for certain products within Canada Individual Insurance and updates to certain private equity investment assumptions. In the U.S., we recorded a post-tax gain to net income attributed to shareholders of \$71 million, driven primarily by updates to senior secured loan default rates. In addition, several modelling refinements netted to a positive impact. Updates to assumptions in Asia segment and Corporate and Other segment (which includes our Reinsurance business) resulted in a post-tax gain of \$16 million.

Change in net insurance contract liabilities

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

2020 Net Insurance Contract Liability Movement Analysis

For the year ended December 31, 2020
(\$ millions)

	Asia	Canada	U.S.	Corporate and Other	Total
Balance, January 1	\$ 87,937	\$ 83,297	\$ 138,859	\$ (285)	\$ 309,808
New business ^{(1),(2)}	3,014	(229)	381	–	3,166
In-force movement ^{(1),(3)}	11,516	7,897	14,370	(131)	33,652
Changes in methods and assumptions ⁽¹⁾	393	(619)	840	(51)	563
Reinsurance transactions ^{(1),(4)}	–	–	(3,360)	–	(3,360)
Currency impact ⁽⁵⁾	98	–	(4,151)	9	(4,044)
Balance, December 31	\$ 102,958	\$ 90,346	\$ 146,939	\$ (458)	\$ 339,785

⁽¹⁾ The \$31,719 million increase reported as the change in insurance contract liabilities and change in reinsurance assets on the 2020 Consolidated Statements of Income primarily consists of changes due to the changes in methods and assumptions, normal in-force movement, new policies and associated embedded derivatives, partially offset by reinsurance transactions. The net impact of these items result in an increase of \$34,021 million, of which \$32,709 million is included in the Consolidated Statements of Income as an increase in insurance contract liabilities and change in reinsurance assets, with the remaining \$1,312 million increase included in net claims and benefits. The change in insurance contract liabilities amount on the Consolidated Statements of Income also includes the change in embedded derivatives associated with insurance contracts, however these embedded derivatives are included in other liabilities on the Consolidated Statements of Financial Position.

⁽²⁾ New business policy liability impact is positive/(negative) when estimated future premiums, together with future investment income, are expected to be more/(less) than sufficient to pay estimated future benefits, policyholder dividends and refunds, taxes (excluding income taxes) and expenses on new policies issued.

⁽³⁾ The net in-force movement over the year was an increase of \$33,652 million, primarily reflecting the impact of interest rate declines and expected growth in insurance contract liabilities in all three geographic segments.

⁽⁴⁾ On September 30, 2020, the Company, through its subsidiary John Hancock Life Insurance Company (U.S.A.), entered into a reinsurance agreement with Global Atlantic Financial Group Ltd to reinsure a block of legacy U.S. bank owned life insurance ("BOLI"). Under the terms of the transaction, the Company will maintain responsibility for servicing the policies with no expected impact to the BOLI policyholders. The transaction was structured such that the Company ceded policyholder contract liabilities and transferred invested assets backing these liabilities.

⁽⁵⁾ The decrease in policy liabilities from currency impact reflects the appreciation of the Canadian dollar relative to the U.S. dollar, Hong Kong dollar, slightly offset by the depreciation of the Canadian dollar relative to the Japanese yen. To the extent assets are currency matched to liabilities, the decrease in insurance contract liabilities due to currency impact is offset by a corresponding decrease from currency impact in the value of assets supporting those liabilities.

2019 Net Insurance Contract Liability Movement Analysis

For the year ended December 31, 2019
(\$ millions)

	Asia	Canada	U.S.	Corporate and Other	Total
Balance, January 1	\$ 76,127	\$ 76,628	\$ 133,142	\$ (168)	\$ 285,729
New business ^{(1),(2)}	2,996	(227)	482	–	3,251
In-force movement ^{(1),(3)}	12,079	6,770	12,163	(91)	30,921
Changes in methods and assumptions ⁽¹⁾	60	133	(84)	(35)	74
Currency impact ⁽⁴⁾	(3,325)	(7)	(6,844)	9	(10,167)
Balance, December 31	\$ 87,937	\$ 83,297	\$ 138,859	\$ (285)	\$ 309,808

⁽¹⁾ The \$32,458 million increase reported as the change in insurance contract liabilities and change in reinsurance assets on the 2019 Consolidated Statements of Income primarily consists of changes due to the changes in methods and assumptions, normal in-force movement, new policies and associated embedded derivatives. The net impact of these items result in an increase of \$34,246 million, of which \$33,496 million is included in the Consolidated Statements of Income as an increase in insurance contract liabilities and change in reinsurance assets, with the remaining \$750 million increase included in net claims and benefits. The change in insurance contract liabilities amount on the Consolidated Statements of Income also includes the change in embedded derivatives associated with insurance contracts, however these embedded derivatives are included in other liabilities on the Consolidated Statements of Financial Position.

