Manulife

Manulife Financial Corporation
Management's Discussion & Analysis

For the year ended December 31, 2022

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 possible share buybacks under our normal course issuer bid, expected expense savings in 2023 related to actions taken in 2021, the Company's strategic priorities and 2025 targets for its highest potential businesses, net promoter score, straight-through-processing, ongoing expense efficiency, portfolio optimization, employee engagement, its medium-term financial and operating targets, its ability to achieve our financed emissions and absolute scope 1 and 2 emissions targets, its ability to manage its long-term care and variable annuity blocks of business to maturity and its ability to secure future premium rate increases in respect of its long-term care policies 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, inflation rates, currency rates, investment losses and defaults, market liquidity and creditworthiness of guarantors, reinsurers and counterparties); the ongoing prevalence of COVID-19, including any variants, as well as actions that have been, or may be taken by governmental authorities in response to COVID-19, including the impacts of any variants; 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 obtain premium rate increases on in-force policies; 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; geopolitical uncertainty, including international conflicts; 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 including climate change; our ability to protect our intellectual property and exposure to claims of infringement; and our inability to withdraw cash from subsidiaries.

Additional information about material risk factors that could cause actual results to differ materially from expectations and about material factors or assumptions applied in making forward-looking statements may be found in this document under "Risk Management and Risk Factors" 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.

Contents

Management's Discussion and Analysis

This Management's Discussion and Analysis ("MD&A") is current as of February 15, 2023.

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 Asia, Canada, 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 2022, we had more than 40,000 employees, over 116,000 agents, and thousands of distribution partners, serving over 34 million customers. At the end of 2022, we had $1.3 trillion (US$1.0 trillion) in assets under management and administration[1], including total invested assets of $0.4 trillion (US$0.3 trillion), and segregated funds net assets of $0.3 trillion (US$0.3 trillion). 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 and 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 investment advice and innovative solutions to our retail, retirement and institutional clients around the world under the Manulife Investment Management ("MIM") brand.
- 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)

	2022	2021
Net income attributed to shareholders	**$ 7,294**	$ 7,105
Core earnings(1)	**$ 6,182**	$ 6,536
Diluted earnings per common share ($)	**$ 3.68**	$ 3.54
Diluted core earnings per common share ($)(2)	**$ 3.10**	$ 3.25
Return on common shareholders' equity ("ROE")	**14.1%**	14.2%
Core ROE(2)	**11.9%**	13.0%
Expense efficiency ratio(2)	**50.9%**	48.9%
General expenses	**$ 7,782**	$ 7,828

(1) This item is a non-GAAP financial measure. See "Non-GAAP and Other Financial Measures" below for more information.
(2) This item is a non-GAAP ratio. See "Non-GAAP and Other Financial Measures" below for more information.

Our net income attributed to shareholders was $7.3 billion in 2022 compared with $7.1 billion in 2021. 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 $6.2 billion in 2022 compared with $6.5 billion in 2021, and items excluded from core earnings of $1.1 billion of net gains in 2022 compared with $0.6 billion of net gains in 2021.

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[1] This item is a non-GAAP financial measure. See "Non-GAAP and Other Financial Measures" below for more information.

The $0.2 billion increase in net income attributed to shareholders in 2022 compared with 2021 was driven by gains related to the two U.S. variable annuity reinsurance transactions and the favourable impact of an increase in the Canadian corporate tax rate, partially offset by lower gains from investment-related experience and lower core earnings. Investment-related experience gains in 2022 reflected the favourable impact of fixed income reinvestment activities, strong credit experience and higher-than-expected returns (including fair value changes) on alternative long duration assets ("ALDA") primarily driven by private equity, infrastructure, and timberland, partially offset by real estate. The net charge from the direct impact of markets in 2022 was primarily driven by the impact of unfavourable equity market performance and losses from the sale of available-for-sale ("AFS") bonds, partially offset by gains due to flattening of the yield curve in the U.S. and Canada.

The $0.4 billion or 7%[1] decrease in core earnings on a constant exchange rate basis compared with 2021 was driven by lower new business gains in Asia and the U.S., losses from the unfavourable impact of markets on seed money investments in new and segregated mutual funds of $159 million in 2022 (compared with gains of $27 million in 2021) and lower net gains on the sale of AFS equities in Corporate and Other, lower net fee income from lower average assets under management and administration[2] ("average AUMA") in Global WAM, lower in-force earnings in U.S. Annuities of $191 million due to the variable annuity reinsurance transactions and higher charges in our P&C Reinsurance business in 2022. These items were partially offset by higher yields on fixed income investments and lower expenses in Corporate and Other, in-force business growth in Asia and Canada and experience gains in Canada compared with losses in 2021. Lower expenses in Corporate and Other were primarily driven by lower supplemental pension expense due to market impacts. In 2022, core earnings included a net charge of $143 million ($152 million pre-tax) related to policyholder insurance and annuity experience compared with a net charge of $110 million ($127 million pre-tax) in 2021.[3] Actions to improve the capital efficiency of our legacy business resulted in $191 million lower core earnings in 2022 compared with 2021. Excluding these actions, in-force business increased 6%[4] compared with 2021.

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)	**2022**	2021	% change(1) 2022 vs 2021
Core earnings by segment			
Asia	**$ 2,132**	$ 2,176	(2)%
Canada	**1,359**	1,179	15%
U.S.	**1,700**	1,936	(15)%
Global Wealth and Asset Management	**1,241**	1,406	(14)%
Corporate and Other (excluding core investment gains)	**(650)**	(561)	(16)%
Core investment gains(2)	**400**	400	–
Total core earnings	**$ 6,182**	$ 6,536	(7)%

(1) Percentage change in core earnings on a constant exchange rate basis is a non-GAAP ratio. See "Non-GAAP and Other Financial Measures" below for more information.
(2) See note (2) in the table below. This item is disclosed under the Office of the Superintendent of Financial Institution's ("OSFI's") Source of Earnings Disclosure (Life Insurance Companies) guideline.

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[1] Percentage growth / declines in core earnings, core general expenses, pre-tax core earnings, assets under management and administration, assets under management, core EBITDA, general expenses, Manulife Bank average net lending assets and Global Wealth and Asset Management revenue are stated on a constant exchange rate basis, a non-GAAP ratio. See "Non-GAAP and Other Financial Measures" below for more information.

[2] For more information on this metric, see "Non-GAAP and Other Financial Measures" below.

[3] Policyholder experience includes gains of $20 million post-tax in 2022 (2021 – gains of $29 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.

[4] Excludes $243 million (pre-tax) in 2022 of lost expected profit on in-force relating to the U.S. variable annuity reinsurance transaction. Percentage growth is based on the pre-tax impact of these actions, and is stated on a constant exchange rate basis.

The table below presents 2022 and 2021 net income attributed to shareholders consisting of core earnings and items excluded from core earnings.

For the years ended December 31, ($ millions)	2022	2021
Core earnings	**$ 6,182**	$ 6,536
Items excluded from core earnings:(1)		
Investment-related experience outside of core earnings(2)	**817**	1,642
Direct impact of equity markets and interest rates and variable annuity guarantee liabilities	**(840)**	(817)
Direct impact of equity markets and variable annuity guarantee liabilities(3)	***(995)***	*289*
Fixed income reinvestment rates assumed in the valuation of policy liabilities(4)	***576***	*(346)*
Sale of AFS bonds and derivative positions in the Corporate and Other segment(4)	***(421)***	*(228)*
Changes to the ultimate reinvestment rate(5)	**–**	*(532)*
Change in actuarial methods and assumptions(6)	**36**	(41)
Restructuring charge(7)	**–**	(115)
Reinsurance transactions, tax-related items and other(8)	**1,099**	(100)
Total items excluded from core earnings	**1,112**	569
Net income attributed to shareholders	**$ 7,294**	$ 7,105

(1) These items are disclosed under OSFI's Source of Earnings Disclosure (Life Insurance Companies) guideline.

(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 "Non-GAAP and Other Financial 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 2022, the investment-related experience net gain of $817 million reflected the favourable impact of fixed income reinvestment activities, strong credit experience, and higher-than-expected returns (including fair value changes) on ALDA primarily driven by private equity, infrastructure, and timberland, partially offset by real estate. In 2021, the investment-related experience net gain of $1,642 million reflected higher-than-expected returns (including fair value changes) on ALDA primarily driven by gains on private equity and infrastructure, strong credit experience and the favourable impact of fixed income reinvestment activities.

(3) In 2022, the net charge related to equity markets of $995 million included a charge of $893 million from gross equity exposure and a charge of $111 million from dynamic hedge experience, partially offset by a modest gain of $9 million from macro hedging experience. In 2021, the net gain of $289 million included a gain of $382 million from gross equity exposure, partially offset by a charge of $90 million from dynamic hedge experience and a modest charge of $3 million from macro hedging experience.

(4) In 2022, the gain due to fixed income reinvestment rates of $576 million was primarily due to the flattening of the yield curve in the U.S. and Canada, partially offset by losses on the sale of available-for-sale bonds. In 2021, the charge due to fixed income reinvestment rates of $346 million was primarily due to the increase in risk-free interest rates and the overall steepening of the yield curve in the U.S. and Canada.

(5) In 2021, the Canadian Actuarial Standards Board issued a new promulgation with reductions to the ultimate reinvestment rate ("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 and was effective October 15, 2021. The long-term URR for risk-free rates in Canada is prescribed at 2.9% and we use the same assumption for the U.S. Our assumption for Japan is 1.5%.

(6) See "Critical Actuarial and Accounting Policies – Review of Actuarial Methods and Assumptions" section below for further information on the 2022 and 2021 charges.

(7) In 2021, we reported a restructuring charge of $150 million pre-tax ($115 million post-tax) related to actions that are expected to result in recurring total annual expense savings of $250 million (pre-tax) by 2023; $100 million (pre-tax) of these expected total annual savings were realized in 2021, $200 million (pre-tax) were realized in 2022, and $250 million (pre-tax) are expected to be realized in 2023.[1]

(8) In 2022, the $1,099 million of gain included a net gain of $846 million from the U.S. variable annuity reinsurance transactions and a net gain of $86 million related to acquiring full ownership interest of Manulife TEDA Fund Management Co., LTD ("MTEDA") by purchasing the remaining 51% of shares from our joint venture partner, partially offset by a charge of $71 million related to withholding tax on anticipated remittances resulting from the U.S. variable annuity reinsurance transaction, a charge of $17 million resulting from a reinsurance transaction in Asia, a $13 million increase to an existing legal provision in the U.S. and an integration charge of $8 million in our Vietnam operation. In addition, we reported tax benefits of $297 million in 2022 as a result of an increase in the Canadian corporate tax rate. In 2021, the $100 million net charge included a $119 million charge relating to updating the impact of the 2017 U.S. Tax Cuts and Jobs Act and a $37 million charge resulting from a reinsurance transaction in the U.S., partially offset by a $37 million gain related to affiliate reinsurance transactions in Asia and a $19 million gain related to the divestment of our Thailand operation.

Net income attributed to shareholders 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)	2022	2021	% change(1) 2022 vs 2021
Net income attributed to shareholders by segment			
Asia	**$ 2,224**	$ 3,057	(27)%
Canada	**1,530**	1,354	13%
U.S.	**3,950**	2,080	90%
Global Wealth and Asset Management	**1,321**	1,406	(6)%
Corporate and Other	**(1,731)**	(792)	(119)%
Total net income attributed to shareholders	**$ 7,294**	$ 7,105	3%

(1) Percentage change is on an actual exchange rate basis.

Diluted earnings per common share was $3.68 in 2022, compared with $3.54 in 2021 primarily related to the increase in net income attributed to common shareholders. Diluted core earnings per common share was $3.10 in 2022, compared with $3.25 in 2021 primarily related to the decrease in core earnings. The diluted weighted average common shares outstanding was 1,913 million in 2022 and 1,946 million in 2021.

Return on common shareholders' equity ("ROE") for 2022 was 14.1%, compared with 14.2% for 2021 and core return on common shareholders' equity ("core ROE") was 11.9% in 2022 compared with 13.0% in 2021. The decrease in 2022 ROE and core ROE were primarily driven by a decrease in common shareholders' core earnings.

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

Expense efficiency ratio was 50.9% for 2022, compared with 48.9% in 2021. The 2.0 percentage point increase in the ratio compared with 2021 was driven by an 8% decrease in pre-tax core earnings[1]. Core general expenses[1] were in line with 2021 driven by higher workforce costs offset by the net favourable impact of our strategic focus on digitization and efficiency, lower distribution-related and discretionary expenses reflecting lower 2022 sales, and lower pension costs primarily due to market impacts.

Total general expenses in 2022 were in line with 2021 on both a constant and actual exchange rate basis due to the items noted above for core general expenses and a number of items recorded outside of core earnings. These include the non-recurrence of a restructuring charge and the establishment of a legal provision in 2021, partially offset by various 2022 items, including an integration charge in our Vietnam operation, expenses associated with the U.S. variable annuity reinsurance transactions, and a legal provision in the U.S.

Business Performance

Business performance

As at and for the years ended December 31, ($ millions, unless otherwise stated)	**2022**	2021
Asia APE sales	**$ 3,569**	$ 4,050
Canada APE sales	**1,261**	1,227
U.S. APE sales	**823**	788
Total APE sales(1)	**5,653**	6,065
Asia new business value	**1,349**	1,666
Canada new business value	**362**	307
U.S. new business value	**352**	270
Total new business value(1)	**2,063**	2,243
Global Wealth and Asset Management gross flows ($ billions)(1)	**136.6**	144.7
Global Wealth and Asset Management net flows ($ billions)(1)	**3.3**	27.9
Global Wealth and Asset Management assets under management and administration ($ billions)(2),(3)	**779.9**	855.9
Global Wealth and Asset Management total invested assets ($ billions)(3)	**3.7**	4.5
Global Wealth and Asset Management segregated funds net assets ($ billions)(3)	**224.2**	252.6
Total assets under management and administration ($ billions)	**1,314.6**	1,425.8
Total invested assets ($ billions)	**414.0**	427.1
Total net segregated funds net assets ($ billions)	**348.6**	399.8

(1) For more information on this metric, see "Non-GAAP and Other Financial Measures" below.

(2) This item is a non-GAAP financial measure. See "Non-GAAP and Other Financial Measures" below for more information.

(3) The Global WAM portion of AUMA as at December 31, 2022 was $779.9 billion, a decrease of 9% compared with December 31, 2021, driven by the impact of higher interest rates and equity market declines, partially offset by $8.8 billion in assets acquired and net inflows of $3.3 billion. The Global WAM segregated funds net assets were $224.2 billion as at December 31, 2022, a decline of 11% compared with December 31, 2021 on an actual exchange rate basis driven by the impact of higher interest rates and equity market declines.

Annualized premium equivalent ("APE") sales were $5.7 billion in 2022, a decrease of 7%[2] compared with 2021. In Asia, COVID-19 continued to impact sales in select markets throughout the year, with the situation beginning to improve in most markets, as containment measures were progressively relaxed. Travel restrictions between mainland China and, Hong Kong and Macau impacted cross-border commerce in 2022. Weaker customer sentiment negatively impacted sales in the second half of the year. Asia APE sales declined 12% compared with 2021, due to decreases experienced in Hong Kong, Japan, Vietnam and Other Emerging Markets[3], partially offset by increases in mainland China and Singapore. In Hong Kong, APE sales decreased 33% compared with 2021, primarily reflecting weaker customer sentiment on financial planning decisions and continued COVID-19 containment measures through most of the year. In Japan, APE sales decreased 15% compared with 2021, reflecting lower corporate-owned life insurance ("COLI") product sales, partially offset by higher individual protection and other wealth sales. Vietnam APE sales decreased 9% compared with 2021, reflecting a decline in the agency channel, partially offset by growth in the bank channel. Other Emerging Markets APE sales decreased 4% compared with 2021, reflecting a decline in the agency and bank channels. Mainland China APE sales increased 4% compared with 2021, driven by growth in the bank channel, partially offset by a decline in the agency channel. Singapore APE sales increased 1% compared with 2021, reflecting growth in the bank channel offset by a decline in the broker channel. In Canada, APE sales increased 3% compared with 2021, primarily driven by higher sales in group insurance, participating insurance and travel insurance, partially offset by the impact of market volatility on the demand for segregated fund products, and lower universal life and health and dental sales. In the U.S., APE sales increased 1% compared with 2021, due to an increase in international sales which are reported as part of U.S. segment results, partially offset by lower sales of domestic life insurance products. APE sales of products with the John Hancock Vitality PLUS feature were a record-setting US$332 million, an increase of 13% compared with 2021, reflecting the increasing attractiveness of the Vitality feature as an option for health-focused life insurance consumers.

New business value ("NBV") was $2.1 billion in 2022, a decrease of 9% compared with 2021. In Asia, NBV was $1.3 billion in 2022, a decrease of 20% compared with 2021, due to lower NBV in Hong Kong, Singapore and mainland China, partially offset by higher NBV in

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[1] This item is a non-GAAP financial measure. See "Non-GAAP and Other Financial Measures" below for more information.

[2] Percentage growth / declines in APE sales, gross flows, and NBV are stated on a constant exchange rate basis.

[3] Other Emerging Markets includes Indonesia, the Philippines, Malaysia, Thailand, Cambodia, and Myanmar.

Japan and Other Emerging Markets. NBV in Hong Kong decreased 27% compared with 2021, reflecting lower sales volumes, partially offset by favourable product mix and the impact of higher interest rates. NBV in Singapore and mainland China decreased 19% and 58%, respectively, compared with 2021, reflecting changes in product mix. NBV in Vietnam was in line compared with 2021, as the impact of favourable product mix was offset by lower sales volumes. NBV in Japan and Other Emerging Markets increased 28% and 5%, respectively, compared with 2021, reflecting favourable product mix, partially offset by lower sales volumes. In Canada, NBV of $362 million increased 18% compared with 2021, driven by higher margins across all businesses and higher group insurance volumes, partially offset by lower volumes in annuities. In the U.S., NBV of $352 million increased 25% compared with 2021, driven by higher interest rates, higher international sales volumes and product actions partially offset by lower brokerage sales volumes.

Global WAM gross flows of $136.6 billion decreased $8.1 billion or 7% compared with 2021, primarily driven by lower gross flows in Retail. See "Global Wealth and Asset Management" section below for further details.

Global WAM net inflows were $3.3 billion in 2022, compared with net inflows of $27.9 billion in 2021. Net outflows in Retirement were $0.1 billion compared with net inflows of $1.1 billion in the prior year, driven by higher plan redemptions in the U.S. Net outflows in Retail were $1.6 billion compared with net inflows of $29.2 billion in the prior year, reflecting higher redemptions and lower gross flows due to decreased investor demand amid higher interest rates and equity market declines in 2022. Net inflows in Institutional Asset Management were $5.0 billion compared with net outflows of $2.4 billion in the prior year, driven by the non-recurrence of a $9.4 billion redemption in 2021 and higher equity mandate gross flows mainly from a $1.9 billion sale in the second quarter of 2022 ("2Q22").

Assets under Management and Administration ("AUMA")

AUMA as at December 31, 2022 was $1.3 trillion, a decrease of 11% compared with December 31, 2021, primarily due to the impact of higher interest rates and lower equity markets. Total invested assets and segregated funds net assets decreased 3% and 13%, respectively, on an actual exchange rate basis, primarily due to the impact of higher interest rates and lower equity markets.

Assets under Management and Administration

As at December 31, ($ millions)	**2022**	2021
Total invested assets	**$ 414,001**	$ 427,098
Segregated funds net assets[1]	**348,562**	399,788
Mutual funds, institutional asset management and other[1],[2]	**381,779**	411,271
Total assets under management	**1,144,342**	1,238,157
Other assets under administration	**170,224**	187,631
Total assets under management and administration	**$ 1,314,566**	$ 1,425,788

(1) These assets 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 2022, revenue before realized and unrealized investment gains and losses was $62.2 billion compared with $65.8 billion in 2021. The decrease was driven primarily by the 2022 U.S. variable annuity reinsurance transactions, which impacted other revenue and ceded premiums, as well as from unfavourable markets.