⁽²⁾ New business policy liability impact is positive/(negative) when estimated future premiums, together with future investment income, are expected to be more/(less) than sufficient to pay estimated future benefits, policyholder dividends and refunds, taxes (excluding income taxes) and expenses on new policies issued.

⁽³⁾ The net in-force movement over the year was an increase of \$30,921 million, primarily reflecting the impact of interest rate declines and expected growth in insurance contract liabilities in all three geographic segments.

⁽⁴⁾ The decrease in policy liabilities from currency impact reflects the appreciation of the Canadian dollar relative to the U.S. dollar, Hong Kong dollar and Japanese yen. To the extent assets are currency matched to liabilities, the increase in insurance contract liabilities due to currency impact is offset by a corresponding increase from currency impact in the value of assets supporting those liabilities.

Critical Accounting Policies

Consolidation

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

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

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

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

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

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

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

Fair Value of Invested Assets

A large portion of the Company's invested assets are recorded at fair value. Refer to note 1 of the 2020 Annual Consolidated Financial Statements for a description of the methods used in determining fair values. When quoted prices in active markets are not available for a particular investment, significant judgment is required to determine an estimated fair value based on market standard valuation methodologies including discounted cash flow methodologies, matrix pricing, consensus pricing services, or other similar techniques. The inputs to these market standard valuation methodologies include: current interest rates or yields for similar instruments, credit rating of the issuer or counterparty, industry sector of the issuer, coupon rate, call provisions, sinking fund requirements, tenor (or expected tenor) of the instrument, management's assumptions regarding liquidity, volatilities and estimated future cash flows. Accordingly, the estimated fair values are based on available market information and management's judgments about the key market factors impacting these financial instruments. Financial markets are susceptible to severe events evidenced by rapid depreciation in asset values accompanied by a reduction in asset liquidity. The Company's ability to sell assets, or the price ultimately realized for these assets, depends upon the demand and liquidity in the market and increases the use of judgment in determining the estimated fair value of certain assets.

Evaluation of Invested Asset Impairment

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

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

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

Changes in circumstances may cause future assessments of asset impairment to be materially different from current assessments, which could require additional provisions for impairment. Additional information on the process and methodology for determining the allowance for credit losses is included in the discussion of credit risk in note 9 to the 2020 Consolidated Financial Statements.

Derivative Financial Instruments

The Company uses derivative financial instruments ("derivatives") including swaps, forwards and futures agreements, and options to help manage current and anticipated exposures to changes in interest rates, foreign exchange rates, commodity prices and equity market prices, and to replicate permissible investments. Refer to note 4 to the 2020 Consolidated Financial Statements for a description of the methods used to determine the fair value of derivatives.

The accounting for derivatives is complex and interpretations of the primary accounting guidance continue to evolve in practice. Judgment is applied in determining the availability and application of hedge accounting designations and the appropriate accounting treatment under such accounting guidance. Differences in judgment as to the availability and application of hedge accounting designations and the appropriate accounting treatment may result in a differing impact on the Consolidated Financial Statements of the Company from that previously reported. Assessments of hedge effectiveness and measurements of ineffectiveness of hedging relationships are also subject to interpretations and estimations. If it was determined that hedge accounting designations were not appropriately applied, reported net income attributed to shareholders could be materially affected.

Employee Future Benefits

The Company maintains defined contribution and defined benefit pension plans and other post-employment plans for employees and agents, including registered (tax qualified) pension plans that are typically funded, as well as supplemental non-registered (non-qualified) pension plans for executives, retiree welfare plans and disability welfare plans that are typically not funded. The largest defined benefit pension and retiree welfare plans in the U.S. and Canada are the material plans that are discussed herein and in note 15 to the 2020 Annual Consolidated Financial Statements.

Due to the long-term nature of defined benefit pension and retiree welfare plans, the calculation of the defined benefit obligation and net benefit cost depends on various assumptions such as discount rates, salary increase rates, cash balance interest crediting rates, health care cost trend rates and rates of mortality. These assumptions are determined by management and are reviewed annually. The key assumptions, as well as the sensitivity of the defined benefit obligation to changes in these assumptions, are presented in note 15 to the 2020 Annual Consolidated Financial Statements.

Changes in assumptions and differences between actual and expected experience give rise to actuarial gains and losses that affect the amount of the defined benefit obligation and OCI. For 2020, the amount recorded in OCI was a gain of \$47 million (2019 – gain of \$113 million) for the defined benefit pension plans and a gain of \$10 million (2019 – loss of \$21 million) for the retiree welfare plans.

Contributions to the registered (tax qualified) defined benefit pension plans are made in accordance with the applicable U.S. and Canadian regulations. During 2020, the Company contributed \$6 million (2019 – \$13 million) to these plans. As at December 31, 2020, the difference between the fair value of assets and the defined benefit obligation for these plans was a surplus of \$446 million (2019 – surplus of \$394 million). For 2021, the contributions to the plans are expected to be approximately \$2 million.¹

The Company's supplemental pension plans for executives are not funded; benefits under these plans are paid as they become due. During 2020, the Company paid benefits of \$65 million (2019 – \$62 million) under these plans. As at December 31, 2020, the defined benefit obligation for these plans, which is reflected as a liability in the balance sheet, amounted to \$752 million (2019 – \$758 million).

The Company's retiree welfare plans are partially funded, although there are no regulations or laws governing or requiring the funding of these plans. As at December 31, 2020, the difference between the fair value of plan assets and the defined benefit obligation for these plans was a deficit of \$32 million (2019 – deficit of \$47 million).

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

Income Taxes

The Company is subject to income tax laws in various jurisdictions. Tax laws are complex and potentially subject to different interpretations by the taxpayer and the relevant tax authority. The provision for income taxes represents management's interpretation of the relevant tax laws and its estimate of current and future income tax implications of the transactions and events during the period. A deferred tax asset or liability results from temporary differences between carrying values of the assets and liabilities and their respective tax basis. Deferred tax assets and liabilities are recorded based on expected future tax rates and management's assumptions regarding the expected timing of the reversal of such temporary differences. The realization of deferred tax assets depends upon the existence of sufficient taxable income within the carryback or carry forward periods under the tax law in the applicable tax jurisdiction. A deferred tax asset is recognized to the extent that future realization of the tax benefit is probable. Deferred tax assets are reviewed at each reporting date and are reduced to the extent that it is no longer probable that the tax benefit will be realized. At December 31, 2020, we had \$4,842 million of deferred tax assets (December 31, 2019 – \$4,574 million). Factors in management's determination include, among other things, the following:

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

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

Goodwill and Intangible Assets

At December 31, 2020, under IFRS we had \$5,714 million of goodwill and \$4,215 million of intangible assets (\$1,560 million of which are intangible assets with indefinite lives). Goodwill and intangible assets with indefinite lives are tested at the cash generating unit level ("CGU") or group of CGUs level. A CGU comprises the smallest group of assets that are capable of generating largely independent cash flows and is either a business segment or a level below. The tests performed in 2020 demonstrated that there was no impairment of goodwill or intangible assets with indefinite lives. Changes in discount rates and cash flow projections used in the determination of embedded values or reductions in market-based earnings multiples may result in impairment charges in the future, which could be material.

Impairment charges could occur in the future as a result of changes in economic conditions. The goodwill testing for 2021 will be updated based on the conditions that exist in 2021 and may result in impairment charges, which could be material.

Future Accounting and Reporting Changes

There are several new accounting and reporting changes issued under IFRS including those still under development by the IASB. We have summarized below key recently issued accounting standards that are anticipated to have a significant impact on the Company. Accounting and reporting changes are discussed in note 2 of the 2020 Consolidated Financial Statements.

IFRS 9 "Financial Instruments"

IFRS 9 "Financial Instruments" was issued in November 2009 and amended in October 2010, November 2013 and July 2014, and is effective for years beginning on or after January 1, 2018, to be applied retrospectively, or on a modified retrospective basis. Additionally, the IASB issued amendments in October 2017 that are effective for annual periods beginning on or after January 1, 2019. In conjunction with the amendments to IFRS 17 issued in June 2020, the IASB amended IFRS 4 "Insurance Contracts" to permit eligible insurers to apply IFRS 9 effective January 1, 2023, alongside IFRS 17. The standard is intended to replace IAS 39 "Financial Instruments: Recognition and Measurement".