In 2022, the net realized and unrealized investment gains and losses on assets supporting insurance and investment contract liabilities and on the macro hedging program was a charge of $45.1 billion compared with a charge of $4.0 billion for 2021. The 2022 charge was primarily due to the impact of interest rate increases and lower equity markets partially offset by fair value gains on ALDA. The 2021 charge was primarily due to the impact of interest rate increases partially offset by fair value gains on ALDA and higher equity markets.

See "Impact of Fair Value Accounting" below. Also, see "Profitability" above for additional information on the impact on 2022 net income attributed to shareholders from the direct impact of equity markets and interest rates and variable annuity guarantee liabilities.

Revenue

For the years ended December 31, ($ millions)	2022	2021
Gross premiums	$ 44,102	$ 44,344
Premiums ceded to reinsurers	(6,249)	(5,279)
Net premium income	37,853	39,065
Investment income	15,207	15,627
Other revenue	9,164	11,132
Revenue before realized and unrealized investment gains and losses	62,224	65,824
Realized and unrealized investment gains and losses on assets supporting insurance and investment contract liabilities and on the macro hedge program(1)	(45,077)	(4,003)
Total revenue	$ 17,147	$ 61,821

(1) See "Impact of Fair Value Accounting" section below. Also see "Profitability – Items excluded from core earnings" section above for information on direct impact of equity markets and interest rates and variable annuity guarantee liabilities.

Financial Strength

Financial strength metrics

As at and for the years ended December 31, ($ millions, unless otherwise stated)	2022	2021
MLI's LICAT ratio(1)	131%	142%
Financial leverage ratio	27.7%	25.8%
Consolidated capital(2)	$ 62,493	$ 66,005
Book value per common share ($)	$ 26.49	$ 26.78
Book value per common share excluding accumulated other comprehensive income ($)	$ 26.50	$ 24.12

(1) This item is disclosed under OSFI's Life Insurance Capital Adequacy Test Public Disclosure Requirements guideline.

(2) This item is a capital management measure. For more information on this metric, see "Non-GAAP and Other Financial Measures" below.

The Life Insurance Capital Adequacy Test ("LICAT") ratio for MLI was 131% as at December 31, 2022, compared with 142% as at December 31, 2021. The 11 percentage point decrease from December 31, 2021 was driven by the unfavourable impact of market movements on capital primarily from the large increase in risk-free interest rates, and from common share buybacks, partially offset by the favourable impacts from the U.S. variable annuity reinsurance transactions.

MFC's financial leverage ratio as at December 31, 2022 was 27.7%, an increase of 1.9 percentage points from 25.8% as at December 31, 2021. The increase in the ratio was driven by a reduction in the carrying value of AFS debt securities from higher interest rates, common share buybacks, and the net issuance of securities[1], partially offset by growth in retained earnings and the impact of a weaker Canadian dollar.

Consolidated capital was $62.5 billion as at December 31, 2022 compared with $66.0 billion as at December 31, 2021, a decrease of $3.5 billion. The decrease was driven by a decline in total equity and the redemption of capital instruments. The decline in total equity was due to a reduction in the carrying value of AFS debt securities from higher interest rates, and common share buybacks, partially offset by growth in retained earnings, the impact of a weaker Canadian dollar, and net capital issuances[2].

Remittances[3] were $6.9 billion in 2022 of which Asia and U.S. operations[4,5] have delivered $0.9 billion and $2.8 billion respectively. Remittances in 2022 increased by $2.5 billion compared with 2021 primarily due to contributions related to the U.S. variable annuity transactions and other corporate actions.

Cash and cash equivalents and marketable assets[6] was $241.0 billion as at December 31, 2022 compared with $268.4 billion as at December 31, 2021. The decrease of $27.4 billion was primarily driven by the lower market value of fixed income instruments due to higher interest rates and the lower market value of public equities due to a decline in equity markets. Refer to "Liquidity Risk Management Strategy" below for more information.

Book value per common share as at December 31, 2022 was $26.49, in line with $26.78 as at December 31, 2021, and the book value per common share excluding accumulated other comprehensive income ("AOCI") was $26.50 as at December 31, 2022, an increase of 10% compared with $24.12 as at December 31, 2021. Compared with December 31, 2021, book value per common share was impacted by

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[1] For financial leverage ratio, net issuance of securities consisted of the issuance of Limited Recourse Capital Notes (reported as other equity instruments) of $1.0 billion and senior debt of $1.0 billion, offset by the redemption of subordinated debt of $1.0 billion, and two series of preferred shares totaling $0.7 billion.

[2] For consolidated capital, net capital issuance consisted of the issuance of Limited Recourse Capital Notes (reported as other equity instruments) of $1.0 billion, partially offset by the redemption of two series of preferred shares totaling $0.7 billion.

[3] For more information on this metric, see "Non-GAAP and Other Financial Measures" below.

[4] Remittances from Asia and U.S. operations include the remittances from their respective affiliate reinsurers. In addition, U.S. operation remittances include the International High Net Worth business written in the Bermuda branch of MLI.

[5] Asia and U.S. operations include their respective insurance, and wealth and asset management segments.

[6] Includes 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.

a reduction in the carrying value of AFS debt securities from higher interest rates offset by an increase in retained earnings, the favourable impact of a weaker Canadian dollar and common share buybacks. The number of common shares outstanding was 1,865 million as at December 31, 2022 and 1,943 million as at December 31, 2021.

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 $45.1 billion of net realized and unrealized investment losses in investment income in 2022 (2021 – losses of $4.0 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 “Non-GAAP and Other Financial Measures” below.

Public Equity Risk and Interest Rate Risk

At December 31, 2022, 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 $560 million and the impact of a 50 basis point decline in interest rates, across all durations and markets, on our earnings was estimated to be a charge of $100 million. See “Risk Management and Risk Factors” below.

Impact of Foreign Exchange Rates

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

Items impacting our Consolidated Statements of Income are translated to Canadian dollars using average exchange rates for the respective quarterly period. For items impacting our Consolidated Statements of Financial Position, period end rates are used for currency translation purposes. The following table provides the most relevant foreign exchange rates for 2022 and 2021.

	Quarterly					**Full Year**	
Exchange rate	**4Q22**	3Q22	2Q22	1Q22	4Q21	**2022**	2021
Average[1]							
U.S. dollar	**1.3575**	1.3057	1.2765	1.2663	1.2601	**1.3015**	1.2536
Japanese yen	**0.0096**	0.0094	0.0098	0.0109	0.0111	**0.0099**	0.0114
Hong Kong dollar	**0.1736**	0.1664	0.1627	0.1622	0.1618	**0.1662**	0.1613
Period end							
U.S. dollar	**1.3549**	1.3740	1.2900	1.2496	1.2678	**1.3549**	1.2678
Japanese yen	**0.0103**	0.0095	0.0095	0.0103	0.0110	**0.0103**	0.0110
Hong Kong dollar	**0.1736**	0.1750	0.1644	0.1595	0.1626	**0.1736**	0.1626

[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 currency exchange rates from 2021 to 2022, primarily due to the weakening of the Canadian dollar compared with the U.S. dollar, increased core earnings by approximately $57 million in 2022. The impact of foreign currency exchange rates on items excluded from core earnings does not provide relevant information given the nature of these items.

Strategic priorities progress update

Strategy

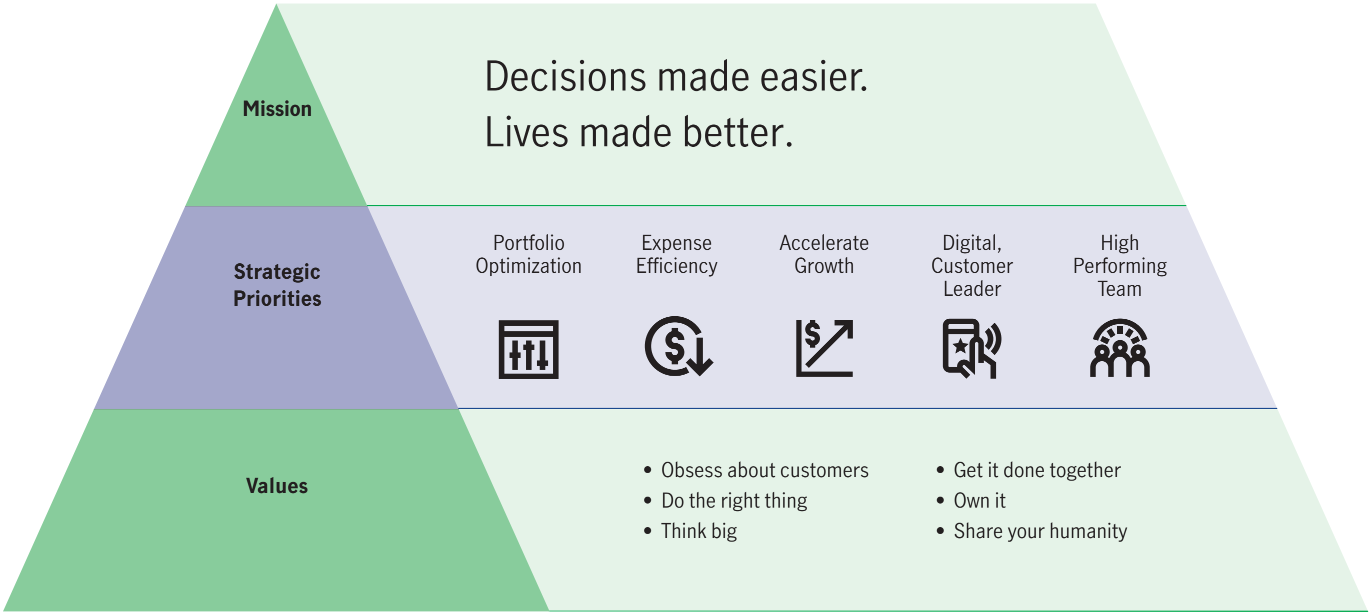
Our ambition is to be the most digital, customer-centric global company in our industry. The goals for our stakeholders are:

Customers
Improve Net Promoter Score ("NPS") by +36 points and delight customers[1]

Employees
Engage our employees — maintain top quartile engagement[2]

Shareholders
Deliver top quartile returns[3]

Our mission, strategic priorities and values are summarized below:



Our values enable the achievement of our mission and strategic priorities, 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.

Strategic Priorities

Our strategy is underpinned by five strategic priorities, and we have made substantial progress on the ambitious targets that we set for ourselves. Our 2022 targets were announced at our 2018 Investor Day and 2025 targets were announced at our 2021 Investor Day.

Accelerate Growth
We remain committed to generating 75% of core earnings from our highest potential businesses[4] by 2025, and 50% of core earnings from our Asia region (Asia segment and Asia wealth and asset management ("Asia WAM")) by 2025.
Focus areas: • Execute on organic and inorganic growth opportunities in Asia and Global WAM • Leverage global footprint and business diversity to allocate capital and resources to higher growth opportunities • Expand North American behavioural insurance offerings to provide innovative solutions and support positive health for customers • Drive new business growth and persistency in group insurance in Canada

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[1] As compared to a baseline of +1 in 2017, by 2025. 2022 results are discussed in the "Strategic Priorities" section below.

[2] Top quartile employee engagement compared to global financial services companies and insurance peers. 2022 results are discussed in the "Strategic Priorities" section below.

[3] MFC's Total Shareholder Return was 27th percentile compared with our performance peer group for the five-year period ended December 31, 2022. Please refer to Manulife's most recent Management Information Circular for more information on our performance peer group.

[4] Highest potential businesses include Asia, Global WAM, Canada group benefits, and behavioural insurance products.

	2022	2021	Baseline 2017	Targets[1] 2022	 2025
Core earnings from highest potential businesses	**63%**	63%	54%	67%	75%
Core earnings from Asia region	**39%**	39%	n/a	n/a	50%

In 2022, 63% of core earnings were generated from our highest potential businesses, a notable improvement of 9 percentage points from the 2017 baseline of 54%. This increase was supported by a strong execution track record against our strategic priorities, coupled with robust inorganic growth opportunities in Asia and Global WAM markets. Our position as the third largest Pan-Asian life insurer, a scalable Global WAM platform that enables an integrated operating model and distribution capabilities, and greater demand for our North American behavioural insurance products reinforced this growth. Looking forward, we will continue to drive momentum through our growing agency force, successful bancassurance partnerships, transformational digital offerings, and strategic expansion into high-potential markets in Asia.

Temporary headwinds faced in Asia due to COVID-19 containment measures and in Global WAM due to challenging market conditions, dampened the contribution of core earnings generated from our highest potential business in 2022, which was 4 percentage points short of our 2022 target.

Our percentage of core earnings from highest potential businesses was 63% in 2022 and in 2021, as the decline in core earnings from highest potential businesses was in line with the decline in total core earnings. Asia core earnings in 2022 decreased 2% compared with 2021, after adjusting for the impact of changes in foreign currency exchange rates, primarily due to the impact of lower new business volumes, partially offset by favourable product mix and in-force business growth. Global WAM core earnings decreased $165 million or 14% on a constant exchange rate basis reflecting a decline in net fee income from lower average AUMA due to higher interest rates and equity market declines in 2022, and lower fee spread. Canada group insurance core earnings in 2022 benefited from in-force business growth.

Confidence in the strength of our diverse, global franchise, balance sheet and financial flexibility position us well to capitalize on attractive opportunities for our highest potential businesses.

2022 Highlights

- Commenced offering insurance solutions to VietinBank's customers in early 2022, as part of our 16-year exclusive bancassurance partnership in Vietnam, demonstrating strong momentum in its first year;
- Further bolstered our presence in high-growth attractive markets by acquiring control of MTEDA through the purchase of the remaining 51% of shares from our joint venture partner, making us the first global wealth and asset manager to acquire a 100% stake in a fully operating public fund management company in mainland China;
- Continued to expand our Private Markets capabilities with the acquisition of a significant minority equity position in ARCH Capital, an Asia-focused real estate private equity investment manager;
- Accelerated the utilization of ManuAcademy, our regional digital learning platform, which was initially launched in Vietnam during 2Q22 and continued to expand to the Philippines in 4Q22. The platform is accessible now to all agents in these two markets, making learning easier while accelerating the further expansion and digitization of Manulife's agency force. Our new training series, Manulife MasterClass, captures best practices from our Million Dollar Round Table agents and shares them across all agents through the platform;
- Expanded our Global WAM Retail product lineup with the launch of the Manulife Real Asset Investment strategy that will give Canadian retail high-net-worth investors access to a combination of private and public real asset investments. Additionally, we launched our first actively managed equity ETF, the U.S. High Dividend ETF, managed by MIM;
- Continued the expansion of the Manulife *Vitality* program, demonstrating our commitment to helping our customers lead healthier lives. All eligible new retail term and universal life insurance policies will include Vitality Go at no cost, while additional features are available with Vitality Plus for a low monthly fee;
- Achieved highest ever full year domestic life insurance sales with the John Hancock Vitality PLUS feature, reflecting the increasing attractiveness of the Vitality feature as an option for health-focused life insurance consumers; and
- Continued to innovate our wellness offerings and entered into a partnership with GRAIL, a healthcare company, offering access to Galleri®, their leading edge, multi-cancer early detection test to a pilot group of customers through John Hancock Vitality. As the first life insurance carrier to make GRAIL's Galleri® test available, we are enabling eligible customers to take proactive steps to better understand and make more informed choices about their health.

Digital, Customer Leader

We remain committed to a target NPS of +37[2] and aim to achieve 88% straight-through-processing ("STP")[3] by 2025.

Focus areas:

- Harness customer feedback to enhance the experience delivered
- Build differentiated, market-leading priority customer experiences
- Extend customer relationships through value-added advice, new services in health and wellness, and open innovation
- Drive NPS through a globally consistent NPS system

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

[2] Represents an improvement of +36 points in our NPS score from the 2017 baseline.

[3] Straight-through processing represents customer interactions that are completely digital, and includes money movement.

	2022	2021	Baseline 2018	Baseline 2017	Targets[1] 2022	Targets[1] 2025
Net promoter score	**+20**	+21	n/a	+1	+31	+37
Straight-through-processing	**83%**	82%	68%	n/a	n/a	88%

In 2022, our NPS score was +20, and we led or were on par with leading peers[2] in 11 of the 16 business lines where we benchmark. The score marked a significant 19 point improvement from our 2017 baseline, driven by various efforts. We have developed forward-looking roadmaps to align and propel our digital customer leadership ambition, refreshed our innovation strategy to embed new ways of working across our businesses, and are advancing our internal capabilities to gather and analyze customer data and sentiment. We have also globally deployed human-centered design practices to systematically research, design, iterate, and deliver best-in-class experiences that are validated with customers at each step.

Our NPS score in 2022 was 1 point below our NPS score in 2021, and short of our ambitious 2022 target of +31, in part because service levels in the first half of 2022 were impacted by workforce capacity constraints, which affected the rolling four quarter average NPS for 2022. We addressed these issues and improved service levels in the second half of the year, although still below our 2022 target; initiatives are underway to maintain momentum for future improvement.

We are making consistent progress on our global STP objectives, with a 15 percentage point improvement from the 2018 baseline across segments in a variety of areas such as system enhancements, app releases and increased digital capabilities.

Customer centricity is at the heart of our ambition and we remain committed to achieving our 2025 NPS and STP targets of +37 and 88%, respectively.

2022 Highlights

- In Asia:
  - Delivered multi-channel options for customers through the launch of Manulife Shop in the Philippines in 4Q22, enabling customers to find and purchase insurance online at their own convenience. We also became the first life insurer in Vietnam to offer health solutions to MoMo's 31 million user base via MoMo e-wallet in 2Q22; and
  - Successfully increased the adoption of ePOS, our proprietary digital onboarding app, by 15 percentage points[3] to 89%, enabling faster, error-free new business application submissions.
- In Global WAM:
  - Enhanced our digital experience in Canada Retirement with the launch of new features that enable members to make additional contributions to their Registered Retirement Savings Plans and to book one-on-one meetings with Manulife PlanRight financial advisors directly in the mobile app. This generated successful engagement, resulting in over 1,780 advisor meeting requests and a 14% increase in member adoption of the mobile app since the launch; and
  - Launched a new, end-to-end digital and mobile-friendly enrollment experience in Canada Retirement for our members. The improved enrollment experience offers a more intuitive and guided experience for our members, helping them feel more confident about their long-term investment choices. 82% of our eligible sponsors adopted the new experience for their employees in 2022.
- In Canada:
  - Launched an upgraded Manulife *Vitality* mobile app experience for our individual insurance business, giving the app a new look and feel with easier navigation to further drive customer engagement; and
  - For our Group Benefits customers, our Manulife Mobile app added a new user interface and navigation refresh, full integration with Manulife ID, and new drug coverage look up functionality.
- In the U.S.:
  - Reduced the average time to complete background checks for new producers within our digital brokerage and traditional brokerage channels by over 90% via automation; and
  - Reduced call volumes for enquiries related to John Hancock Vitality customer login and registration by 39% compared with 2021 by optimizing self-service functionality.

Expense Efficiency

We remain focused on driving efficient growth and are committed to consistently achieving an expense efficiency ratio of less than 50% while ensuring scalable growth, outstanding customer experience, and digital ways of working.

Focus areas:

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

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

[2] Based on studies conducted in 2022 by IPSOS, a global market research company.

[3] Case adoption, compared with 2021.

	2022	2021	Baseline 2017	Target[1] 2022 and onwards
Expense efficiency ratio	**50.9%**	48.9%	55.4%	<50%

We previously delivered on our 2022 target of $1 billion in expense efficiencies in 2020, two years ahead of schedule, and delivered an expense efficiency ratio of 48.9% in 2021. Progress on our expense efficiency ratio compared with the 2017 baseline, reflects a cultural shift throughout the organization that rightsized our expense base by eliminating significant costs and allowing us to be more nimble.