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

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

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

The Company elected to defer IFRS 9 until January 1, 2023 as permitted under the amendments to IFRS 4 “Insurance Contracts”. The Company is assessing the impact of this standard.

IFRS 17 “Insurance Contracts”

The original IFRS 17 standard was issued in May 2017 and the effective date was set for years beginning on January 1, 2021. Amendments to IFRS 17 “Insurance Contracts” were issued in June 2020 and include a two-year deferral of the effective date. IFRS 17 as amended, is effective for years beginning on January 1, 2023, to be applied retrospectively. If full retrospective application to a group of contracts is impractical, the modified retrospective or fair value methods may be used. The standard will replace IFRS 4 “Insurance Contracts” and will materially change the recognition and measurement of insurance contracts and the corresponding presentation and disclosures in the Company’s Financial Statements.

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

- Under IFRS 17 the discount rate used to estimate the present value of insurance contract liabilities is based on the characteristics of the liability, whereas under CALM, the Company uses the rates of returns for current and projected assets supporting insurance contract liabilities to value the liabilities. The difference in the discount rate approach also impacts the timing of investment-related experience earnings emergence. Under CALM, investment-related experience includes the impact of investing activities. The impact of investing activities is directly related to the CALM methodology. Under IFRS 17, the impact of investing activities will emerge over the life of the asset and is independent of the liability measurement.
- Under IFRS 17 new business gains are recorded on the Consolidated Statements of Financial Position (in the contractual service margin component of the insurance contract liability) and amortized into income as services are provided, new business losses are recorded into income immediately. Under CALM new business gains (and losses) are recognized in income immediately.

The treatment of the discount rate and new business gains under IFRS 17 could create additional volatility in our financial results and depending on the LICAT treatment, on our capital position. This may require the introduction of new non-GAAP measures to explain our results.

In addition, in certain jurisdictions, including Canada, it could have a material effect on tax and regulatory capital positions and other financial metrics that are dependent upon IFRS accounting values. A summary of some of the key risks are outlined in the “Risk Factors and Risk Management – Emerging Risks” section above.

The Company continues its assessment of the implications of this standard and expects that it will have a significant impact on the Company’s Consolidated Financial Statements. The establishment of a Contractual Service Margin on our in-force business is expected to lead to an increase in insurance contract liabilities and corresponding decrease in equity upon transition. The Contractual Service Margin represents unearned profits that are expected to amortize into income as services are provided. We continue to evaluate the potential impacts of all other changes including available accounting policy choices under IFRS 17 on the measurement of our insurance contract liabilities.

12. Controls and Procedures

Disclosure Controls and Procedures

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

As of December 31, 2020, management evaluated the effectiveness of its disclosure controls and procedures as defined under the rules adopted by the U.S. Securities and Exchange Commission and the Canadian securities regulatory authorities. This evaluation was performed under the supervision of the Audit Committee, the CEO and CFO. Based on that evaluation, the CEO and CFO concluded that our disclosure controls and procedures were effective as at December 31, 2020.

MFC's Audit Committee has reviewed this MD&A and the 2020 Consolidated Financial Statements and MFC's Board of Directors approved these reports prior to their release.

Management's Report on Internal Control over Financial Reporting

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

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

Management assessed the effectiveness of the Company's internal control over financial reporting as of December 31, 2020 based on the criteria set forth by the Committee of Sponsoring Organizations of the Treadway Commission 2013 framework in Internal Control – Integrated Framework. Based on this assessment, management believes that, as of December 31, 2020, the Company's internal control over financial reporting is effective.

The effectiveness of the Company's internal control over financial reporting as of December 31, 2020 has been audited by Ernst & Young LLP, the Company's independent registered public accounting firm that also audited the Consolidated Financial Statements of the Company for the year ended December 31, 2020. Their report expressed an unqualified opinion on the effectiveness of the Company's internal control over financial reporting as of December 31, 2020.