The expense efficiency ratio was 50.9% for 2022, compared with 48.9% in 2021. The 2.0 percentage point increase in the ratio compared with 2021 was driven by an 8% decrease in pre-tax core earnings. Core general expenses were in line with 2021 driven by higher workforce costs offset by the net favourable impact of our strategic focus on digitization and efficiency, lower distribution-related and discretionary expenses reflecting lower 2022 sales, and lower pension costs primarily due to market impacts.

Expense efficiency continues to be an important lever in our current operating environment, and we remain committed to consistently achieving a ratio of less than 50%.

2022 Highlights

- Continued to improve expense efficiency by lowering unit costs and improving scalability of our operations through:
  - Digitizing to improve automation and straight-through processing;
  - Simplifying and standardizing processes;
  - Optimizing organizational structure;
  - Actively managing third-party spend and procurement; and
  - Rationalizing real estate expenditures.
- Achieved annual savings of $200 million (pre-tax) in 2022 resulting from the restructuring action in the first half of 2021.

Portfolio Optimization

We will continue to optimize our legacy businesses and reduce the combined contributions from long-term care insurance (“LTC”) and variable annuities (“VA”) businesses to less than 15% of core earnings by 2025.

Focus areas:

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

			Targets[1]	
	2022	2021[2]	2022	2025
Free up capital from legacy portfolio, cumulative (C$ billions)	**$ 9.0**	$ 6.3	$5.0	n/a
Core earnings contribution from LTC and VA	**18%**	20%	n/a	<15%

We previously achieved our 2022 target to release $5.0 billion of capital in 2019, three years ahead of schedule when we reduced the size of our legacy businesses, freed up capital, and improved core ROE through actions such as reinsurance transactions in North America, buy-back programs on guaranteed minimum withdrawal benefit (“GMWB”) blocks, repricing life insurance blocks, and reinsurance renegotiations and recaptures. Optimization activities continued into 2022; to date, we have delivered $9.0 billion of cumulative capital benefits, exceeding our target by $4.0 billion, reducing our go-forward risk profile and unlocking value from legacy businesses. In 2022, we completed two transactions to reinsure over 80%[3] of our legacy U.S. variable annuity block, releasing $2.5 billion of capital and significantly reducing our risk.

In 2022, we made progress towards our 2025 target and reduced core earnings contribution from LTC and VA by 2 percentage points as compared with December 31, 2021, primarily driven by the impact of the two reinsurance transactions mentioned above. We continue to assess inorganic options such as the two transactions completed in 2022 mentioned above, taking into account policyholder considerations and the potential impact to our risk profile and ROE. We are also confident in our ability to effectively manage the two blocks of business to maturity, most importantly by seeking premium increases for LTC for which we have a strong track record of success.[1]

A dedicated team working exclusively on portfolio optimization, and our proactive, disciplined approach to optimizing the in-force business are key success factors; we remain committed to achieving our 2025 target.

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

[2] 2021 total company and U.S. LTC core earnings were normalized to remove estimated gains on U.S. LTC policyholder experience due to COVID-19.

[3] Represents a reduction in guarantee value on our total U.S. variable annuity block compared with December 31, 2021. Guarantee value on our U.S. variable annuity Guaranteed Minimum Withdrawal Benefits block reduced by more than 90% compared with December 31, 2021.

2022 Highlights

- The two reinsurance transactions of our legacy U.S. variable annuity block resulted in the release of $2.5 billion of capital, which included a cumulative one-time after-tax net gain of $806 million[1]; and
- Other portfolio optimization initiatives released $234 million of capital in 2022.

High Performing Team

We are committed to enabling a high performing team and maintaining top quartile employee engagement compared to global financial services and insurance peers.

Focus areas:

- Organizational effectiveness and speed of decision making
- Diversity, equity, and inclusion
- Developing our talent with differentiated capabilities
- Continuing to strengthen our value proposition to attract and retain top talent

			Baseline	Target[2]
	2022	2021	2017[3]	2022 and onwards
Employee Engagement	**1st quartile**	1st quartile	2nd quartile	1st quartile

We achieved a top quartile employee engagement rank[4] in each of 2020, 2021 and 2022. Our employee engagement score has improved steadily since 2017 and we ranked in the top 6%[4] amongst global finance and insurance companies in 2022. We were also recognized as one of the World's Best Employers by Forbes for the third consecutive year.

Our high performing team has been a key enabler of accomplishments to date, and we remain committed to achieving top quartile employee engagement going forward.

2022 Highlights

- Achieved our fourth consecutive year of higher employee engagement;
- Named to Bloomberg's 2022 Gender-Equality Index for the fourth consecutive year, highlighting our commitment to support gender equality through policy development, representation, and transparency; and
- Recognized as one of Canada's Top 100 Employers 2022 by Mediacorp Canada Inc. for the second year in a row.

Medium-term financial and operating targets[2]

As communicated in May 2022, upon transition to IFRS 17 in 2023, two of our existing targets will increase due to the change in accounting framework, the other existing targets will remain the same, and we will introduce two new targets related to Contractual Service Margin ("CSM").

Our medium-term targets under IFRS 17 are:

- Core EPS growth of 10% to 12% (no change);
- Core ROE target will increase to 15%+ (from 13%+);
- Leverage ratio of 25% (no change);
- Common share core dividend payout ratio[5] range will increase to 35% to 45% (from 30% to 40%);
- CSM balance growth of 8% to 10% per year (new); and
- New business CSM growth of 15% per year (new).

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[1] The cumulative one-time after-tax gain of these two transactions was $806 million, consisting of a net gain of $846 million in 2022 and a $40 million loss recognized in 2021.

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

[3] Starting in 2019, engagement surveys were transitioned to the Gallup methodology.

[4] Based on the annual global employee engagement survey conducted by Gallup. Ranking is measured by the engagement grand mean as compared to Gallup's Finance and Insurance Company level database.

[5] This item is a non-GAAP ratio. See "Non-GAAP and other financial measures" below for more information.

2. Asia

Our Asia segment is a leading provider of insurance products and insurance-based wealth accumulation products, driven by a customer-centric strategy, 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 markets: Hong Kong, Macau, Japan, mainland China, Singapore, Vietnam, Indonesia, the Philippines, Malaysia, Cambodia, and Myanmar.

We have a diversified multi-channel distribution network, including over 116,000 contracted agents and over 100 bank partnerships. We also work with many independent agents, financial advisors, and brokers. Among our bancassurance partnerships we have 10 exclusive partnerships, including a long-term partnership with DBS Bank across Singapore, Hong Kong, mainland China and Indonesia, and VietinBank in Vietnam, that give us access to over 35 million bank customers.

In 2022, our Asia segment contributed 33%[1] of the Company's core earnings from operating segments and, as at December 31, 2022, accounted for 11%[1] of the Company's assets under management and administration.

Profitability

Asia reported net income attributed to shareholders of $2,224 million in 2022 compared with $3,057 million in 2021. Net income attributed to shareholders is comprised of core earnings, which were $2,132 million in 2022 compared with $2,176 million in 2021, and items excluded from core earnings, which amounted to a net gain of $92 million for 2022 compared with a net gain of $881 million in 2021. The changes in net income attributed to shareholders and core earnings expressed in Canadian dollars were due to the factors described below and, in addition, the change in core earnings reflected a net $28 million unfavourable impact due to changes in foreign currency exchange rates versus the Canadian dollar.

Expressed in U.S. dollars, the presentation currency of the segment, net income attributed to shareholders was US$1,711 million in 2022 compared with US$2,437 million in 2021 and core earnings were US$1,637 million in 2022 compared with US$1,736 million in 2021. Items excluded from core earnings are outlined in the table below and amounted to a net gain of US$74 million in 2022 compared with a net gain of US$701 million in 2021.

Core earnings in 2022 decreased 2% compared with 2021, after adjusting for the impact of changes in foreign currency exchange rates. The changes in core earnings by geography are as follows:

- Hong Kong decreased 8% reflecting lower new business volumes and less favourable policyholder experience, partially offset by favourable product mix;
- Mainland China decreased 83% reflecting the broader economic challenges from COVID-19 containment measures, changes in product mix from the ongoing regulatory changes to critical illness products, and unfavourable policyholder experience;
- Other Emerging Markets decreased 6% reflecting lower new business volumes, partially offset by favourable product mix;
- Japan increased 24% due to favourable product mix, in-force business growth and improved policyholder experience, partially offset by the impact of lower new business volumes;
- Vietnam increased 9% benefiting from in-force business growth and favourable product mix, partially offset by lower new business volumes; and
- Singapore increased 1% reflecting in-force business growth and improved policyholder experience, partially offset by lower new business gains.

In addition, higher investment income on allocated capital increased core earnings by US$49 million compared with 2021 (see Corporate and Other Segment).

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[1] This item is a non-GAAP ratio. See "Non-GAAP and Other Financial Measures" below for more information.

The table below presents net income attributed to shareholders for Asia for 2022 and 2021 consisting of core earnings and items excluded from core earnings.

For the years ended December 31, ($ millions)	Canadian $		US $	
	2022	2021	**2022**	2021
Core earnings	**$ 2,132**	$ 2,176	**$ 1,637**	$ 1,736
Items excluded from core earnings:[1]				
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	**31**	313	**30**	251
Direct impact of equity markets and interest rates and variable annuity guarantee liabilities[2]	**153**	169	**114**	133
Change in actuarial methods and assumptions	**(45)**	343	**(34)**	273
Reinsurance transactions, tax-related items and other	**(47)**	56	**(36)**	44
Total items excluded from core earnings	**92**	881	**74**	701
Net income attributed to shareholders	**$ 2,224**	$ 3,057	**$ 1,711**	$ 2,437

(1) For explanations of items excluded from core earnings, see "Items excluded from core earnings" table in the total Company "Profitability" section above.

(2) The direct impact of markets in 2022 was a gain of US$114 million and included a gain of US$501 million related to fixed income reinvestment rates and a charge of US$387 million related to equity markets and variable annuity guarantee liabilities. The direct impact of markets in 2021 was a gain of US$133 million and included a gain of US$98 million related to fixed income reinvestment rates and a gain of US$35 million related to equity markets and variable annuity guarantee liabilities.

Business Performance

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

APE sales in 2022 were US$2,748 million, representing a decrease of 12% compared with 2021. APE sales decreased in Hong Kong, Japan, Vietnam and Other Emerging Markets, and increased in mainland China and Singapore. COVID-19 continued to impact sales in select markets throughout the year, with the situation beginning to improve in most markets as containment measures have been progressively relaxed. Travel restrictions between mainland China and, Hong Kong and Macau impacted cross-border commerce in 2022. Weaker customer sentiment began to negatively affect sales in the second half of the year.

In Hong Kong, APE sales in 2022 were US$573 million, a 33% decrease compared with 2021, primarily reflecting weaker customer sentiment on financial planning decisions and continued COVID-19 containment measures through most of the year. Japan APE sales in 2022 were US$307 million, a decrease of 15% compared with 2021, reflecting lower COLI product sales, partially offset by higher individual protection and other wealth sales. Vietnam APE sales in 2022 were US$337 million, a 9% decrease compared with 2021, reflecting a decline in the agency channel, partially offset by growth in the bank channel. Other Emerging Markets APE sales in 2022 were US$281 million, a 4% decrease compared with 2021, reflecting a decline in agency and bank channels. Mainland China APE sales in 2022 were US$484 million, a 4% increase compared with 2021, reflecting growth in the bank channel, partially offset by a decline in the agency channel. Singapore APE sales in 2022 were US$766 million, a 1% increase compared with 2021, reflecting growth in the bank channel, offset by a decline in the broker channel.

New business value ("NBV") was US$1,037 million in 2022, a decrease of 20% compared with 2021. NBV was lower in Hong Kong, Singapore, and mainland China, partially offset by higher NBV in Japan and Other Emerging Markets. In Hong Kong, NBV in 2022 was US$447 million, a 27% decrease compared with 2021, reflecting lower sales volumes, partially offset by favourable product mix and the impact of higher interest rates. NBV in 2022 was US$206 million in Singapore and US$50 million in mainland China, a decrease of 19% and 58%, respectively, compared with 2021, reflecting changes in product mix. In Vietnam, NBV in 2022 was US$177 million, in line with 2021, as the impact of favourable product mix was offset by lower sales volumes. NBV in 2022 was US$101 million in Japan and US$56 million in Other Emerging Markets, an increase of 28% and 5%, respectively, compared with 2021, reflecting favourable product mix, partially offset by lower sales volumes. The new business value margin ("NBV margin")[1] was 41.8% in 2022, a decrease of 3.1 percentage points compared with 2021.

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[1] For more information on this metric, see "Non-GAAP and Other Financial Measures" below.

APE Sales and NBV

For the years ended December 31, ($ millions)	Canadian $ **2022**	 2021	US $ **2022**	 2021
Annualized premium equivalent sales	**$ 3,569**	$ 4,050	**$ 2,748**	$ 3,229
New business value	**$ 1,349**	$ 1,666	**$ 1,037**	$ 1,329

Assets under Management[1]

Asia's assets under management were US$110.3 billion as at December 31, 2022, a decrease of US$11.7 billion or 6% compared with December 31, 2021. The decrease was driven by the impact of higher interest rates and unfavourable equity market performance on invested assets and segregated funds net assets, partially offset by net customer inflows of US$9.9 billion.

Assets under Management

As at December 31, ($ millions)	Canadian $ **2022**	 2021	US $ **2022**	 2021
Total invested assets	**$ 126,267**	$ 129,207	**$ 93,179**	$ 101,893
Segregated funds net assets	**23,226**	25,505	**17,138**	20,112
Total assets under management	**$ 149,493**	$ 154,712	**$ 110,317**	$ 122,005

Revenue

Total revenue of US$11.4 billion in 2022 decreased US$12.2 billion compared with 2021. Revenue before net realized and unrealized investment gains and losses decreased US$1.4 billion compared with 2021 due to a decrease in net premium income and changes in foreign currency exchange rates. The net premium income decrease was primarily driven by lower new business sales, partially offset by the growth of in-force business.

Revenue

For the years ended December 31, ($ millions)	Canadian $ **2022**	 2021	US $ **2022**	 2021
Gross premiums	**$ 22,337**	$ 24,013	**$ 17,204**	$ 19,152
Premiums ceded to reinsurers	**(861)**	(1,027)	**(664)**	(819)
Net premium income	**21,476**	22,986	**16,540**	18,333
Investment income	**4,190**	3,207	**3,228**	2,557
Other revenue	**1,458**	1,696	**1,115**	1,353
Revenue before net realized and unrealized investment gains and losses	**27,124**	27,889	**20,883**	22,243
Net realized and unrealized investment gains and losses(1)	**(12,162)**	1,682	**(9,478)**	1,391
Total revenue	**$ 14,962**	$ 29,571	**$ 11,405**	$ 23,634

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

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[1] This item is a non-GAAP financial measure. See "Non-GAAP and Other Financial 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. Our growth is underpinned by powerful economic secular trends including middle-class emergence, low insurance penetration and an estimated mortality protection gap of more than US$100 trillion by 2030[1] driving continued demand for financial solutions.

We continued to invest in our diversified distribution platform to accelerate growth. In 2022 we:

- Commenced offering insurance solutions to VietinBank's customers in early 2022, as part of our 16-year exclusive bancassurance partnership in Vietnam, demonstrating strong momentum in its first year; and
- Accelerated the utilization of ManuAcademy, our regional digital learning platform, which was initially launched in Vietnam during 2Q22 and continued to expand to the Philippines in 4Q22. The platform is accessible now to all agents in these two markets, making learning easier while accelerating the further expansion and digitization of Manulife's agency force. Our new training series, Manulife MasterClass, captures best practices from our Million Dollar Round Table agents and shares them across all agents through the platform.

In 2022, we continued to increase NPS, as we further enhanced digital capabilities and invested in high impact digital initiatives spanning the full customer and distributor experience from Search, Buy, Manage & Review to Claim.

- Search: Delivered multi-channel options for customers through the launch of Manulife Shop in the Philippines in 4Q22, enabling customers to find and purchase insurance online at their own convenience. We also became the first life insurer in Vietnam to offer health solutions to MoMo's 31 million user base via MoMo e-wallet in 2Q22;
- Buy: Successfully increased the adoption of ePOS, our proprietary digital onboarding app, by 15 percentage points[2] to 89%, enabling faster, error-free new business application submissions;
- Manage & Review: Enhanced self-servicing capabilities on our proprietary health and wellness platform, ManulifeMOVE, with initial rollout in Vietnam, accelerating MOVE as the one-stop digital gateway for health and life servicing; and
- Claim: Further increased utilization of our digital claims platform, with 76% of claims being submitted digitally, an increase of 12 percentage points compared with 2021 driven by strong improvements in Japan and continued high customer adoption across Asia.

We continued to maintain a winning culture and make Manulife a great place to work. Manulife has been recognized by HR Asia as one of the "Best Companies to Work for in Asia 2022" in five of our Asian markets — mainland China, Hong Kong, Malaysia, Singapore and Vietnam.

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[1] Closing Asia's mortality protection gap, Swiss Re, July 2020.

[2] Case adoption, compared with 2021.

3. Canada

Our Canada segment is a leading financial services provider, offering insurance products, insurance-based wealth accumulation products and banking solutions, has an in-force variable annuity business, and leverages 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 26,000 Canadian businesses and organizations entrusting their employee benefit programs to Manulife's Group Insurance. We also provide life, health, disability 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, guaranteed investment certificates, lines of credit, investment loans, mortgages and other specialized lending programs, offered through financial advisors and mortgage brokers supported by a broad distribution network.

In 2022, our Canada segment contributed 21% of the Company's core earnings from operating segments and, as at December 31, 2022, accounted for 11% of the Company's assets under management and administration.

Profitability

Canada's full year 2022 net income attributed to shareholders was $1,530 million compared with $1,354 million in 2021. Net income attributed to shareholders is comprised of core earnings, which was $1,359 million in 2022 compared with $1,179 million in 2021, and items excluded from core earnings, which amounted to a net gain of $171 million for 2022 compared with a net gain of $175 million in 2021. Items excluded from core earnings are outlined in the table below.

The $180 million increase in core earnings was driven by experience gains in 2022 compared with losses in 2021, with all businesses contributing to the improvement, higher insurance in-force earnings, and higher bank earnings, partially offset by the impact of an increase in the tax rate and lower segregated fund in-force earnings due to lower equity markets.

The table below presents net income attributed to shareholders for Canada for 2022 and 2021 consisting of core earnings and items excluded from core earnings.

For the years ended December 31, ($ millions)	**2022**	2021
Core earnings	**$ 1,359**	$ 1,179
Items excluded from core earnings:[1]		
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	**70**	329
Direct impact of equity markets and interest rates and variable annuity guarantee liabilities[2]	**76**	(89)
Change in actuarial methods and assumptions	**35**	(65)
Reinsurance transactions, tax-related items and other	**(10)**	–
Total items excluded from core earnings	**171**	175
Net income attributed to shareholders	**$ 1,530**	$ 1,354

[1] For explanations of items excluded from core earnings, see "Items excluded from core earnings" table in the total Company "Profitability" section above.

[2] The direct impact of markets in 2022 was a gain of $76 million and included a gain of $192 million related to fixed income reinvestment rates, partially offset by a charge of $116 million related to the direct impact of equity markets and variable annuity guarantee liabilities. The charge in 2021 related to fixed income reinvestment rates and changes to the URR, partially offset by a gain related to the direct impact of equity markets and variable annuity guarantee liabilities.

Business Performance

APE sales were $1,261 million in 2022, an increase of 3% compared with 2021. Individual insurance APE sales in 2022 of $415 million decreased 2% compared with 2021, primarily driven by lower universal life and health and dental sales, partially offset by higher participating insurance and travel insurance sales. Group insurance APE sales of $576 million in 2022 increased 30% compared with 2021, reflecting higher sales in all markets. Annuities APE sales in 2022 of $270 million decreased 25% compared with 2021, due to the impact of market volatility on the demand for segregated fund products.

Sales

For the years ended December 31,
($ millions)

	2022	2021
APE sales	**$ 1,261**	$ 1,227

Manulife Bank average net lending assets[1] were $24.1 billion in 2022, up $1.0 billion or 4% compared with 2021, driven by strong retention efforts and new loan volumes.