Changes in Internal Control over Financial Reporting

No changes were made in our internal control over financial reporting during the year ended December 31, 2020 that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

13. Performance and Non-GAAP Measures

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

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

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

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

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

Items included in core earnings:

1. Expected earnings on in-force policies, including expected release of provisions for adverse deviation, fee income, margins on group business and spread business such as Manulife Bank and asset fund management.
2. Macro hedging costs based on expected market returns.
3. New business strain and gains.
4. Policyholder experience gains or losses.
5. Acquisition and operating expenses compared with expense assumptions used in the measurement of policy liabilities.
6. Up to \$400 million of net favourable investment-related experience reported in a single year, which are referred to as "core investment gains". This means up to \$100 million in the first quarter, up to \$200 million on a year-to-date basis in the second quarter, up to \$300 million on a year-to-date basis in the third quarter and up to \$400 million on a full year basis in the fourth quarter. Any investment-related experience losses reported in a quarter will be offset against the net year-to-date investment-related experience gains with the difference being included in core earnings subject to a maximum of the year-to-date core investment gains and a minimum of zero, which reflects our expectation that investment-related experience will be positive through-the-business cycle. To the extent any investment-related experience losses cannot be fully offset in a quarter they will be carried forward to be offset against investment-related experience gains in subsequent quarters in the same year, for purposes of determining core investment gains. Investment-related experience relates to fixed income investing, ALDA returns, credit experience and asset mix changes other than those related to a strategic change. An example of a strategic asset mix change is outlined below.
 - This favourable and unfavourable investment-related experience is a combination of reported investment experience as well as the impact of investing activities on the measurement of our policy liabilities. We do not attribute specific components of investment-related experience to amounts included or excluded from core earnings.
 - The \$400 million threshold represents the estimated average annualized amount of net favourable investment-related experience that the Company reasonably expects to achieve through-the-business cycle based on historical experience. It is not a forecast of expected net favourable investment-related experience for any given fiscal year.
 - Our average net annualized investment-related experience calculated from the introduction of core earnings in 2012 to the end of 2020 was \$380 million a decrease from the average of \$527 million (2012-2019) due to losses on investment-related experience (compared with average gains in prior years, including the core investment gains).

- The decision announced on December 22, 2017 to reduce the allocation to ALDA in the portfolio asset mix supporting our legacy businesses was the first strategic asset mix change since we introduced the core earnings metric in 2012. We refined our description of investment-related experience in 2017 to note that asset mix changes other than those related to a strategic change are taken into consideration in the investment-related experience component of core investment gains.
 - While historical investment return time horizons may vary in length based on underlying asset classes generally exceeding 20 years, for purposes of establishing the threshold, we look at a business cycle that is five or more years and includes a recession. We monitor the appropriateness of the threshold as part of our annual five-year planning process and would adjust it, either to a higher or lower amount, in the future if we believed that our threshold was no longer appropriate.
 - Specific criteria used for evaluating a potential adjustment to the threshold may include, but are not limited to, the extent to which actual investment-related experience differs materially from actuarial assumptions used in measuring insurance contract liabilities, material market events, material dispositions or acquisitions of assets, and regulatory or accounting changes.
7. Earnings on surplus other than mark-to-market items. Gains on available-for-sale (“AFS”) equities and seed money investments in segregated and mutual funds are included in core earnings.
 8. Routine or non-material legal settlements.
 9. All other items not specifically excluded.
 10. Tax on the above items.
 11. All tax related items except the impact of enacted or substantively enacted income tax rate changes.

Items excluded from core earnings:

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

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

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

The Company also uses financial performance measures that are prepared on a **constant exchange rate basis**, which are non-GAAP measures that exclude the impact of currency fluctuations (from local currency to Canadian dollars at a total Company level and from local currency to U.S. dollars in Asia). Amounts stated on a constant exchange rate basis in this report are calculated, as appropriate, using the income statement and balance sheet exchange rates effective for the fourth quarter of 2020. Measures that are reported on a constant exchange rate basis include growth in core earnings, core general expenses, pre-tax core earnings, sales, APE sales, gross flows, net flows, core EBITDA, new business value, new business value margin, assets under management, assets under management and administration, average assets under management and administration and Global Wealth and Asset Management revenue.

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

Assets under management and administration

As at December 31,
(\$ millions)

	2020	2019
Total invested assets	\$ 410,977	\$ 378,527
Segregated funds net assets	367,436	343,108
Assets under management per financial statements	778,413	721,635
Mutual funds	238,068	217,015
Institutional advisory accounts (excluding segregated funds)	107,387	95,410
Other funds	10,880	9,401
Total assets under management	1,134,748	1,043,461
Other assets under administration	162,688	145,397
Currency impact	-	(12,039)
AUMA at constant exchange rates	\$ 1,297,436	\$ 1,176,819

Average assets under management and administration (“average AUMA”) is a non-GAAP measure of the average of Global WAM’s AUMA during the reporting period. It is a measure used in analyzing and explaining fee income and earnings of our Global Wealth and Asset Management segment. It is calculated as the average of the opening balance of AUMA and the ending balance of AUMA using daily balances where available and month-end or quarter-end averages when daily averages are unavailable.

Consolidated capital

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

Consolidated capital

As at December 31,
(\$ millions)

	2020	2019
Total equity	\$ 53,005	\$ 50,106
Add AOCI loss on cash flow hedges	230	143
Add qualifying capital instruments	7,829	7,120
Consolidated capital	\$ 61,064	\$ 57,369

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

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

Global Wealth and Asset Management

For the years ended December 31,

(\$ millions)

	2020	2019
Core EBITDA	\$ 1,680	\$ 1,536
Amortization of deferred acquisition costs and other depreciation	(320)	(311)
Amortization of deferred sales commissions	(85)	(81)
Core earnings before income taxes	1,275	1,144
Core income tax (expense) recovery	(172)	(123)
Core earnings	\$ 1,103	\$ 1,021
Core EBITDA	\$ 1,680	\$ 1,536
Revenue	5,749	5,595
Core EBITDA Margin	29.2%	27.5%

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

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

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

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

Sales are measured according to product type:

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

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

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

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

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

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

Net flows is presented for our Global WAM business and includes gross flows less redemptions for mutual funds, college savings 529 plans, group pension/retirement savings products, private wealth and institutional asset management products. Net flows is a common industry metric for WAM businesses as it provides a measure of how successful the businesses are at attracting and retaining assets. When gross flows exceed redemptions, net flows will be positive and will be referred to as net inflows. Conversely, when redemptions exceed gross flows, net flows will be negative and will be referred to as net outflows.

14. Additional Disclosures

Contractual Obligations

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

As at December 31, 2020, the Company's contractual obligations and commitments were as follows:

Payments due by period (\$ millions)	Total	Less than 1 year	1 to 3 years	3 to 5 years	After 5 years
Long-term debt ⁽¹⁾	\$ 11,342	\$ 243	\$ 486	\$ 486	\$ 10,127
Liabilities for capital instruments ⁽¹⁾	9,611	598	463	924	7,626
Investment commitments	9,937	3,272	3,401	2,759	505
Lease liabilities	353	116	115	47	75
Insurance contract liabilities ⁽²⁾	827,727	10,672	9,859	15,416	791,780
Investment contract liabilities ⁽¹⁾	5,551	297	514	520	4,220
Deposits from bank clients	20,889	16,783	2,591	1,515	-
Other	1,126	300	615	203	8
Total contractual obligations	\$ 886,536	\$ 32,281	\$ 18,044	\$ 21,870	\$ 814,341

⁽¹⁾ The contractual payments include principal, interest and distributions; and reflect the amounts payable up to and including the final contractual maturity date. The contractual payments reflect the amounts payable from January 1, 2021 up to and including the final contractual maturity date. In the case of floating rate obligations, the floating rate index is based on the interest rates as at December 31, 2020 and is assumed to remain constant to the final contractual maturity date. The Company may have the contractual right to redeem or repay obligations prior to maturity and if such right is exercised, total contractual obligations paid and the timing of payment could vary significantly from the amounts and timing included in the table. We redeemed \$0.35 billion of 2.389% Fixed/Floating Subordinated Debentures on January 5, 2021. This redemption has been reflected in the contractual payments.

⁽²⁾ Insurance contract liabilities cash flows include estimates related to the timing and payment of death and disability claims, policy surrenders, policy maturities, annuity payments, minimum guarantees on segregated fund products, policyholder dividends, commissions and premium taxes offset by contractual future premiums on in-force contracts. These estimated cash flows are based on the best estimate assumptions used in the determination of insurance contract liabilities. These amounts are undiscounted and reflect recoveries from reinsurance agreements. Due to the use of assumptions, actual cash flows may differ from these estimates (see "Policy Liabilities"). Cash flows include embedded derivatives measured separately at fair value.