Assets under Management

Assets under management of $146.1 billion as at December 31, 2022 decreased $15.9 billion or 10% from $162.0 billion as at December 31, 2021, due to lower total invested assets and segregated funds net assets, primarily reflecting the impact of higher interest rates and a decline in equity markets.

Assets under Management

As at December 31,
($ millions)

	2022	2021
Total invested assets	**$ 110,433**	$ 119,872
Segregated funds net assets	**35,695**	42,124
Total assets under management	**$ 146,128**	$ 161,996

Revenue

Total revenue of $3.9 billion in 2022 decreased $8.5 billion from $12.4 billion in 2021, primarily driven by higher net realized and unrealized investment losses in 2022 compared to 2021. Revenue before net realized and unrealized investment gains and losses of $16.4 billion in 2022 increased $1.0 billion from $15.4 billion in 2021, primarily due to business growth.

Revenue

For the years ended December 31,
($ millions)

	2022	2021
Gross premiums	**$ 12,202**	$ 11,251
Premiums ceded to reinsurers	**(1,810)**	(1,690)
Net premium income	**10,392**	9,561
Investment income	**4,606**	4,495
Other revenue	**1,426**	1,336
Revenue before net realized and unrealized investment gains and losses	**16,424**	15,392
Net realized and unrealized investment gains and losses(1)	**(12,517)**	(3,026)
Total revenue	**$ 3,907**	$ 12,366

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

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[1] This item is a non-GAAP financial measure. See "Non-GAAP and Other Financial Measures" below for more information.

Strategic Highlights

In 2022, we added innovative customer-centric enhancements across our product shelf to help Canadians focus on improving their health and wellness. We also advanced our digital capabilities across our businesses to stay connected with our clients and strengthen their experience with us.

We continued to offer a differentiated customer experience. In 2022, we:

- Continued the expansion of the Manulife *Vitality* program, demonstrating our commitment to helping our customers lead healthier lives. All eligible new retail term and universal life insurance policies will include Vitality Go at no cost, while additional features are available with Vitality Plus for a low monthly fee;
- Reduced Group Benefits claims processing times by 60%, providing a better customer experience as evidenced by an increase in our net promoter score; and
- Launched a campaign in Group Benefits to help new customers easily access and use our digital tools, better understand their benefits plan, and learn how to submit claims online.

We further advanced digital solutions across our business. In 2022, we:

- Enhanced our apps across many businesses:
  - Launched an upgraded Manulife *Vitality* mobile app experience for our individual insurance business, giving the app a new look and feel with easier navigation to further drive customer engagement;
  - For our Group Benefits customers, our Manulife Mobile app added a new user interface and navigation refresh, full integration with Manulife ID, and new drug coverage lookup functionality;
- Launched a new customer site for Retail Insurance customers and their advisors, giving real time access to coverage information. This site sets the foundation to enable future digital transactions for our customers; and
- Continued to advance our digital solutions with enhancements to Manulife.ca that included enabling artificial intelligence and natural-language processing capabilities to make searching for product information quicker, more accurate and more intuitive.

4. U.S.

Our U.S. segment provides a range of life insurance products and 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 licensed 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 2022, our U.S. segment contributed 27% of the Company's core earnings from operating segments and, as at December 31, 2022, accounted for 17% of the Company's assets under management and administration.

Profitability

U.S. reported net income attributed to shareholders of $3,950 million in 2022 compared with $2,080 million in 2021. Net income attributed to shareholders is comprised of core earnings, which was $1,700 million in 2022 compared with $1,936 million in 2021, and items excluded from core earnings, which amounted to a net gain of $2,250 million in 2022 compared with a net gain of $144 million in 2021. The changes in net income attributed to shareholders and core earnings expressed in Canadian dollars were due to the factors described below and, in addition, the change in core earnings reflected a $58 million favourable impact from the strengthening of the U.S. dollar compared with the Canadian dollar.

Expressed in U.S. dollars, the functional currency of the segment, 2022 net income attributed to shareholders was US$3,077 million compared with US$1,667 million in 2021 and core earnings were US$1,311 million in 2022 compared with US$1,544 million in 2021. Items excluded from core earnings are outlined in the table below and amounted to a net gain of US$1,766 million in 2022 compared with a net gain of US$123 million in 2021.

The US$233 million or 15% decrease in core earnings was driven by lower in-force earnings in Annuities of US$147 million related to the two transactions to reinsure over 80%[1] of our U.S. variable annuity block in 2022, lower new business gains, higher net unfavourable policyholder experience, and the non-recurrence of prior year gains from the Annuity Guaranteed Minimum Withdrawal Benefit offer program. Compared with 2021, less favourable long-term care and annuities policyholder experience was partially offset by improved, although still unfavourable, life insurance policyholder experience. In addition, higher investment income on allocated capital increased core earnings by US$24 million compared with 2021 (see Corporate and Other segment).

The table below presents net income attributed to shareholders for the U.S. for 2022 and 2021 consisting of core earnings and items excluded from core earnings.

For the years ended December 31, ($ millions)	Canadian $		US $	
	2022	2021	**2022**	2021
Core earnings	**$ 1,700**	$ 1,936	**$ 1,311**	$ 1,544
Items excluded from core earnings:(1)				
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	**1,183**	1,341	**930**	1,074
Direct impact of equity markets and interest rates and variable annuity guarantee liabilities(2)	**197**	(727)	**151**	(578)
Change in actuarial methods and assumptions	**36**	(314)	**27**	(249)
Reinsurance transactions, tax-related items and other	**834**	(156)	**658**	(124)
Total items excluded from core earnings	**2,250**	144	**1,766**	123
Net income (loss) attributed to shareholders	**$ 3,950**	$ 2,080	**$ 3,077**	$ 1,667

(1) For explanations of items excluded from core earnings, see "Items excluded from core earnings" table in the total Company "Profitability" section above.

(2) The direct impact of markets in 2022 was a gain of US$151 million and included a gain of US$396 million related to fixed income reinvestment rates, partially offset by a charge of US$245 million related to the direct impact of equity markets and variable annuity guarantee liabilities. The direct impact of markets in 2021 was a charge of US$578 million and included a charge of US$493 million related to fixed income reinvestment rates and a charge of US$85 million related to the direct impact of equity markets and variable annuity guarantee liabilities.

Business Performance

U.S. APE sales in 2022 of US$633 million increased 1% compared with 2021 due to an increase in international sales, partially offset by lower sales of domestic life insurance products. Demand for domestic life insurance products purchased primarily to protect household

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[1] Represents a reduction in guarantee value on our total U.S. variable annuity block compared with December 31, 2021. Guarantee value on our U.S. variable annuity Guaranteed Minimum Withdrawal Benefits block reduced by more than 90% compared with December 31, 2021.

income declined across the industry. Recently, volatility in equity markets has reduced the demand for domestic products that are purchased primarily for estate planning. APE sales of products with the John Hancock Vitality PLUS feature in 2022 were a record-setting US$332 million, an increase of 13% compared with 2021, reflecting the increasing attractiveness of the Vitality feature as an option for health-focused life insurance consumers.

Sales

For the years ended December 31, ($ millions)	Canadian $		US $	
	2022	2021	**2022**	2021
APE sales	**$ 823**	$ 788	**$ 633**	$ 628

Assets under Management

U.S. assets under management of US$162.0 billion as at December 31, 2022 decreased 16% from December 31, 2021. The decrease in total invested assets and segregated funds net assets was primarily due to the impact of an increase in interest rates and a decline in equity markets, and the continued run-off of the annuity business, including the impact on total invested assets from the above-noted variable annuity reinsurance transactions.

Assets under Management

As at December 31, ($ millions)	Canadian $		US $	
	2022	2021	**2022**	2021
Total invested assets	**$ 154,004**	$ 164,830	**$ 113,660**	$ 130,013
Segregated funds net assets	**65,489**	79,620	**48,333**	62,801
Total assets under management	**$ 219,493**	$ 244,450	**$ 161,993**	$ 192,814

Revenue

Total revenue in 2022 was a net loss of US$5.6 billion and decreased US$16.3 billion compared with 2021. Revenue before net realized and unrealized investment gains and losses was US$10.5 billion, a decrease of US$2.2 billion compared with 2021, primarily due to the above-noted variable annuity reinsurance transactions.

Revenue

For the years ended December 31, ($ millions)	Canadian $		US $	
	2022	2021	**2022**	2021
Gross premium income	**$ 9,329**	$ 8,965	**$ 7,168**	$ 7,151
Premiums ceded to reinsurers	**(3,613)**	(2,594)	**(2,791)**	(2,069)
Net premium income	**5,716**	6,371	**4,377**	5,082
Investment income	**7,544**	7,771	**5,792**	6,197
Other revenue	**458**	1,824	**342**	1,456
Revenue before net realized and unrealized investment gains and losses	**13,718**	15,966	**10,511**	12,735
Net realized and unrealized investment gains and losses(1)	**(20,547)**	(2,710)	**(16,074)**	(2,010)
Total revenue	**$ (6,829)**	$ 13,256	**$ (5,563)**	$ 10,725

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

Strategic Highlights

At John Hancock, we are focused on building 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 addition, we continued to make significant progress to optimize our portfolio through both organic initiatives and strategic reinsurance transactions, and create tangible shareholder value through various in-force management actions. In 2022, we:

- Completed two transactions to reinsure over 80%[1] of our legacy U.S. variable annuity block. These transactions resulted in the release of $2.5 billion of capital, which included a cumulative one-time after-tax net gain of $806 million[2];
- Achieved highest ever full year domestic life insurance sales with the John Hancock Vitality PLUS feature, reflecting the increasing attractiveness of the Vitality feature as an option for health-focused life insurance consumers;
- Continued to innovate our wellness offerings and entered into a partnership with GRAIL, a healthcare company, offering access to Galleri®, their leading edge, multi-cancer early detection test to a pilot group of customers through John Hancock Vitality. As the first

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[1] Represents a reduction in guarantee value on our total U.S. variable annuity block compared with December 31, 2021. Guarantee value on our U.S. variable annuity Guaranteed Minimum Withdrawal Benefits block reduced by more than 90% compared with December 31, 2021.

[2] The cumulative one-time after-tax gain of these two reinsurance transactions was $806 million, consisting of a net gain of $846 million in 2022 and a $40 million loss recognized in 2021.

life insurance carrier to make GRAIL's Galleri® test available, we are enabling eligible customers to take proactive steps to better understand and make more informed choices about their health; and
- Reported record APE sales and case placements in our international business. We signed new distributors in the Latin America region and launched a whole life product to support continued sales growth and diversify the business across geographies.

In 2022, we achieved the following digital successes, improving the producer and customer experience while also contributing to a more cost-efficient operation:

- Reduced the average time to complete background checks for new producers within our digital brokerage and traditional brokerage channels by over 90% via automation;
- Accelerated new producers' ability to place cases with John Hancock from two business days to just minutes, by automating the scheduling of appointments into our digital brokerage licensing system;
- Reduced call volumes for enquiries related to John Hancock Vitality customer login and registration by 39% compared with 2021 by optimizing self-service functionality;
- Enabled third-party ownership submission of life insurance applications via JH eApp. This advancement allows even very large cases, which are typically trust-owned, to take advantage of our digital experience; and
- Improved producer experience and customer response times by launching eDelivery notification of client correspondence.

5. Global Wealth and Asset Management

Our Global Wealth and Asset Management segment, branded as Manulife Investment Management, 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 19 geographies[1], including 10 in Asia with over 120 years of on-the-ground experience.

In Retirement, we provide financial guidance, advice, investment solutions and recordkeeping services to over 8 million plan participants and rollover individuals in North America and Asia while they are in the accumulation phase with their employer, and increasingly as they prepare for retirement outside their employer's plan. In North America, our Canadian retirement business focuses on providing retirement solutions through defined contribution 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.

In Retail, we distribute investment funds to clients through our proprietary advice channels in Canada and Asia as well as through intermediaries and banks in North America, Europe, and Asia, and offer investment strategies across the world, through affiliated and select unaffiliated asset managers. In Canada, we also provide holistic personal advice to individual clients and investment management, private banking and wealth and estate solutions to high-net-worth clients. In addition, we provide wealth management expertise for insurance-based wealth accumulation products that are distributed through Manulife's insurance segments, as well as through our own proprietary advice channels.

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, and 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 develop innovative global frameworks for sustainable investing, collaboratively engage with companies in our internally managed portfolios, and maintain a high standard of stewardship where we own and operate assets.

In 2022, our Global WAM segment contributed 19% of the Company's core earnings from operating segments and, as at December 31, 2022, represented 59% of the Company's total assets under management and administration.

Profitability

Global WAM's 2022 net income attributed to shareholders was $1,321 million compared with $1,406 million in 2021, and core earnings were $1,241 million in 2022 compared with $1,406 million in 2021. Items excluded from core earnings are outlined in the table below and amounted to a net gain of $80 million in 2022 compared with nil in 2021.

Core earnings decreased $165 million or 14% on a constant exchange rate basis reflecting a decline in net fee income from lower average AUMA due to higher interest rates and equity market declines in 2022, and lower fee spread. Net income attributed to shareholders decreased $85 million in 2022 compared with 2021 driven by the same factors as mentioned above, partially offset by a net gain of $80 million excluded from core earnings in 2022 as explained below.

The table below presents net income attributed to shareholders for the Global WAM segment for 2022 and 2021 consisting of core earnings and items excluded from core earnings.

For the years ended December 31, ($ millions)	2022	2021
Core earnings		
Retirement	**$ 699**	$ 819
Retail	**523**	551
Institutional	**19**	36
Core earnings	**1,241**	1,406
Items excluded from core earnings:		
Reinsurance transactions, tax-related items and other(1)	**80**	–
Net income attributed to shareholders	**$ 1,321**	$ 1,406

(1) The net gain of $80 million includes a net gain of $86 million related to acquiring full ownership interest of MTEDA by purchasing the remaining 51% of shares from our joint venture partner, partially offset by a $6 million charge related to an increase in the Canadian corporate tax rate.

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

In 2022, core EBITDA[1] for Global WAM was $1,890 million, $649 million higher than core earnings. In 2021, core EBITDA was $2,062 million, $656 million higher than core earnings. The decrease in core EBITDA of $172 million or 10% on a constant exchange rate basis was driven by similar factors as noted above for core earnings. Core EBITDA margin[2] was 30.4% in 2022 compared with 31.5% in 2021. The 110 basis point decrease was driven by a decline in net fee income. Income before income taxes for Global WAM was $1,546 million in 2022, a decrease of $95 million compared with 2021, driven by similar factors as noted above for net income attributed to shareholders.

Core EBITDA

For the years ended December 31, ($ millions)	**2022**	2021
Core earnings	**$ 1,241**	$ 1,406
Amortization of deferred acquisition costs and other depreciation	**336**	323
Amortization of deferred sales commissions	**95**	99
Core income tax expense (recovery)	**218**	234
Core EBITDA	**$ 1,890**	$ 2,062
Core EBITDA margin	**30.4%**	31.5%
Income before income taxes	**$ 1,546**	$ 1,641

Business Performance

Gross Flows and Net Flows

Gross Flows were $136.6 billion in 2022, a decrease of 7% compared with 2021. By business line, the results were:

- Retirement gross flows in 2022 were $52.1 billion, in line with 2021, reflecting growth in member contributions offset by lower new plan sales.
- Retail gross flows in 2022 were $67.7 billion, a decrease of 14% compared with 2021, reflecting lower investor demand amid higher interest rates and equity market declines in 2022.
- Institutional Asset Management gross flows in 2022 were $16.8 billion, an increase of 5% compared with 2021 driven by higher equity mandate gross flows, mainly from a $1.9 billion sale in 2Q22, partially offset by lower fixed income mandate gross flows.

Net Inflows were $3.3 billion in 2022, compared with net inflows of $27.9 billion in 2021. By business line, the results were:

- Retirement net outflows were $0.1 billion in 2022 compared with net inflows of $1.1 billion in 2021, driven by higher plan redemptions in the U.S.
- Retail net outflows were $1.6 billion in 2022 compared with net inflows of $29.2 billion in 2021, driven by higher redemptions and lower gross flows due to factors mentioned above.
- Institutional Asset Management net inflows were $5.0 billion in 2022 compared with net outflows of $2.4 billion in 2021, driven by the non-recurrence of a $9.4 billion redemption in 2021 and higher equity mandate gross flows as mentioned above.

Gross Flows and Net Flows

For the years ended December 31, ($ millions)	**2022**	2021
Gross flows	**$ 136,648**	$ 144,681
Net flows	**$ 3,305**	$ 27,893

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[1] This item is a non-GAAP financial measure. See “Non-GAAP and Other Financial Measures” below.

[2] This item is a non-GAAP ratio. See “Non-GAAP and Other Financial Measures” below for more information.

Assets under Management and Administration

In 2022, AUMA for our wealth and asset management businesses were $779.9 billion, 13% lower compared with December 31, 2021 on a constant exchange rate basis driven by the impact of higher interest rates and equity market declines, partially offset by $8.8 billion in assets acquired and net inflows of $3.3 billion. As of December 31, 2022, Global WAM also managed $229.5 billion in assets for the Company's non-WAM reporting segments. Including those assets, AUMA managed by Global WAM[1] were $1,009.4 billion compared with $1,102.7 billion as at December 31, 2021.

Segregated funds net assets were $224.2 billion for December 31, 2022, 11% lower compared with December 31, 2021 on an actual exchange rate basis, driven by the impact of higher interest rates and equity market declines. Total invested assets in our general fund form a small portion of Global WAM AUMA.

Changes in Assets under Management and Administration

For the years ended December 31,
($ millions)

	2022	2021
Balance January 1,	$ 855,927	$ 753,610
Acquisitions/Dispositions	8,789	1,633
Net flows	3,305	27,893
Impact of markets and other	(88,109)	72,791
Balance December 31,	**$ 779,912**	$ 855,927
Average assets under management and administration	**$ 787,842**	$ 798,022

Assets under Management and Administration

As at December 31,
($ millions)

	2022	2021
Total invested assets	$ 3,717	$ 4,458
Segregated funds net assets(1)	224,192	252,567
Mutual funds, institutional asset management and other(2)	381,779	411,271
Total assets under management	**609,688**	668,296
Other assets under administration	170,224	187,631
Total assets under management and administration	**$ 779,912**	$ 855,927

(1) Segregated funds net assets are comprised of Retirement assets under management ("AUM"), consisting primarily of fee-based products with little or no guarantees.
(2) Other funds represent pension funds, pooled funds, endowment funds and other institutional funds managed by the Company on behalf of others.

Revenue

Total revenue in 2022 of $6.3 billion decreased 6% compared with 2021, driven by lower fee income from lower average AUMA and lower fee spread, and lower investment income. This was partially offset by higher other revenue from a gain on our acquisition of the remaining equity interest in MTEDA.

Revenue

As at December 31,
($ millions)

	2022	2021
Fee income	$ 6,265	$ 6,513
Investment income	(44)	28
Other revenue	90	–
Total revenue	**$ 6,311**	$ 6,541

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

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 being a global retirement leader by supporting financial wellness; expanding our presence in retail distribution platforms across the globe; leveraging a multi-manager model; and providing differentiated institutional 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 2022, we:

- Further bolstered our presence in high-growth attractive markets by acquiring control of MTEDA through the purchase of the remaining 51% of shares from our joint venture partner, making us the first global wealth and asset manager to acquire a 100% stake in a fully operating public fund management company in mainland China;
- Continued to expand our Private Markets capabilities with the acquisition of a significant minority equity position in ARCH Capital, an Asia-focused real estate private equity investment manager;
- Expanded our Environmental, Social and Governance investment offerings with the launch of the Global Climate Action Strategy in Europe and Asia, and the launch of the Manulife Forest Climate strategy in the U.S., which will promote climate change mitigation by investing in sustainably managed forests that prioritize carbon sequestration. Additionally, we published our 2022 Manulife Investment Management Stewardship report, detailing our commitment to sustainability as a global investment manager and outlining actions we are taking to address material sustainability risks and opportunities, build more resilient portfolios, and pursue long-term value creation;
- Expanded our Global Retail product lineup with the launch of the Manulife Real Asset Investment strategy that will give Canadian retail high-net-worth investors access to a combination of private and public real asset investments. Additionally, we also launched our first actively managed equity ETF, the U.S. High Dividend ETF, managed by MIM; and
- Expanded and broadened our financial wellness offering in Global Retirement with the launch of new and enhanced financial management tools in the U.S. (Personal Finance Organizer) and Canada (PlanRight Through Mobile). We also expanded the availability of in-plan advice to a larger portion of our clients.