Legal and Regulatory Proceedings

We are regularly involved in legal actions, both as a defendant and as a plaintiff. Information on legal and regulatory proceedings can be found in note 18 of the 2020 Annual Consolidated Financial Statements.

Quarterly Financial Information

The following table provides summary information related to our eight most recently completed quarters:

As at and for the three months ended (\$ millions, except per share amounts or otherwise stated)	Dec 31, 2020	Sept 30, 2020	Jun 30, 2020	Mar 31, 2020	Dec 31, 2019	Sept 30, 2019	Jun 30, 2019	Mar 31, 2019
Revenue								
Premium income								
Life and health insurance ⁽¹⁾	\$ 8,651	\$ 5,302	\$ 7,560	\$ 8,454	\$ 8,373	\$ 8,309	\$ 7,696	\$ 8,077
Annuities and pensions	672	704	673	901	865	1,026	995	237
Net premium income	9,323	6,006	8,233	9,355	9,238	9,335	8,691	8,314
Investment income	4,366	3,521	5,262	3,284	4,004	3,932	3,710	3,747
Realized and unrealized gains and losses on assets supporting insurance and investment contract liabilities ⁽²⁾	1,683	1,100	11,626	4,558	(4,503)	6,592	7,185	8,926
Other revenue	2,497	2,749	2,365	2,980	2,433	2,770	2,634	2,562
Total revenue	\$ 17,869	\$ 13,376	\$ 27,486	\$ 20,177	\$ 11,172	\$ 22,629	\$ 22,220	\$ 23,549
Income (loss) before income taxes	\$ 2,065	\$ 2,170	\$ 832	\$ 1,704	\$ 1,225	\$ 715	\$ 1,756	\$ 2,524
Income tax (expense) recovery	(224)	(381)	7	(597)	(89)	(100)	(240)	(289)
Net income (loss)	\$ 1,841	\$ 1,789	\$ 839	\$ 1,107	\$ 1,136	\$ 615	\$ 1,516	\$ 2,235
Net income (loss) attributed to shareholders	\$ 1,780	\$ 2,068	\$ 727	\$ 1,296	\$ 1,228	\$ 723	\$ 1,475	\$ 2,176
Reconciliation of core earnings to net income attributed to shareholders								
Total core earnings ⁽³⁾	\$ 1,474	\$ 1,453	\$ 1,561	\$ 1,028	\$ 1,477	\$ 1,527	\$ 1,452	\$ 1,548
Other items to reconcile net income attributed to shareholders to core earnings:								
Investment-related experience outside of core earnings	585	147	(916)	(608)	182	(289)	146	327
Direct impact of equity markets, interest rates and variable annuity guarantee liabilities	(323)	390	73	792	(389)	(494)	(144)	249
Change in actuarial methods and assumptions	–	(198)	–	–	–	(21)	–	–
Reinsurance transactions	44	276	9	12	(34)	–	63	52
Tax-related items and other	–	–	–	72	(8)	–	(42)	–
Net income (loss) attributed to shareholders	\$ 1,780	\$ 2,068	\$ 727	\$ 1,296	\$ 1,228	\$ 723	\$ 1,475	\$ 2,176
Basic earnings (loss) per common share	\$ 0.90	\$ 1.04	\$ 0.35	\$ 0.64	\$ 0.61	\$ 0.35	\$ 0.73	\$ 1.09
Diluted earnings (loss) per common share	\$ 0.89	\$ 1.04	\$ 0.35	\$ 0.64	\$ 0.61	\$ 0.35	\$ 0.73	\$ 1.08
Segregated funds deposits	\$ 9,741	\$ 9,158	\$ 8,784	\$ 11,215	\$ 9,417	\$ 9,160	\$ 9,398	\$ 10,586
Total assets (in billions)	\$ 880	\$ 876	\$ 866	\$ 831	\$ 809	\$ 812	\$ 790	\$ 780
Weighted average common shares (in millions)	1,940	1,940	1,939	1,943	1,948	1,961	1,965	1,965
Diluted weighted average common shares (in millions)	1,943	1,942	1,941	1,947	1,953	1,965	1,969	1,969
Dividends per common share	\$ 0.280	\$ 0.280	\$ 0.280	\$ 0.280	\$ 0.250	\$ 0.250	\$ 0.250	\$ 0.250
CDN\$ to US\$1 — Statement of Financial Position	1.2732	1.3339	1.3628	1.4187	1.2988	1.3243	1.3087	1.3363
CDN\$ to US\$1 — Statement of Income	1.3030	1.3321	1.3854	1.3449	1.3200	1.3204	1.3377	1.3295

⁽¹⁾ Includes ceded premiums related to the reinsurance of a block of our legacy U.S. Bank-Owned Life Insurance of US\$2.4 billion in 3Q20.

⁽²⁾ For fixed income assets supporting insurance and investment contract liabilities and for equities supporting pass-through products and derivatives related to variable hedging programs, the impact of realized and unrealized gains (losses) on the assets is largely offset in the change in insurance and investment contract liabilities.

⁽³⁾ This item is a non-GAAP measure. See “Performance and Non-GAAP Measures” above.

Selected Annual Financial Information

As at and for the years ended December 31,
(\$ millions, except per share amounts)

	2020	2019	2018
Revenue			
Asia	\$ 28,455	\$ 28,673	\$ 19,710
Canada	18,638	19,609	13,598
U.S.	23,361	24,594	586
Global Wealth and Asset Management	5,749	5,595	5,463
Corporate and Other	2,705	1,099	(385)
Total revenue	\$ 78,908	\$ 79,570	\$ 38,972
Total assets	\$ 880,349	\$ 809,130	\$ 750,271
Long-term financial liabilities			
Long-term debt	\$ 6,164	\$ 4,543	\$ 4,769
Capital instruments	7,829	7,120	8,732
Total financial liabilities	\$ 13,993	\$ 11,663	\$ 13,501
Dividend per common share	\$ 1.12	\$ 1.00	\$ 0.91
Cash dividend per Class A Share, Series 2	1.1625	1.1625	1.1625
Cash dividend per Class A Share, Series 3	1.125	1.125	1.125
Cash dividend per Class 1 Share, Series 3	0.5445	0.5445	0.5445
Cash dividend per Class 1 Share, Series 4	0.587	0.7713	0.6536
Cash dividend per Class 1 Share, Series 5	0.9728	0.9728	0.9728
Cash dividend per Class 1 Share, Series 7	1.078	1.078	1.078
Cash dividend per Class 1 Share, Series 9	1.0878	1.0878	1.0878
Cash dividend per Class 1 Share, Series 11	1.1828	1.1828	1.1371
Cash dividend per Class 1 Share, Series 13	1.1035	1.1035	0.9884
Cash dividend per Class 1 Share, Series 15	0.9465	0.9608	0.975
Cash dividend per Class 1 Share, Series 17	0.950	0.975	0.975
Cash dividend per Class 1 Share, Series 19	0.9266	0.95	0.95
Cash dividend per Class 1 Share, Series 21	1.400	1.40	1.40
Cash dividend per Class 1 Share, Series 23	1.2125	1.2125	1.2125
Cash dividend per Class 1 Share, Series 25 ⁽¹⁾	1.175	1.175	0.9706

⁽¹⁾ On February 20, 2018, MFC issued 10 million of Non-cumulative Rate Reset Class 1 Shares Series 25.

Differences between IFRS and Hong Kong Financial Reporting Standards

Manulife's Consolidated Financial Statements are presented in accordance with IFRS. IFRS differs in certain respects from Hong Kong Financial Reporting Standards ("HKFRS"). Until IFRS 17 "Insurance Contracts" becomes effective, IFRS 4 "Insurance Contracts" permits the use of the insurance standard in effect at the time an issuer adopts IFRS. IFRS insurance contract liabilities are valued in Canada under standards established by the Canadian Actuarial Standards Board. In certain interest rate environments, insurance contract liabilities determined in accordance with HKFRS may be higher than those computed in accordance with current IFRS.

IFRS and Hong Kong Regulatory Requirements

Insurers in Hong Kong are required by the Insurance Authority to meet minimum solvency requirements. As at December 31, 2020, the Company's business that falls within the scope of these requirements has sufficient assets to meet the minimum solvency requirements under both Hong Kong regulatory requirements and IFRS.

Outstanding Common Shares

As at January 31, 2021, MFC had 1,940,458,689 common shares outstanding.

Additional Information Available

Additional information relating to Manulife, including MFC's Annual Information Form, is available on the Company's website at www.manulife.com and on SEDAR at www.sedar.com.