We continue to make progress on our digital customer leader strategy. In 2022, we:

- Continued to invest in our mobile app in U.S. Retirement, making significant improvements in the user experience that have resonated with customers and resulted in a 99% growth in users in 2022;
- Enhanced our digital experience in Canada Retirement with the launch of new features that enable members to make additional contributions to their Registered Retirement Savings Plans and to book one-on-one meetings with Manulife PlanRight financial advisors directly in the mobile app. This generated successful engagement, resulting in over 1,780 advisor meeting requests and a 14% increase in member adoption of the mobile app since the launch;
- Launched multiple new mobile app features in Hong Kong Retirement to enable our members to manage their investment portfolio with greater convenience, receive the latest market updates and get access to exclusive member benefits. These new features resulted in 156,000 customers opting for e-statements, and contributed to over 177,000 new mobile app downloads;
- Launched a new, end-to-end digital and mobile-friendly enrollment experience in Canada Retirement for our members. The improved enrollment experience offers a more intuitive and guided experience for our members, helping them feel more confident about their long-term investment choices. 82% of our eligible sponsors adopted the new experience for their employees in 2022; and
- Improved the website experience in U.S. Retail in 2Q22 by making it easier for customers to log-in, which resulted in a 45% decrease in customer log-in help inquiries in 2022 compared with the same period last year.

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 "Non-GAAP and Other Financial Measures" below). In each of the operating segments, we report all investment-related experience in items excluded from core earnings.

Profitability

Corporate and Other reported a net loss attributed to shareholders of $1,731 million in 2022 compared with a net loss attributed to shareholders of $792 million in 2021. Net income (loss) attributed to shareholders was comprised of core loss and items excluded from core loss. Core loss was $250 million in 2022 compared with a core loss of $161 million in 2021. Items excluded from core loss amounted to a net loss of $1,481 million in 2022 compared with a net loss of $631 million in 2021.

The unfavourable variance in core loss of $89 million was primarily attributable to a net charge of $159 million from the unfavourable impact of markets on seed money investments in new segregated funds and mutual funds in 2022 compared with a $27 million net gain in 2021, $120 million of higher interest on allocated capital to operating segments in 2022, higher charges in our P&C Reinsurance business compared with prior year and lower net gains on sales of AFS equities. These losses were partially offset by higher yields on fixed income investments, lower pension expenses that are primarily due to market impacts, and lower interest on external debt and withholding taxes.

Items excluded from core loss were a net loss of $1,481 million in 2022 compared with a net loss of $631 million in 2021. The unfavourable variance was primarily driven by larger losses on sales of AFS bonds and other direct impacts of markets, partially offset by the favourable impact of Canadian tax rate change in 2022.

The items excluded from core earnings are outlined below.

The table below presents net income (loss) attributed to shareholders for Corporate and Other for 2022 and 2021 consisting of core loss and items excluded from core loss.

For the years ended December 31, ($ millions)	**2022**	2021
Core loss excluding core investment gains	**$ (650)**	$ (561)
Core investment gains	**400**	400
Total core loss	**(250)**	(161)
Items excluded from core loss:[1]		
Direct impact of equity markets and interest rates[2]	**(1,266)**	(170)
Changes in actuarial methods and assumptions	**10**	(5)
Investment-related experience related to mark-to-market items[3]	**(67)**	59
Reclassification to core investment gains above	**(400)**	(400)
Restructuring charge[4]	**–**	(115)
Reinsurance transactions, tax-related items and other	**242**	–
Total items excluded from core loss	**(1,481)**	(631)
Net income (loss) attributed to shareholders	**$ (1,731)**	$ (792)

[1] For explanations of items excluded from core earnings, see "Items excluded from core earnings" table in the total Company "Profitability" section above.

[2] The direct impact of markets in 2022 included losses of $421 million related to sale of AFS bonds and losses on derivatives. Other losses were mostly from fixed income investments supporting a portion of the capital in Asia that are classified as fair value through profit and loss and other unfavourable market impacts. The direct impact of markets in 2021 included losses of $228 million related to the sale of AFS bonds and losses on derivatives, partially offset by gains from fixed income investments supporting a portion of the capital in Asia that are classified as fair value through profit and loss.

[3] Investment-related experience includes mark-to-market gains or losses on ALDA, other than gains on AFS equities and seed money investments in new segregated or mutual funds.

[4] Please see "Manulife Financial Corporation – Profitability" above for explanation of the restructuring charge.

Revenue

Revenue in 2022 was a loss of $1,204 million compared with a gain of $87 million in 2021. The $1,291 million decrease in revenue was primarily driven by higher losses from fixed income investments supporting a portion of the capital in Asia that are classified as fair value through profit and loss, higher realized losses on the sale of AFS bonds, declines in the fair value of seed money investments in 2022 compared with gains in the prior year, higher losses on derivative positions, higher interest on allocated capital and lower gains from AFS equities. These amounts were partially offset by higher yields on fixed income investments in 2022 and higher net premium income from our P&C Reinsurance business.

Revenue

For the years ended December 31, ($ millions)	2022	2021
Net premium income	$ 269	$ 147
Investment income (loss)	(1,200)	113
Other revenue(1)	(528)	(237)
Revenue before net realized and unrealized investment gains and losses and on the macro hedge program	(1,459)	23
Net realized and unrealized investment gains and losses(2) and on the macro hedge program	255	64
Total revenue	**$ (1,204)**	$ 87

(1) Includes a consolidation adjustment related to asset management fees earned by Global WAM from affiliated business (the offset to the consolidation adjustment is investment expense).

(2) See "Impact of Fair Value Accounting" section 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 2023 for a single event to be approximately US$300 million (net of reinstatement premiums) and for multiple events to be approximately US$600 million (net of all premiums).[1]

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[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 and our diversification strategy has historically produced superior risk adjusted returns while reducing overall risk. We use a disciplined approach across all asset classes. Our risk management strategy is outlined in the "Risk Management and Risk Factors" section below.

General Fund Assets

As at December 31, 2022, our general fund invested assets totaled $414.0 billion compared with $427.1 billion at the end of 2021. The following table shows the asset class composition as at December 31, 2022 and December 31, 2021.

As at December 31,	**2022**			2021		
($ billions)	Carrying value	% of total	Fair value	Carrying value	% of total	Fair value
Cash and short-term securities	**$ 19.2**	**5**	**$ 19.2**	$ 22.6	5	$ 22.6
Debt Securities and Private Placement Debt						
Government bonds	**72.4**	**17**	**72.2**	79.7	19	79.7
Corporate bonds	**129.1**	**32**	**129.0**	141.6	33	141.6
Securitized/asset-backed securities	**2.3**	**1**	**2.3**	2.9	1	2.9
Private placement debt	**47.1**	**11**	**42.0**	42.8	10	47.3
Mortgages	**54.6**	**13**	**51.4**	52.0	12	54.1
Policy loans and loans to bank clients	**9.7**	**2**	**9.7**	8.9	2	8.9
Public equities	**23.5**	**6**	**23.5**	28.1	7	28.1
Alternative Long-Duration Assets ("ALDA")						
Real Estate	**13.3**	**3**	**14.4**	13.2	3	14.4
Infrastructure	**12.8**	**3**	**13.0**	9.8	2	10.0
Timberland and Farmland	**6.0**	**1**	**6.5**	5.3	1	5.7
Private Equity	**14.3**	**3**	**14.3**	11.6	3	11.6
Oil & Gas	**2.2**	**1**	**2.2**	1.9	0	1.9
Other ALDA	**3.2**	**1**	**3.2**	2.6	1	2.6
Leveraged Leases and Other	**4.3**	**1**	**4.3**	4.1	1	4.1
Total general fund invested assets	**$ 414.0**	**100**	**$ 407.2**	$ 427.1	100	$ 435.5

The carrying values for invested assets are generally equal to their fair values, however, mortgages and private placement debt are carried at amortized cost; loans to bank clients are carried at unpaid 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; and private equity investments, including power and infrastructure, oil and gas, and timber, are accounted for as associates using the equity method, or at fair value. 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, 2022, the carrying value of renewable energy assets, including energy efficiency projects, was $13.6 billion (2021 – $13.1 billion).

Shareholders' accumulated other comprehensive pre-tax income (loss) at December 31, 2022 consisted of a $7.3 billion loss for bonds (2021 – gain of $873 million) and an $84 million loss for public equities (2021 – gain of $288 million). Included in the $7.3 billion loss for bonds was a $276 million loss related to the fair value hedge basis adjustments attributable to the hedged risk of certain AFS bonds that are in a gain position (2021 – loss of $293 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, 2022, our fixed income portfolio of $251.0 billion (2021 – $267.0 billion) was 96% investment grade (rated BBB or better) and 71% was rated A or higher (2021 – 97% and 72%, 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, 22% is invested in Canada (2021 – 23%), 48% is invested in the U.S. (2021 – 49%), 5% is invested in Europe (2021 – 4%) and the remaining 25% is invested in Asia and other geographic areas (2021 – 24%).

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

As at December 31, ($ billions)	2022 Debt securities	Private placement debt	Total	% of Total	2021 Debt securities	Private placement debt	Total	% of Total
AAA	**$ 33.7**	**$ 0.9**	**$ 34.6**	**14**	$ 40.1	$ 1.0	$ 41.1	15
AA	**36.3**	**7.0**	**43.3**	**17**	39.6	5.7	45.3	17
A	**83.5**	**16.5**	**100.0**	**40**	90.0	16.2	106.2	40
BBB	**46.1**	**17.2**	**63.3**	**25**	49.4	16.2	65.6	25
BB	**4.0**	**1.1**	**5.1**	**2**	3.7	1.1	4.8	2
B & lower, and unrated	**0.3**	**4.4**	**4.7**	**2**	1.4	2.6	4.0	1
Total carrying value	**$ 203.9**	**$ 47.1**	**$ 251.0**	**100**	$ 224.2	$ 42.8	$ 267.0	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 and its affiliated entities ("DBRS Morningstar"), 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 Management and Risk Factors" section below.

Debt Securities and Private Placement Debt – by Sector

As at December 31, (Per cent of carrying value, unless otherwise stated)	2022 Debt securities	Private placement debt	Total	2021 Debt securities	Private placement debt	Total
Government and agency	**36**	**10**	**31**	35	11	32
Utilities	**14**	**37**	**18**	14	38	18
Financial	**16**	**11**	**15**	15	10	15
Industrial	**9**	**14**	**9**	9	12	9
Consumer (non-cyclical)	**8**	**14**	**9**	8	14	9
Energy – Oil & Gas	**7**	**4**	**7**	8	5	7
Energy – Other	**0**	**0**	**0**	0	1	0
Consumer (cyclical)	**3**	**6**	**4**	3	6	3
Securitized (MBS/ABS)	**1**	**1**	**1**	1	1	1
Telecommunications	**2**	**0**	**2**	2	0	2
Basic materials	**2**	**3**	**2**	2	2	2
Technology	**1**	**0**	**1**	2	0	1
Media and internet and other	**1**	**0**	**1**	1	0	1
Total per cent	**100**	**100**	**100**	100	100	100
Total carrying value ($ billions)	**$ 203.9**	**$ 47.1**	**$ 251.0**	$ 224.2	$ 42.8	$ 267.0

As at December 31, 2022, gross unrealized losses on our fixed income holdings were $33.3 billion or 12% of the amortized cost of these holdings (2021 – $1.6 billion or 0.6%). Of this amount, $8.4 billion (2021 – $11 million) related to debt securities trading below 80% of amortized cost for more than 6 months. Securitized assets represented $228 million of the gross unrealized losses and none of the amounts trade below amortized cost for more than 6 months (2021 – $2 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 $6.6 billion as at December 31, 2022 (2021 – $7 million).

Mortgages

As at December 31, 2022, our mortgage portfolio of $54.6 billion represented 13% of invested assets (2021 – $52.0 billion and 12%, respectively). Geographically, 66% of the portfolio is invested in Canada (2021 – 66%) and 34% is invested in the U.S. (2021 – 34%). The overall portfolio is also diversified by geographic region, property type, and borrower. Of the total mortgage portfolio, 13% is insured (2021 – 14%), primarily by the Canada Mortgage and Housing Corporation ("CMHC") – Canada's AAA rated government-backed national housing agency, with 31% of residential mortgages insured (2021 – 35%) and 1% of commercial mortgages insured (2021 – 2%).

As at December 31, ($ billions)	**2022** Carrying value	**2022** % of total	2021 Carrying value	2021 % of total
Commercial				
Retail	**$ 8.7**	**16**	$ 8.8	17
Office	**9.1**	**17**	8.7	17
Multi-family residential	**7.4**	**13**	7.0	13
Industrial	**4.7**	**9**	3.6	7
Other commercial	**2.7**	**5**	3.0	6
	32.6	**60**	31.1	60
Other mortgages				
Manulife Bank single-family residential	**21.6**	**39**	20.5	39
Agricultural	**0.4**	**1**	0.4	1
Total mortgages	**$ 54.6**	**100**	$ 52.0	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, 2022 there were no loans in arrears. Geographically, of the total commercial mortgage loans, 44% are in Canada and 56% are in the U.S. (2021 – 44% and 56%, 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,	**2022** Canada	**2022** U.S.	2021 Canada	2021 U.S.
Loan-to-Value ratio(2)	**60%**	**56%**	61%	57%
Debt-Service Coverage ratio(2)	**1.57x**	**1.90x**	1.56x	1.87x
Average duration (years)	**4.27**	**6.31**	4.6	6.8
Average loan size ($ millions)	**$ 21.5**	**$ 21.1**	$ 19.4	$ 19.0
Loans in arrears(3)	**0.00%**	**0.00%**	0.00%	0.00%

(1) Excludes Manulife Bank commercial mortgage loans of $381 million (2021 – $393 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, 2022, public equity holdings of $23.5 billion represented 6% (2021 – $28.1 billion and 7%) of invested assets and, when excluding assets supporting participating policyholder and pass-through products, represented 1% (2021 – 1%) of invested assets. The portfolio is diversified by industry sector and issuer. Geographically, 29% (2021 – 28%) is held in Canada; 31% (2021 – 37%) is held in the U.S.; and the remaining 40% (2021 – 35%) is held in Asia, Europe, and other geographic areas.

Public Equities – classified by type of product-line supported

As at December 31, ($ billions)	**2022** Carrying value	**2022** % of total	2021 Carrying value	2021 % of total
Participating Policyholders	**$ 12.2**	**52**	$ 14.7	52
Non-participating products and pass-through products	**8.4**	**36**	9.6	34
Corporate and Other segment	**2.9**	**12**	3.8	14
Total public equities(1)	**$ 23.5**	**100**	$ 28.1	100

(1) Includes $1.6 billion of AFS equities and $1.3 billion of seed money investments in new segregated and mutual funds.

Alternative Long-Duration Assets ("ALDA")

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

As at December 31, 2022, carrying value of ALDA of $51.7 billion represented 12% (2021 – $44.4 billion and 10%) of invested assets. The fair value of total ALDA was $53.7 billion at December 31, 2022 (2021 – $46.3 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, 44% is located in the U.S., 39% in Canada, and 17% in Asia and Other as at December 31, 2022 (2021 – 42%, 42%, and 16%, 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 89% (2021 – 90%) and an average lease term of 5.1 years (2021 – 5.5 years). During 2022, we executed 2 acquisitions representing $0.09 billion market value of commercial real estate assets (2021 – 2 acquisitions and $0.03 billion, respectively). As part of ongoing portfolio management initiatives, 9 commercial real estate assets totaling $0.3 billion were sold during 2022.

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

As at December 31, ($ billions)	**2022** Fair value	**2022** % of total	2021 Fair value	2021 % of total
Company Own-Use	**$ 3.0**	**21**	$ 3.0	21
Office – Downtown	**4.3**	**30**	4.8	33
Office – Suburban	**1.1**	**8**	1.4	10
Industrial	**2.7**	**19**	2.2	15
Residential	**2.2**	**15**	1.9	13
Retail	**0.4**	**3**	0.4	3
Other	**0.7**	**4**	0.7	5
Total real estate(1)	**$ 14.4**	**100**	$ 14.4	100

(1) These figures represent the fair value of the real estate portfolio. The carrying value of the portfolio was $13.3 billion and $13.2 billion at December 31, 2022 and December 31, 2021, 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 over 600 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)	**2022** Carrying value	**2022** % of total	2021 Carrying value	2021 % of total
Power generation	**$ 4.3**	**34**	$ 3.9	40
Transportation (including roads, ports)	**3.6**	**28**	2.7	27
Electric and gas regulated utilities	**0.6**	**5**	0.4	5
Electricity transmission	**0.2**	**2**	0.1	1
Water distribution	**0.4**	**3**	0.2	2
Midstream gas infrastructure	**0.8**	**6**	0.7	7
Maintenance service, efficiency and social infrastructure	**0.4**	**3**	0.2	2
Telecommunications/Tower	**2.3**	**18**	1.5	15
Other infrastructure	**0.2**	**1**	0.1	1
Total infrastructure	**$ 12.8**	**100**	$ 9.8	100

Timberland & Farmland

Our timberland and farmland assets are managed by a proprietary entity, Manulife Investment Management Timberland and Agriculture ("MIM Timberland and Agriculture"). 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, Brazil, and Canada, MIM Timberland and Agriculture also manages farmland properties in the U.S., Australia, Chile, and Canada. The general fund's timberland portfolio comprised 22% of MIM Timberland and Agriculture's total timberland AUM (2021 – 22%). The farmland portfolio includes annual (row) crops, fruit crops, wine grapes, and nut crops. The general fund's holdings comprised 41% of MIM Timberland and Agriculture's total farmland AUM (2021 – 41%).

Private Equities

Our private equity portfolio of $14.3 billion (2021 — $11.6 billion) includes both directly held private equity and private equity funds. Both are diversified across vintage years and industry sectors.

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[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 $2.2 billion (2021 — $1.9 billion) in various oil and gas private equity interests which are a combination of both producing and mid-streaming assets.

Investment Income

For the years ended December 31, ($ millions, unless otherwise stated)	**2022**	2021
Interest income	**$ 12,290**	$ 11,517
Dividend, rental and other income[1]	**3,843**	4,180
(Impairments)/Recoveries	**(151)**	15
Other, including gains and losses on sale of AFS debt securities	**(775)**	(85)
Investment income before realized and unrealized gains on assets supporting insurance and investment contract liabilities and on macro equity hedges	**15,207**	15,627
Realized and unrealized gains and losses on assets supporting insurance and investment contract liabilities and on macro equity hedges		
Debt securities	**(32,675)**	(5,585)
Public equities	**(3,602)**	3,220
Mortgages and private placements	**394**	403
Alternative long-duration assets and other investments	**1,349**	3,772
Derivatives, including macro equity hedging program	**(10,543)**	(5,813)
	(45,077)	(4,003)
Total investment income (loss)	**$ (29,870)**	$ 11,624

[1] Rental income from investment properties is net of direct operating expenses.

In 2022, the $29.9 billion of investment loss (2021 – income of $11.6 billion) consisted of:

- $15.2 billion of investment income before net realized and unrealized gains on assets supporting insurance and investment contract liabilities and on macro equity hedges (2021 – gains of $15.6 billion); and
- $45.1 billion of net realized and unrealized losses on assets supporting insurance and investment contract liabilities and on macro equity hedges (2021 – losses of $4.0 billion).

The $0.4 billion decrease in net investment income before unrealized and realized losses was due to losses of $0.5 billion in other derivatives – mainly driven by Treasury Locks and longer tenor yield and $0.5 billion in stocks – mainly due to lower dividend distributions, partially offset by an increase of $0.4 billion in bonds.

In 2022, net realized and unrealized losses on assets supporting insurance and investment contract liabilities and on the macro hedge program were $45.1 billion compared with losses of $4.0 billion in 2021. The 2022 losses were primarily due to the impact of interest rate increases and lower equity markets. The 10-year government bonds for the U.S., Canada, and Hong Kong increased 236 bps, 186 bps and 211 bps, respectively. The S&P 500 decreased 19.4% and S&P/TSX decreased 8.7%. The 2021 losses were primarily due to the impact of interest rate increases partially offset by fair value gains in ALDA and higher equity markets.

Fair value accounting policies affect the measurement of both our assets and our liabilities. Refer to “Impact of Fair Value Accounting” above.

8. Fourth Quarter Financial Highlights

Profitability

As at and for the quarters ended December 31, ($ millions, unless otherwise stated)	**2022**	2021
Profitability:		
Net income attributed to shareholders	**$ 1,891**	$ 2,084
Core earnings[(1)]	**$ 1,746**	$ 1,708
Diluted earnings per common share ($)	**$ 0.95**	$ 1.03
Diluted core earnings per common share ($)	**$ 0.88**	$ 0.84
Return on common shareholders' equity ("ROE")	**14.4%**	15.6%
Core ROE	**13.2%**	12.7%

(1) Impact of currency movement on the fourth quarter of 2022 ("4Q22") core earnings compared with the fourth quarter of 2021 ("4Q21") was a $46 million favourable variance.

Manulife's 4Q22 net income attributed to shareholders was $1,891 million compared with $2,084 million in 4Q21. 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 $1,746 million in 4Q22 compared with $1,708 million in 4Q21, and items excluded from core earnings, which amounted to a net gain of $145 million in 4Q22 compared with a net gain of $376 million in 4Q21. Net income attributed to shareholders in 4Q22 decreased compared with 4Q21 primarily driven by losses from investment-related experience (compared with gains in the prior year) and a smaller gain from the direct impact of markets, partially offset by the favourable impact of an increase in the Canadian corporate tax rate and higher core earnings. Investment-related experience in 4Q22 reflected lower-than-expected returns (including fair value changes) on ALDA related to real estate, partially offset by the favourable impact of fixed income reinvestment activities and strong credit experience. The gain from the direct impact of markets in 4Q22 was primarily driven by gains due to the flattening of the yield curve in the U.S. and Canada and the impact of favourable equity market performance, partially offset by losses from corporate spread movements across several markets of differing magnitudes and from the sale of AFS bonds.

The 2% decrease in core earnings on a constant exchange rate basis compared with 4Q21 was driven by lower net fee income from lower average AUMA in Global WAM, lower new business gains in Asia and the U.S. and lower in-force earnings in U.S. Annuities of $55 million due to the variable annuity reinsurance transactions. These items were largely offset by higher yields on fixed income investments, gains on seed money investments and lower withholding taxes in Corporate and Other, improved policyholder experience in Canada and the U.S. and in-force business growth in Asia and Canada. 4Q22 core earnings included a net charge of $73 million ($82 million pre-tax) related to policyholder insurance and annuity experience compared with a net charge of $97 million ($120 million pre-tax) in 4Q21.[1] Actions to improve the capital efficiency of our legacy business resulted in $55 million lower core earnings in 4Q22 compared with 4Q21. Excluding these actions, in-force business increased 5%[2] compared with 4Q21.

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

For the quarters ended December 31, ($ millions)	**2022**	2021
Core earnings		
Asia	**$ 569**	$ 547
Canada	**350**	286
U.S.	**374**	467
Global Wealth and Asset Management	**267**	387
Corporate and Other (excluding core investment gains)	**86**	(79)
Core investment gains	**100**	100
Core earnings	**$ 1,746**	$ 1,708

In Asia, core earnings were $569 million in 4Q22 compared with $547 million in 4Q21. The 1% increase on a constant exchange rate basis was driven by favourable changes in new business product mix and in-force business growth, partially offset by the impact of lower new business volumes primarily in Hong Kong. In addition, higher investment income on allocated capital increased core earnings by US$12 million compared with 4Q21 (see Corporate and Other segment).

In Canada, core earnings were $350 million in 4Q22 compared with $286 million in 4Q21. The 22% increase primarily reflected experience gains in 4Q22 compared with losses in 4Q21 with contributions from all businesses, higher Manulife Bank earnings and higher insurance in-force earnings, partially offset by the impact of an increase in the corporate income tax rate and lower segregated fund in-force earnings due to lower equity markets.

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[1] Policyholder experience includes quarterly gains of nil post-tax in 4Q22 (4Q21 – gains of $5 million) from customers who have opted to change their existing medical coverage to the VHIS products in Hong Kong. These gains did not have a material impact on core earnings as they were offset by new business strain.

[2] Excludes $70 million (pre-tax) in 4Q22 of lost expected profit on in-force relating to the U.S. variable annuity reinsurance transaction. Percentage growth is based on the pre-tax impact of these actions, and is stated on a constant exchange rate basis.

In the U.S., core earnings were $374 million in 4Q22 compared with $467 million in 4Q21. The 25% decrease on a constant exchange rate basis was due to lower core earnings in both Annuities and Insurance. The decline in Annuities core earnings was driven by reduced in-force earnings of $55 million related to the two transactions to reinsure over 80%[1] of our U.S. variable annuity block in 2022. Annuities core earnings were also impacted by lower in-force earnings from unfavourable equity markets and lower policyholder experience gains. Insurance core earnings were lower primarily due to lower new business gains and lower other experience gains, partially offset by more favourable long-term care policyholder experience. Life insurance policyholder experience was neutral compared with 4Q21. In addition, higher investment income on allocated capital increased core earnings by US$6 million compared with 4Q21 (see Corporate and Other segment).

Global WAM core earnings were $267 million in 4Q22 compared with $387 million in 4Q21. The 34% decrease was driven by a decline in net fee income from lower average AUMA due to higher interest rates and equity market declines in 2022, and the non-recurrence of favourable tax benefits in 4Q21.

Corporate and Other core earnings excluding core investment gains were $86 million in 4Q22 compared with core loss of $79 million in 4Q21. The $165 million increase in core earnings was primarily due to higher yields on fixed income investments, $53 million of gains on seed money investments in segregated funds and mutual funds in 4Q22 compared with losses in the prior year and lower withholding taxes, partially offset by higher interest on allocated capital to operating segments.

The table below presents net income attributed to shareholders for the periods presented consisting of core earnings and the items excluded from core earnings.

For the quarters ended December 31,
($ millions)

	2022	2021
Core earnings	**$ 1,746**	$ 1,708
Items excluded from core earnings:		
Investment-related experience outside of core earnings(1)	**(457)**	126
Direct impact of equity markets and interest rates and variable annuity guarantee liabilities (see table below)	**184**	398
Direct impact of equity markets and variable annuity guarantee liabilities(2)	***109***	*124*
Fixed income reinvestment rates assumed in the valuation of policy liabilities(3)	***130***	*454*
Sale of AFS bonds and derivative positions in the Corporate and Other segment	***(55)***	*(180)*
Reinsurance transactions, tax-related items and other(4)	**418**	(148)
Total items excluded from core earnings	**145**	376
Net income (loss) attributed to shareholders	**$ 1,891**	$ 2,084

(1) Total investment-related experience in 4Q22 was a net charge of $357 million, compared with a net gain of $226 million in 4Q21, and in accordance with our definition of core earnings, we included $100 million in investment-related experience gains in core earnings and a $457 million loss in items excluded from core earnings in 4Q22 ($100 million in investment gains and $126 million, respectively, in 4Q21). Investment-related experience charge in 4Q22 reflected lower-than-expected returns (including fair value changes) on ALDA related to real estate, partially offset by the favourable impact of fixed income reinvestment activities and strong credit experience. Investment-related experience gains in 4Q21 reflected higher-than-expected returns (including fair value changes) on ALDA primarily driven by gains on private equity and infrastructure as well as strong credit experience, partially offset by the unfavourable impact of fixed income reinvestment activities primarily driven by the acquisition of US Treasury bills.

(2) In 4Q22, the net gain related to equity markets of $109 million included a gain of $126 million from gross equity exposure, partially offset by a loss of $14 million from dynamic hedge experience and a modest charge of $3 million from macro hedging experience. In 4Q21, the net gain related to equity markets of $124 million included a gain of $145 million from gross equity exposure, partially offset by a loss of $20 million from dynamic hedging experience and a modest charge of $1 million from macro hedge experience.

(3) The $130 million gain in 4Q22 due to fixed income reinvestment rates was driven by gains due to the flattening of the yield curve in the U.S. and Canada and the impact of favourable equity market performance, partially offset by losses from corporate spread movements across several markets of differing magnitudes and from the sale of AFS bonds. The $454 million gain in 4Q21 was driven by flattening of the yield curve in Canada and the U.S. and, to a lesser extent, widening corporate spreads in the U.S.

(4) The $418 million gain in 4Q22 includes $297 million related to the favourable impact of an increase in the Canadian corporate tax rate, $86 million net gain from acquiring full ownership interest of MTEDA by purchasing the remaining 51% of shares from our joint venture partner and a $35 million gain from a reinsurance transaction in the U.S. 4Q21 includes a $119 million charge related to updating the impact of the 2017 U.S. Tax Cuts and Jobs Act and a $37 million charge from a reinsurance transaction in the U.S., partially offset by Asia reinsurance transaction gains of $8 million in 4Q22.

Net income attributed to shareholders by segment is presented in the following table.

For the quarters ended December 31,
($ millions)

	2022	2021
Net income attributed to shareholders by segment		
Asia	**$ 569**	$ 645
Canada	**320**	616
U.S.	**410**	494
Global Wealth and Asset Management	**347**	387
Corporate and Other	**245**	(58)
Total net income attributed to shareholders	**$ 1,891**	$ 2,084

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[1] Represents a reduction in guarantee value on our total U.S. variable annuity block compared with December 31, 2021. Guarantee value on our U.S. variable annuity Guaranteed Minimum Withdrawal Benefits block reduced by more than 90% compared with December 31, 2021.

Business Performance

As at and for the quarters ended December 31,

($ millions, unless otherwise stated)	2022	2021
Asia APE sales	$ 829	$ 890
Canada APE sales	252	295
U.S. APE sales	208	244
Total APE sales	1,289	1,429
Asia new business value	339	391
Canada new business value	87	82
U.S. new business value	99	82
Total new business value	525	555
Global Wealth and Asset Management gross flows ($ billions)	32.6	36.0
Global Wealth and Asset Management net flows ($ billions)	(8.3)	8.1
Global Wealth and Asset Management assets under management and administration ($ billions)	779.9	855.9
Global Wealth and Asset Management total invested assets ($ billions)	3.7	4.5
Global Wealth and Asset Management segregated funds net assets ($ billions)	224.2	252.6
Total assets under management and administration ($ billions)	1,314.6	1,425.8
Total invested assets ($ billions)	414.0	427.1
Total net segregated funds net assets ($ billions)	348.6	399.8

Sales

APE sales were $1.3 billion in 4Q22, a decrease of 12% compared with 4Q21. In Asia, APE sales decreased 9% compared with 4Q21, reflecting lower sales in Hong Kong, partially offset by higher individual protection and other wealth sales in Japan and higher sales in Asia Other[1]. In Hong Kong, APE sales decreased 35% compared with 4Q21 driven by the impact of weaker customer sentiment on financial planning decisions. In Japan, APE sales increased 15% compared with 4Q21 as a result of higher individual protection and other wealth sales. Asia Other APE sales increased 2% compared with 4Q21, reflecting higher bancassurance and agency sales in mainland China, partially offset by lower agency sales in Vietnam, Singapore and Other Emerging Markets. In Canada, APE sales decreased 15% compared with 4Q21, primarily driven by lower segregated fund and participating insurance sales, partially offset by higher small business group insurance sales. In the U.S., APE sales decreased 21% compared with 4Q21 due to lower sales of domestic life insurance products, partially offset by an increase in international sales, which are reported as part of the U.S. segment results. Demand for domestic life insurance products purchased primarily to protect household income declined. Demand also decreased for domestic life insurance products purchased primarily for estate planning due to volatility in equity markets. APE sales of products with the John Hancock Vitality PLUS feature decreased 20% compared with 4Q21, reflecting the decrease in sales of domestic life insurance products.

New Business Value was $525 million in 4Q22, a decrease of 9% compared with 4Q21. In Asia, NBV decreased 17% compared with 4Q21 reflecting lower sales in Hong Kong and unfavourable changes in product mix in Asia Other, partially offset by the benefit of higher interest rates, and higher individual protection and other wealth sales in Japan. In Canada, NBV increased 6% compared with 4Q21, driven by higher margins in our insurance businesses, partially offset by lower volumes in annuities. In the U.S., NBV increased 12% compared with 4Q21, driven by higher interest rates, higher international sales volumes and product actions, partially offset by lower brokerage sales volumes.

Global Wealth and Asset Management net outflows were $8.3 billion in 4Q22 compared with net inflows of $8.1 billion in 4Q21. Net outflows in Retirement were $4.6 billion in 4Q22 compared with net outflows of $1.0 billion in 4Q21, driven by higher plan redemptions and lower new plan sales in the U.S. Net outflows in Retail were $4.7 billion in 4Q22 compared with net inflows of $7.5 billion in 4Q21, reflecting higher redemptions and lower gross flows driven by decreased investor demand. Net inflows in Institutional Asset Management were $0.9 billion in 4Q22 compared with net inflows of $1.6 billion in 4Q21, driven by lower net flows in real estate, timberland, and infrastructure products, partially offset by higher sales of fixed income mandates.

Global Wealth and Asset Management gross flows were $32.6 billion in 4Q22, a decrease of 13% compared with 4Q21. Retirement gross flows in 4Q22 were $12.1 billion, a decrease of 9% compared with 4Q21, reflecting lower new plan sales in the U.S. Retail gross flows in 4Q22 were $15.2 billion, a decrease of 23% compared with 4Q21, driven by lower investor demand amid higher interest rates and equity market declines in 2022. Institutional Asset Management gross flows in 4Q22 were $5.2 billion, an increase of 19% compared with 4Q21, mainly due to higher sales of fixed income mandates, partially offset by lower infrastructure and real estate gross flows.

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[1] Asia Other excludes Hong Kong and Japan.

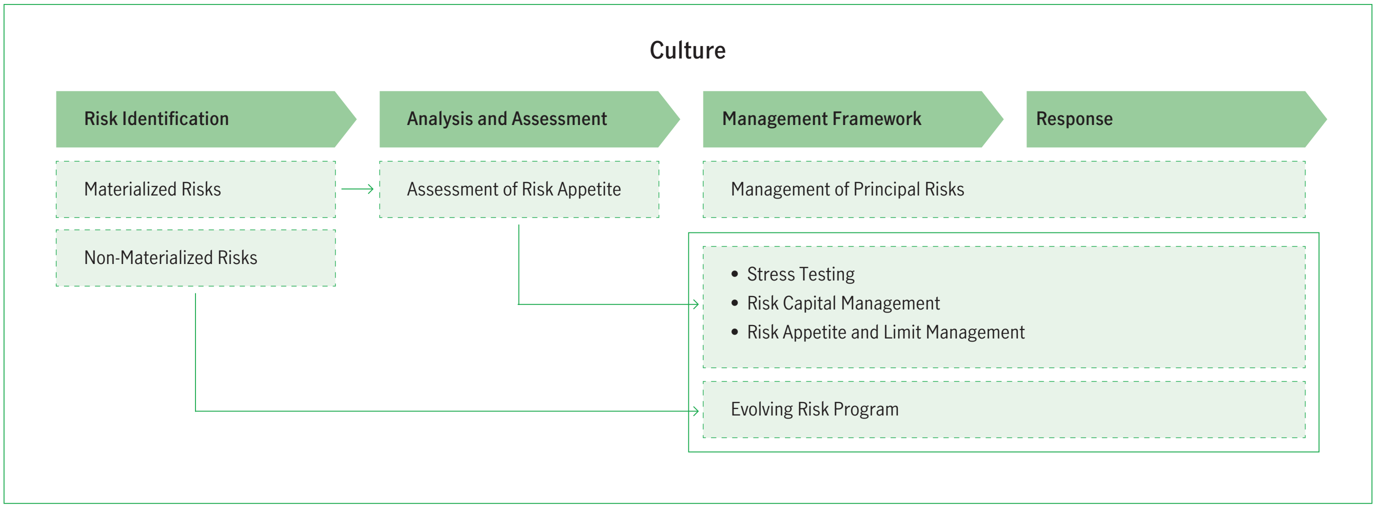
9. Risk Management and Risk Factors

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 be the most digital, customer-centric global company in our industry. 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 such that risk appetite is neared or exceeded.

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, Global Function Heads and all business operations personnel. 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.

Risk 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 MFC's board of directors (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.
- **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 maintaining a supportive environment to ensure appropriate incentives for continued transparency and lessons learned.

Risk Governance

The Board oversees our culture of integrity and ethics, strategic planning, risk management, and corporate governance, among other things. The Board 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 and procedures, including environmental, social and governance related matters, including climate change, among other activities.

The CEO is directly accountable to the Board 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.

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

The ERC approves and oversees the execution of the Company's enterprise risk management program. It establishes and presents for approval to the Board 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. The Company's risk appetite 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 through the development and deployment of innovative product solutions, and providing customer-centric digital experiences;
- 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;
- To safeguard the well-being of our employees, and promote a diverse, equitable and inclusive business environment;
- To consider environmental, social, and governance (ESG) impacts across our business activities and community impact;
- 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 that we believe 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;
- 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 that 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.

The results of the Financial Condition Test and Own Risk and Solvency Assessment are presented to the Board annually by our Chief Actuary and CRO, respectively. Our Chief Auditor reports the results of internal audits of risk controls and risk management programs to the Audit Committee and the Board's Risk Committee annually. Management reviews the implementation of key risk management strategies, and their effectiveness, with the Board's Risk Committee annually.

Risk Control and Mitigation

Risk control activities in place throughout the Company are designed 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 to which our businesses, operations and financial condition are subjected to, grouped under five principal risk categories: strategic risk, market risk, credit risk, product risk and operational risk. The following sections describe the risk management strategies and risk factors for each principal risk category.

The risks described below are not the only ones we face. Additional risks not presently known to us or that are currently immaterial could also impair our businesses, operations and financial condition in the future. If any of such risks should occur, the trading price of our securities, including common shares, preferred shares and debt securities, could decline, and investors may lose all or part of their 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.

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, Executive Leadership Team, and the ERC;
- Performance and risk reviews of all key businesses with the CEO and annual reviews with the Board;
- 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.

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 Reputation Risk 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 could arise from our inability to adapt to evolving ESG issues, including climate change, and may impact our investments, underwriting, and operations, which could lead to adverse financial, operational, legal, reputational, or brand value risks for Manulife due to our actual or perceived actions, or inaction in relation to ESG issues.

The Board's Corporate Governance and Nominating Committee ("CGNC") oversees Manulife's ESG framework, including matters related to climate change. On a regular basis, the CGNC is updated on relevant ESG topics, including our progress against the commitments set out in Manulife's Climate Action Plan. Starting in 2023, each member of the CGNC will also participate in at least one externally facilitated ESG-related educational activity every two years. The CGNC's oversight complements Manulife's Executive Sustainability Council ("ESC"), which consists of the Chief Executive Officer, the Chief Sustainability Officer, the Chief Risk Officer and other members of the Executive Leadership Team. As part of its mandate, the ESC is responsible for guiding the development and execution of our climate strategy, including climate-related risk management activities. The ESC meets monthly and is supported by the ESG Centre of Expertise ("CoE"), which consists of corporate function and business unit leads tasked with integrating sustainability into our business practices and a Legal and Compliance ESG CoE, whose purpose is to share information and advice relating to ESG activities across Manulife. Manulife's Climate Change Taskforce, a cross-functional team, is responsible for the execution of the Climate Action Plan and manages climate-related performance and disclosures. Additionally, our global executive Diversity, Equity and Inclusion ("DEI") Council, which includes members of the Executive Leadership Team and is chaired by the CEO, meets quarterly and guides, supports, and facilitates the implementation of our DEI strategy, encourages innovative thinking about DEI challenges and opportunities, and drives and builds accountability for DEI throughout the organization.

Climate Risk

Consistent with the Financial Stability Board's Taskforce on Climate-Related Financial Disclosures ("TCFD"), Manulife defines climate-related risks as the potential negative impacts from climate change, which may be experienced directly (e.g., through financial loss) or indirectly (e.g., through reputational harm), resulting from the physical impacts of climate change or the transition to a low-carbon economy.

Climate risk is a risk with unique characteristics given the diverse set of pathways in which risks can manifest. As such, it is a transversal risk, that has the potential to impact any of our principal risks, including strategic, market, credit, product, or operational risk, as well as legal and reputational risk. Climate risk, therefore, is viewed as a modifier or an accelerator of existing risk types, and failure to adequately prepare for the potential impacts of climate change can have material adverse impacts on our balance sheet or our ability to operate.

Potential impacts of climate change may include business losses or disruption resulting from extreme weather conditions, challenges in adapting to changes in climate-related legal or regulatory frameworks, reputational damage, devaluation of our debt or equity asset exposures to fossil-fuel related or high-emitting industries, or increased mortality or morbidity resulting from climate related events.

We continue to enhance the integration of climate-related risks into our enterprise risk management 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). Our Environmental Risk Policy and other relevant policies and standards are used to guide business operations on climate risk identification and assessment. GRM continues to enhance risk management practices to consider the potential impacts from climate-related risk, including in our investment decision-making processes, life insurance underwriting due diligence, and assessment of operational risks and controls.

The Executive Risk Committee and the Risk Committee of the Board consider climate-related risks and opportunities through the ongoing monitoring and reporting of emerging risks. Risk management activities addressing climate-related risks are expected to continue to evolve over time as knowledge and capabilities further mature, and as applicable standards, frameworks and methodologies continue to emerge and coalesce.

Manulife is a long-term oriented underwriter and investor. Therefore, climate-related risks and opportunities, including changes in the physical environment and policy and technological changes associated with the transition to a low-carbon economy, are strategically relevant and, in some cases, could become material to our business over time. In 2022, we continued to monitor climate-related risks and opportunities within our business strategy over short (1-5 year), medium (5-15 year), and long (beyond 15 years) time horizons to better assess the relative significance of potential impacts and how and when actions will be required to address such impacts.

Our Climate Action Plan (released in May 2021) focuses on three areas, our operations, our general fund investments, and the products and services we offer to clients. It includes our commitment to achieve net zero financed emissions by 2050, and our commitment to reduce our absolute scope 1 and 2 emissions by 35% by 2035.[1] We are also taking a combined sector and asset class approach to establish ambitious near term decarbonization targets for our financing activities in the general fund. Interim targets for real estate, power generation project finance, and listed equities and debt are being developed in line with the target-setting methodology of the Science-Based Targets Initiative ("SBTi"), a leading global standard for setting carbon emission reduction targets in line with global decarbonization ambitions to limit global warming. Interim target-setting activities for additional heavy emitting industries not covered by SBTi are also under development.

Through our general fund we continue to make targeted investments in green asset categories (such as energy efficiency, sustainably certified timberlands, and renewable energy). We also continue to develop investment products and solutions for climate change mitigation and resilience through Manulife Investment Management.

For additional information regarding strategic risks associated with Manulife's sustainability commitments, see "Strategic Risk Factors – We may not be able to achieve our sustainability commitments, or our commitments may not meet the expectations of stakeholders or regulators". Please also refer to our annual "Environmental, Social and Governance Report", published in the second quarter of each year, for detailed disclosure on our alignment with the TCFD recommendations and our ESG performance.

Strategic Risk Factors

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

- The global macroeconomic environment has a significant impact on our financial plans and ability to implement our business strategy. The macroeconomic environment can be significantly impacted by the actions of both the government sector (including central banks) and the private sector. The macroeconomic 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 in which we operate. Actual economic growth can be significantly impacted by the macroeconomic environment and can deviate significantly from forecasts, thus impacting our financial results and the ability to implement our business strategy.
- 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.
- Changes in the macroeconomic 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 macroeconomic environment may result in changes to the assumptions themselves which would also impact our financial results.
- Specific changes in the macroeconomic 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.
- A rise in geopolitical tensions either within or outside of jurisdictions in which we operate can trigger changes in the macroeconomic environment which can have various impacts across our business. For example, economic sanctions imposed on a country could adversely impact our ability to achieve specific business objectives in that region. Military conflicts could drive financial and economic dislocations across global capital markets, supply chains or commodity markets. See also "Operational Risk Factors – Our operations face political, legal, operational and other risks that could negatively affect those operations or our results of operations and financial condition."

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

- The spending and savings patterns of our customers could be significantly influenced by the macroeconomic 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 macroeconomic 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.
- An elevated risk for stagflation, increased unemployment, inflation and economic uncertainty in certain parts of the global markets may result in adverse policyholders' behaviour (such as higher withdrawals, lapses, lower premium deposits and lower policy persistency than anticipated), higher expenses and cost of fundings, along with other adverse impacts from higher rates due to inflationary pressure as mentioned in the Market Risk Factors section. These impacts could have a material adverse effect on our business, financial condition, results of operations, and cash flows.

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 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 15, 2023 and note 19 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 Management and Risk Factors – Strategic Risk" section, which could impact our net income attributed to shareholders and/or capital position are provided below.
  - The International Association of Insurance Supervisors ("IAIS") is still developing elements of its global frameworks for supervision of internationally active insurance groups ("IAIGs"). This includes a risk-based global Insurance Capital Standard ("ICS") which is undergoing a five-year monitoring period through 2025 to inform its development. While broadly supportive of the goals of ICS, OSFI stated that they did not support the ICS design adopted by the IAIS in 2019 for use in 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 impact of the frameworks on capital and other regulatory requirements and Manulife's competitive position remains unknown and is being monitored.

  The Holistic Framework for the assessment and mitigation of systemic risk in the insurance sector was adopted by the Financial Stability Board ("FSB") in December 2022 and the annual identification process of some IAIGs as Globally Systemically Important Insurers ("G-SIIs"), which had been paused since 2019, has been discontinued. See "Emerging Risks – Regulatory Capital" section below.

  - 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. In Michigan, which is the lead state for NAIC regulation of John Hancock, the Michigan Insurance Code was recently amended to adopt the NAIC Group Capital Calculation model language.
- The Canadian 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.
- Increasingly, global financial regulators are promulgating guidance related to climate change and its potential impacts on financial services firms. OSFI, the SEC and several regulators across Asia have begun to engage industry to assess the impacts of climate change and to set expectations on establishing climate transition plans, including ensuring effective risk management and governance structures to manage climate change-related risks. There are also increasing expectations from investors, regulators, and other stakeholders to provide comparable, decision-useful data and reporting on climate change-related risks and opportunities, including performance metrics such as an organization's Scope 1, 2 and 3 carbon emissions. Regulatory disclosure requirements are guided by private sector bodies, where there is a convergence in the industry around sustainability reporting frameworks. The IFRS Foundation's International Sustainability Standards Board ("ISSB") is one such body and has published draft standards for a comprehensive global baseline of sustainability disclosures for capital markets.
- 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 WAM 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, along with the resulting damage to our reputation.

- From time to time, regulators raise issues during examinations or audits of Manulife that could have a material adverse impact on us. We cannot predict whether or when regulatory actions may be taken that could adversely affect our operations. 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 15, 2023 and note 19 of the 2022 Annual Consolidated Financial Statements. See also “Operational Risk Factors – 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.
- In 2021, 136 of the 140 members of the Organization for Economic Co-Operation and Development (“OECD”) / G20 Inclusive Framework agreed on a two-pillar solution to address tax challenges from the digital economy, and to close the gaps in international tax systems. These include a new approach to allocating certain profits of multinational entities amongst countries and a global minimum income tax rate of 15%. On April 7, 2022, the Canadian government reaffirmed its commitment to the two-pillar solution in its 2022 Budget statement. The Company is closely monitoring developments and potential impacts and, in particular, for issues unique to the insurance industry. If enacted, we expect an increase in the effective tax rate, pending further details on timing and specific implementation in both Canada and other affected countries.
- The Canada Recovery Dividend and permanent corporate tax rate increase for certain financial institutions were enacted in 2022. Both tax measures apply to Canada’s insurance and banking operations. The Canada Recovery Dividend is a one-time 15% tax applicable to the average taxable income for 2020 and 2021 in excess of $1 billion and is not a material cost to the Company. The 1.5% corporate tax rate increase on Canadian taxable income over $100 million had an immediate favourable impact on the value of our existing deferred tax assets in the fourth quarter of 2022 that will be offset over time by a slight increase to our effective tax rate as future Canadian insurance and banking earnings are taxed at the new higher federal corporate tax rate of 16.5%.
- Rules to govern the transition to IFRS 17 for Canadian tax purposes were enacted in late 2022 and became effective January 1, 2023. A five-year transition period for both insurance reserves and revaluations of investments under IFRS 9 should generally smooth the current tax impact of the change in accounting standards but is not expected to have a material effect on the Company’s annual cash tax payable.
- The U.S. Inflation Reduction Act of 2022 was signed into law on August 16, 2022, which includes a 15% minimum tax based on financial statement income, starting in 2023. Many related regulations remain to be drafted to clarify how the tax will operate, but at this time we do not expect our IFRS effective tax rate to be materially affected by this new tax, though the timing of cash tax payments could be accelerated.

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 and market 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 and market 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. Please also refer to "Emerging Risks – IFRS 17 and IFRS 9" below.
- 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 for competitive reasons, 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 order 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 mergers with, or acquisitions and dispositions of, businesses or difficulties integrating acquired businesses.

- We have engaged in mergers with, or 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 mergers with, or acquisitions and dispositions 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. Mergers with, or acquisitions and dispositions 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 2023 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 registrations, 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 and protecting 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. As the occurrence of potential infringements or misappropriations against our intellectual property increases, we may have to litigate more often 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 primarily 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.

We may not be able to achieve our sustainability commitments, or our commitments may not meet the expectations of stakeholders or regulators.

- We continue to build on our sustainability commitments, including our climate-related commitments, as set out in our sustainability strategy, and continue to adopt policies and processes to manage these commitments, in alignment with our business priorities. Internal or external circumstances could affect our ability to successfully meet some or all of our sustainability commitments. Our commitments could also materially change in the future and this could affect stakeholders' evaluation of us and lead to adverse reputational impact.
- Our progress towards the commitments is disclosed periodically, which allows our stakeholders, including shareholders, customers and employees, to evaluate our business based on our advancement towards these commitments. Our reporting on our progress relies on various external frameworks, methodologies, taxonomies and other standards, which may change over time, resulting in changes to or restatements of our reporting processes and results. Stakeholders may also evaluate our business by their own sustainability criteria which may not be consistent with our own criteria or performance indicators, which could result in varying levels of expectations for which we may not be able to entirely satisfy.
- The availability of quality and reliable data, including issuer data, is a notable factor in our ability to set targets, make effective decisions against, and report our progress towards our targets and strategic areas of focus for our general fund. However, as a consequence of incomplete, inadequate, or unavailable data, our targets, and our progress toward achieving them, may need to be revisited.
- Interim targets support us in understanding how our investments can contribute to decarbonization of the real economy and provide guideposts against which to measure our progress towards our targets, including our targets to support ambitious global decarbonization commitments as validated by SBTi. However, our targets, and our progress toward achieving them, may need to be revisited if the assumptions underlying net zero scenarios and pathways prove incorrect, or if regulatory, economic, technological and other external factors needed to enable such scenarios and pathways fail to evolve.
- As regulators start to adopt mandatory sustainability related disclosure requirements and investment criteria and taxonomies, there is an increasing possibility of regulatory sanctions, including fines, and litigations. As a result, we may face adverse investor, media, or public scrutiny which may negatively impact our financial results and reputation.

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.

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, 2022 and December 31, 2021. The fact that certain text and tables are considered an integral part of the Consolidated Financial Statements does not imply that the disclosures are of any greater importance than the sections not part of the disclosure. Accordingly, the "Risk Management and Risk Factors" 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				
	Public Equity Risk	Interest Rate and Spread Risk	ALDA 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					✓

Public Equity Risk – To manage public equity 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. See "Market Risk Factors" below.

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 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 fund 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 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, 2022, the Company held $241.0 billion in cash and 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 $268.4 billion as at December 31, 2021 as noted in the table below.

As at December 31, ($ millions, unless otherwise stated)	**2022**	2021
Cash and cash equivalents	**$ 19,153**	$ 22,594
Marketable assets		
Government bonds (investment grade)	**70,508**	77,743
Corporate bonds (investment grade)	**126,827**	138,479
Securitized — ABS, CMBS, RMBS (investment grade)	**2,285**	2,892
Public equities	**22,223**	26,706
Total marketable assets	**221,843**	245,820
Total cash and cash equivalents and marketable assets(1)	**$ 240,996**	$ 268,414

(1) Including $13.3 billion encumbered cash and cash equivalents and marketable assets as at December 31, 2022 (2021 – $6.6 billion).

We have established a variety of contingent liquidity sources. These include, among others, a $500 million committed unsecured revolving credit facility with certain Canadian chartered banks available for MFC, and a US$500 million committed unsecured revolving credit facility with certain U.S. banks available for MFC and certain of its U.S. subsidiaries. There were no outstanding borrowings under these facilities as of December 31, 2022 (2021 – nil). 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, 2022, JHUSA had an estimated maximum borrowing capacity of US$3.8 billion (2021 – US$4.4 billion) based on regulatory limitations with an outstanding balance of US$500 million (2021 – 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, 2022 ($ millions)	Less than 1 year	1 to 3 years	3 to 5 years	Over 5 years	Total
Long-term debt	**$ –**	**$ –**	**$ 2,661**	**$ 3,573**	**$ 6,234**
Capital instruments	**–**	**615**	**–**	**5,507**	**6,122**
Derivatives	**2,656**	**1,956**	**1,146**	**8,531**	**14,289**
Deposits from Bank clients(2)	**16,884**	**3,000**	**2,623**	**–**	**22,507**
Lease liabilities	**112**	**154**	**93**	**61**	**420**

(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, 2022 was $22,507 million and $22,271 million, respectively (2021 – $20,720 million and $20,746 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 (2021 – 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 $477.7 billion as at December 31, 2022 (2021 – $502.4 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 guarantee values. Depending on future equity market levels, liabilities on current in-force business would be due primarily in the period from 2023 to 2043.

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)	2022 Guarantee value(1)	 Fund value	 Net amount at risk(1),(2),(3)	2021 Guarantee value(1)	 Fund value	 Net amount at risk(1),(2),(3)
Guaranteed minimum income benefit	$ 4,357	$ 2,723	$ 1,639	$ 4,419	$ 3,603	$ 918
Guaranteed minimum withdrawal benefit	38,319	34,203	5,734	39,098	41,809	2,233
Guaranteed minimum accumulation benefit	20,035	19,945	221	19,820	20,226	12
Gross living benefits(4)	62,711	56,871	7,594	63,337	65,638	3,163
Gross death benefits(5)	10,465	15,779	2,156	11,105	22,920	618
Total gross of reinsurance	73,176	72,650	9,750	74,442	88,558	3,781
Living benefits reinsured	26,999	23,691	4,860	3,788	3,102	771
Death benefits reinsured	3,923	2,636	1,061	639	547	253
Total reinsured	30,922	26,327	5,921	4,427	3,649	1,024
Total, net of reinsurance(6)	$ 42,254	$ 46,323	$ 3,829	$ 70,015	$ 84,909	$ 2,757

(1) Guarantee Value and Net Amount at Risk in respect of guaranteed minimum withdrawal business in Canada and the U.S. have been updated in 2021 to reflect the time value of money of these claims.

(2) 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. 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 and assumes that all claims are immediately payable. 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 assumes that the benefit is paid as a lifetime annuity commencing at the earliest contractual income start age. 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.

(3) The amount at risk net of reinsurance at December 31, 2022 was $3,829 million (2021 – $2,757 million) of which: US$737 million (2021 – US$1,336 million) was on our U.S. business, $2,154 million (2021 – $886 million) was on our Canadian business, US$275 million (2021 – US$53 million) was on our Japan business and US$224 million (2021 – US$87 million) was related to Asia (other than Japan) and our run-off reinsurance business.

(4) 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 5.

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

(6) Reinsured amounts at December 31, 2022 reflect the U.S. variable annuity reinsurance transactions effected on February 1, 2022 and October 3, 2022.

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	2022	2021
Equity funds	$ 42,506	$ 52,528
Balanced funds	36,290	43,783
Bond funds	9,336	10,965
Money market funds	1,924	1,844
Other fixed interest rate investments	2,029	1,917
Total	$ 92,085	$ 111,037

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 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 hedge assets. While we cannot reliably estimate the amount of the change in dynamically hedged variable annuity guarantee liabilities that will not be offset by the profit or loss on the dynamic hedge assets, we make certain assumptions for the purposes of estimating the impact on net income attributed to shareholders.

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

It is also important to note that these estimates are illustrative, and that the 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, 2022 ($ millions)	-30%	-20%	-10%	+10%	+20%	+30%
Underlying sensitivity to net income attributed to shareholders(4)						
Variable annuity guarantees	**$ (1,100)**	**$ (660)**	**$ (300)**	**$ 240**	**$ 450**	**$ 610**
General fund equity investments(5)	**(1,520)**	**(1,010)**	**(500)**	**420**	**820**	**1,220**
Total underlying sensitivity before hedging	**(2,620)**	**(1,670)**	**(800)**	**660**	**1,270**	**1,830**
Impact of macro and dynamic hedge assets(6)	**850**	**530**	**240**	**(230)**	**(420)**	**(570)**
Net potential impact on net income attributed to shareholders after impact of hedging(7)	**$ (1,770)**	**$ (1,140)**	**$ (560)**	**$ 430**	**$ 850**	**$ 1,260**

As at December 31, 2021 ($ millions)	-30%	-20%	-10%	+10%	+20%	+30%
Underlying sensitivity to net income attributed to shareholders(4)						
Variable annuity guarantees	$ (2,560)	$ (1,480)	$ (630)	$ 440	$ 750	$ 960
General fund equity investments(5)	(1,430)	(890)	(440)	450	880	1,320
Total underlying sensitivity before hedging	(3,990)	(2,370)	(1,070)	890	1,630	2,280
Impact of macro and dynamic hedge assets(6)	2,060	1,190	500	(470)	(820)	(1,110)
Net potential impact on net income attributed to shareholders after impact of hedging(7)	$ (1,930)	$ (1,180)	$ (570)	$ 420	$ 810	$ 1,170

(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).

(7) The sensitivity on net income attributed to shareholders from changes in public equity returns after the impact of hedging is largely unchanged as at December 31, 2022 compared with December 31, 2021. This is primarily driven by the decline in sensitivities in 1Q22 as a result of the U.S. variable annuity reinsurance transaction being largely offset by the net increase in sensitivities from the second quarter of 2022 ("2Q22") to 4Q22 as a result of the impact of equity market declines on our variable universal life business projected fee income.

The following table shows the potential impact to MLI's LICAT ratio resulting from changes in public equity market values.

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

	Impact on MLI's LICAT ratio					
Percentage points	-30%	-20%	-10%	+10%	+20%	+30%
December 31, 2022	**(1)**	**(1)**	**–**	**–**	**1**	**1**
December 31, 2021	(1)	–	–	–	1	–

(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, 2022, we estimated the sensitivity of our net income attributed to shareholders to a 50 basis point parallel decline in interest rates to be a charge of $100 million, and to a 50 basis point parallel increase in interest rates to be a benefit of $100 million.

The table below shows the potential impact on net income attributed to shareholders from a 50 basis point parallel move in interest rates. This includes a change of 50 basis points in current government, swap and corporate rates for all maturities across all markets with no change in credit spreads between government, swap and corporate rates, and with a floor of zero on government rates where government rates are not currently negative (currently zero floor applies to all countries we operate in except Japan), 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 ASB. 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. In 2021, the ASB issued a new promulgation 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 and was effective October 15, 2021. At December 31, 2022, 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 $300 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 2.9% and we use the same assumption for the U.S. Our assumption for Japan is 1.5%.

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 on net income attributed to shareholders 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 (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 ratios and vice-versa.

The following table shows the potential impact on net income attributed to shareholders as well as 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 ratio of an immediate parallel change in interest rates relative to rates assumed in the valuation of policy liabilities(1),(2),(3),(4)

	2022		2021	
As at December 31,	-50bp	+50bp	-50bp	+50bp
Net income attributed to shareholders ($ millions)	**$ (100)**	**$ 100**	$ (200)	$ nil
Changes in other comprehensive income from fair value changes in AFS fixed income assets held in the Corporate and Other segment ($ millions)	**1,500**	**(1,400)**	2,100	(1,900)
MLI’s LICAT ratio (change in percentage points)(5)	**3**	**(2)**	5	(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 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)	2022		2021	
As at December 31,	-50bp	+50bp	-50bp	+50bp
Net income attributed to shareholders ($ millions)(6)	**$ (100)**	**$ nil**	$ (600)	$ 500
MLI's LICAT ratio (change in percentage points)(7)	**(3)**	**3**	(3)	4

Swap spreads	2022		2021	
As at December 31,	-20bp	+20bp	-20bp	+20bp
Net income attributed to shareholders ($ millions)	**$ nil**	**$ nil**	$ nil	$ nil
MLI's LICAT ratio (change in percentage points)(7)	**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) The sensitivity on net income attributed to shareholders due to changes in corporate spreads decreased significantly as at December 31, 2022 compared with December 31, 2021, as the rise in risk-free interest rates reduced projected reinvestments in the actuarial valuation models.

(7) 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 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 region[1] based on current market inputs and the Company's balance sheet.

With the rise in interest rates in 2022, the probability of a scenario switch has decreased significantly. In a lower interest rate environment, we would estimate the incremental impact of a potential switch in the scenarios to be approximately a one-time six percentage point decrease in MLI's 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, infrastructure, and private equities, some of which relate to oil and gas.

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[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's LICAT ratio 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)	2022 -10%	2022 +10%	2021 -10%	2021 +10%
Net income attributed to shareholders				
Real estate, agriculture and timber assets	**$ (1,300)**	**$ 1,300**	$ (1,400)	$ 1,400
Private equities and other ALDA	**(1,600)**	**1,500**	(1,900)	1,800
Total(7)	**$ (2,900)**	**$ 2,800**	$ (3,300)	$ 3,200
MLI's LICAT ratio (change in percentage points)	**(3)**	**2**	(4)	3

(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.

(7) The decrease in net income sensitivity under each ALDA returns scenario was primarily driven by the increase in fixed income yields since December 31, 2021. This led to higher fixed income reinvestment rates relative to ALDA returns, which decreases the ALDA sensitivity because more fixed income assets are held compared to ALDA.

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, 2022, 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. Note that the impact of foreign currency exchange rates on items excluded from core earnings does not provide relevant information given the nature of these items.

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

As at December 31, ($ millions)	2022 +10% strengthening	2022 -10% weakening	2021 +10% strengthening	2021 -10% weakening
10% change in the Canadian dollar relative to the U.S. dollar and the Hong Kong dollar	**$ (350)**	**$ 350**	$ (400)	$ 400
10% change in the Canadian dollar relative to the Japanese yen	**(40)**	**40**	(40)	40

(1) This item is a non-GAAP financial measure. See "Non-GAAP and Other Financial Measures" below for more information.

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

LICAT regulatory 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 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 WAM has a standalone liquidity risk management framework for the businesses 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 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” below 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 assets, 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 low-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 diversified real estate investments. Our commercial real estate investments may be negatively impacted by the trends solidified by COVID-19, including the digitization of work and the transformation of physical retail. 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. Sustained declines in 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 proactively mitigate their impact through portfolio diversification and prudent operating practices.
- 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 long-leased real estate and certain infrastructure investments.
- The negative impact of changes in market or economic 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 endeavor to 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. Our real estate valuation is based on appraisals, and these appraisals may lag behind current market transactions.
- We rely on a diversified portfolio of ALDA 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 (nominal or real) 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 fund 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 macroeconomic 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 rate 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;
    - Lower interest rates could reduce the ability of MFC's insurance subsidiaries to pay dividends to MFC;
    - 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 could lead to customers surrendering policies and we may incur losses attributable to early liquidation of fixed income instruments supporting contractual surrender benefits.

The global interest rate benchmark reform, leading to the transition away from LIBOR / IBOR to alternative reference rates based on risk-free rates, may impact the value 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). As previously announced by the U.K. Financial Conduct Authority (FCA) in July 2017, the FCA will no longer compel panel banks to submit rate information used to determine LIBOR post 2021. On March 5, 2021, the Intercontinental Exchange Benchmark Administration, the administrator of LIBOR, announced that it will cease the publication of one-week and two-month USD LIBOR and all non-USD (GBP, EUR, CHF, and JPY) LIBOR settings at the end of December 2021, but will extend the publication of the remaining USD LIBOR tenors (overnight and one, three, six and 12 month USD LIBOR) until the end of June 2023. In addition, on June 22, 2021, OSFI published a letter setting out their expectation that Federally Regulated Financial Institutions (FRFIs) will stop using USD LIBOR as a reference rate as soon as possible and will not enter into transactions referencing these rates after December 31, 2021. On May 16, 2022, Refinitiv Benchmark Services (UK) Limited (RBSL), the administrator of Canadian Dollar Offered Rate (CDOR), announced that the calculation and publication of all tenors of CDOR will permanently cease immediately following a final publication on June 28, 2024. Further to the confirmation of CDOR's cessation date, OSFI expects all new derivative contracts and securities to transition to alternative reference rates by June 30, 2023, with no new CDOR exposure being booked after that date. The Canadian Overnight Repo Rate Average (CORRA) is the alternative reference rate to which CDOR is expected to transition.
- We successfully converted our exposures to LIBOR rates that decommissioned on December 31, 2021 and we continue to actively transition to the alternative reference rates such as the Secured Overnight Financing Rate (SOFR), the alternative rate for USD LIBOR, and the Singapore Overnight Rate Average (SORA), the alternative rate for the Singapore Swap Offer Rate (SOR). Changes from LIBOR / IBOR to alternative reference rates that have different characteristics compared to LIBOR / IBOR 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. For example, since SOFR is a secured overnight rate whereas LIBOR is an unsecured forward-looking rate for interbank funding over different maturities, there can be no assurance that SOFR will perform in the same way as LIBOR as a result of interest rate changes, market volatility, or global or regional economic, financial, political, regulatory, judicial, or other events. Furthermore, depending on the nature of the alternative reference rate, we may become exposed to additional risks such as legal settlement risk associated with instruments having inadequate fallback language.
- 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. Manulife's enterprise-wide program focuses on quantifying our exposures to various IBORs, evaluating contract fallback language, contract remediation, risk management, assessing accounting and tax implications, and ensuring operational readiness for IT systems, models, processes, and controls. We continue to monitor market developments, changes and guidance from regulators, and adjust our project plan to align with updated timelines.

Liquidity risk is impacted by various factors, including but not limited to, capital and credit market conditions, repricing 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, initial margin rules for new non-cleared derivatives, implemented since September 1, 2021, may further increase our liquidity needs over time.

- We are exposed to repricing 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 repricing 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, 2022, letters of credit for which third parties are beneficiaries, in the amount of $215 million, were outstanding. There were no assets pledged against these outstanding letters of credit as at December 31, 2022.
- 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, 2022, total pledged assets were $16,365 million, compared with $9,896 million as of December 31, 2021.
- Our bank subsidiary relies on confidence sensitive deposits.
    - Manulife Bank is a wholly owned subsidiary of our Canadian life insurance operating company, MLI. Retail deposits are a significant part of the funding base of Manulife Bank. 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, mitigation strategies in pursuant to the Bank's liquidity contingency plan will be executed and the Bank may have to sell assets to third parties. There is no guarantee that the Bank will sell the assets or that its customers will be able to repay their home equity line of credit. In such circumstances, Manulife Bank may seek to rely on Bank of Canada facilities to generate liquidity to pay depositors; however, these facilities are at the sole discretion of the Bank of Canada in which it provides only short-term liquidity and is not guaranteed.

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, 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 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 MFC. Although MFC has historically declared quarterly cash dividends on the common shares, MFC is not required to do so and the Board 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 15, 2023 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.

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. 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.

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 both bilateral and exchange-traded 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, 2022 was $3,714 million compared with $4,109 million as at December 31, 2021. This provision represents 1.4% of our fixed income assets[1] supporting policy liabilities reported on our Consolidated Statements of Financial Position as at December 31, 2022.

As at December 31, 2022 and December 31, 2021, 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 $75 million and $70 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-notch[2] 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 $250 million post-tax. This ratings downgrade would result in a one percentage point reduction to our LICAT ratio.

Approximately 25% of the impact from the one-notch ratings downgrade on our policy liabilities and net income attributed to shareholders noted above relates to fixed income assets rated below investment grade. Approximately 1% of our fixed income assets as of December 31, 2022 is rated below investment grade. 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)	**2022**	2021
Net impaired fixed income assets	**$ 313**	$ 228
Net impaired fixed income assets as a % of total invested assets	**0.075%**	0.053%
Allowance for loan losses	**$ 47**	$ 44

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[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+.

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 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 $313 million, representing 0.075% of total general fund invested assets as at December 31, 2022, compared with $228 million, representing 0.053% of total general fund invested assets as at December 31, 2021.

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, 2022, the largest single counterparty exposure, without taking into account the impact of master netting agreements or the benefit of collateral held, was $1,582 million (2021 – $2,132 million). The net exposure to this counterparty, after taking into account master netting agreements and the fair value of collateral held, was nil (2021 – nil). As at December 31, 2022, 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 $9,072 million (2021 – $18,226 million) compared with $215 million after taking into account master netting agreements and the benefit of fair value of collateral held (2021 – $294 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, 2022, the Company had loaned securities (which are included in invested assets) valued at approximately $723 million, compared with $564 million as at December 31, 2021.

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.

Product Risk Management Strategy

Product risk is governed by the Product Oversight Committee for the insurance business. Global WAM product risk is managed by first line product management working groups and the Global Investment Product Committee. Notable products which could introduce new and material risks are reviewed and approved by the Global WAM Risk Committee prior to launch.

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

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

Global WAM Risk Management Committee

Global WAM product risk is managed by first line product management working groups and the Global Investment Product Committee. The Global WAM Risk Management Committee reviews and approves notable new products prior to launch. The Global WAM Risk Management 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).
- 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. If premium persistency or lapse rates are significantly different from our expectations, it could have a material adverse effect on our business, financial condition, results of operations, and cash flows.

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 non-governmental 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. 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 COVID-19 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 product 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 15, 2023 and note 19 of the 2022 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 data backup facilities and/or failover capabilities as required to manage the risk of downtime and to accelerate system recovery when needed.

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 ongoing 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 associated with the handling of personal information, including 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. As a global company, Manulife is subject to a wide variety of laws and regulations throughout its operations, including those related to privacy and information security. In many jurisdictions, privacy and information security requirements are becoming more onerous, including stringent incident reporting requirements, and may increase our compliance costs as well as the risks associated with any compliance failure.

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, initiatives to help increase diversity, equity and inclusion, 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, GRM and Vendor Management policies), standards and procedures, and monitoring of ongoing results and contractual compliance of third-party arrangements.

Initiatives Risk Management Strategy

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

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, financial institutions, and wealth management organizations for industry-specific talent and against a broader range of companies in functional areas such as Finance, IT, HR, Legal and Operations, for qualified executives, employees and agents. We must attract and retain top talent to maintain our competitive advantage. The risk of other organizations outside of our geographic footprint targeting our employees is heightened with many companies now adopting flexible remote working arrangements. Additionally, we are in an environment where pay levels have been increasing more quickly than in recent years due to the competitive talent market, inflation and other factors. Therefore, we need to ensure we are paying competitively to both reduce key talent turnover risk, and successfully attract new talent to the company. We also need to ensure that we adapt our recruiting practices to draw on broader talent pools through the use of labour market intelligence and sourcing tools.

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 WAM 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 devote significant resources to develop our risk management policies, procedures, and strategies. Nonetheless, there is a risk that our policies, procedures, and strategies may not be comprehensive. Many of our methods for measuring and managing risk 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. 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, isolationist foreign policies, armed conflicts, civil unrest or disobedience, government policies or regulations adopted in response to political or social pressures and rising populism and/or nationalism, 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 and disruptions in global supply chains. In addition, as political tensions and populism and/or nationalism rise in a number of locations, compliance with laws and regulations by global financial institutions may become challenging as complying with the requirements in one jurisdiction may be contrary to the requirements of another.
- 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.
- In particular, tensions remain elevated between mainland China and Canada, the U.S. and their allies over a number of issues, including trade, technology and human rights resulting in the imposition of sanctions and trade restrictions on companies and individuals. Mainland China and the Hong Kong SAR are important markets for Manulife and escalating tensions may create a more challenging operating environment for Manulife. In addition, the military conflict in Ukraine and associated sanctions imposed on Russia and its allies has negatively impacted regional and global financial markets and economies.
- These risks could result in disruptions to our operations, unanticipated costs, increased market volatility and inflation, a contraction of business activity and recession, diminished investor and consumer confidence, lower investment growth, insurance sales and fees earned on managed assets, the loss of assets or a reduction in their value and reduced remittances. Failure to manage these risks could have a significant negative impact on our operations and profitability globally.

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 19 of the 2022 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. We rely on the internet in order to conduct business and may be adversely impacted by outages in critical infrastructure such as electric grids, undersea cables, satellites or other communications used by us or our third parties.
- 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 from COVID-19 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, 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 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 rely on highly complex models for pricing, valuation and risk measurement, and for input on 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.

- Fraud incidents could adversely impact our business, results of operations, financial condition and reputation. Policies and procedures are in place and seek to protect against ever-evolving fraud threats. However, we may nevertheless not be able to prevent and detect all fraud 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.

Damage to the natural environment may arise related to our business operations, owned property or commercial mortgage loan portfolio.

- 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, 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 contaminants 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 or 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.

Pandemic risk and potential implications of COVID-19

The COVID-19 pandemic continues to weigh on the global economy and it remains difficult to predict the significance of its longer-term impacts, particularly as COVID-19 becomes endemic in the markets in which we operate. Governments continue to navigate the implications from COVID-19 and changing circumstances may result in future legal, regulatory, tax, and other responses that could have a significant adverse impact on our global business operations and financial results.

- COVID-19 could continue to adversely impact our financial results as a result of reduced new business, including a reduction of activity through our distribution channels, reduced asset-based fee revenue, and net unfavourable policyholder experience including claims, lapse and premium persistency experience.
- As COVID-19 becomes endemic, there may be unexpected changes to the business and operating environment which may present new headwinds to our business strategy or new opportunities to pursue. The pace of recovery may continue to differ across geographies in which we operate, which could impact the execution of our business strategies. For example, a sustained zero-COVID policy in mainland China throughout 2022 has slowed sales growth in our Asia segment businesses due to border restrictions and immobility of our agents and employees. As mainland China shifts away from its zero-COVID policy, we would expect to experience a rebound in sales growth over time; however, the manner in which the government responds to future outbreaks may further delay our ability to drive sales growth in the region. The sudden easing of restrictions could put significant strain on mainland China's public health system, which could increase mortality and morbidity claims. This could increase volatility in our financial results or materially reduce our profitability.
- 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. Reinsurers may also dispute, or seek to reduce, or eliminate coverage on policies as a result of any COVID-19 related changes to policies or practices we make.
- In pricing or repricing of new business, the impact of any COVID-19 related changes may be compounded with or offset by other pricing inputs. These inputs include assumption changes (e.g., reinsurance, interest rates, morbidity, mortality, expense, and lapse and surrender changes), business considerations related to retaining specific market share or client business and regulatory restrictions impacting the approval process for price changes.
- The potential longer-term impacts of the pandemic may include latent morbidity impacts from the deferral of medical treatment by policyholders. It may be a factor in increasing morbidity claims and there may be implications from other factors such as long-term post COVID-19 symptoms.
- Previously imposed COVID-19 related restrictions have been gradually lifting in markets in which we operate but have also been introduced or reimposed in a limited number of other markets. In the jurisdictions where the restrictions have been lifted, the majority of our employees have returned to office on a hybrid work arrangement. The implementation of widespread remote work arrangements has also increased 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.
- The global recessionary environment could continue to put downward pressure on asset valuations and increase the risk of potential impairments of investments, particularly for more exposed sectors such as transportation, services, and consumer cyclical industries. Furthermore, reduced demand for office space as a result of widespread full-time remote or hybrid work arrangements could continue to have a negative impact on our commercial real estate portfolio.
- Borrowers 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.
- Extreme market volatility and stressed conditions resulting from possible longer-term impacts of 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. Sustained global economic uncertainty could also result in adverse credit ratings changes which in turn could result in more costly or limited access to funding sources. 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.

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 January 2023, a revised LICAT guideline, aligning with the IFRS 17 accounting changes, took effect. This will be followed by an update to the capital rules for Segregated Fund Guarantees, expected to be effective in January 2025.

At its annual meeting in November 2019, the IAIS adopted a risk based global ICS, that is being 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, adopted by the IAIS in November 2019, 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 have been made to ICS since the beginning of the five-year monitoring period. We will continue to monitor developments as the ICS methodology and its applicability evolve.

In December 2022, the Financial Stability Board (FSB) adopted the IAIS Holistic Framework for the assessment and mitigation of systemic risk and discontinued the annual identification of Global Systemically Important Insurers (G-SIIs). Manulife was supportive of this direction.

Regulators in various jurisdictions in which we operate have embarked on reforming their respective capital regulations. While the ultimate impact of these changes remains uncertain, we closely monitor the developments.

IFRS 17 and IFRS 9

IFRS 17 "Insurance Contracts" and IFRS 9 "Financial Instruments" are effective for insurance companies in 2023.

IFRS 17 replaced IFRS 4 "Insurance Contracts" and will materially change the timing of the recognition of earnings from our insurance business and therefore, our shareholders' equity. Furthermore, the requirements of the new standard are complex and have necessitated significant enhancements to finance infrastructure and processes and could impact our business strategy. IFRS 9 will impact the measurement and timing of investment income.

A summary of some of the key differences between IFRS 17 and IFRS 4 is outlined in the "Future Accounting and Reporting Changes" section below. The impacts of IFRS 17 are expected to include[1]:

- The establishment of a CSM on our in-force business, which represents unearned profits, was expected to decrease equity upon transition. The LICAT guideline for 2023 issued on July 21, 2022 makes calibration adjustments relating to the inclusion of CSM in available capital and the reduction of the scalar on base solvency buffer. In addition, the LICAT ratio is expected to be less sensitive to changes in interest rates and more stable under IFRS 17 compared with IFRS 4. Given this greater stability, the impact of IFRS 17 upon adoption on January 1, 2023 is expected to be a low single-digit percentage point increase to the LICAT ratio based on markets as of December 31, 2022. We expect our capital position will continue to be strong under IFRS 17.
- The deferral of the recognition of new business gains via the CSM, and to a substantially lesser extent, the timing of investments results, will shift earnings out into future periods. As a result, on transition, net income and core earnings in 2022 are expected to be lower under IFRS 17 compared with IFRS 4. This impact will be partially offset by the amortization into income of the CSM that will be established on our in-force business. Overall, considering these items along with the various other impacts, on transition we expect 2022 core earnings to decline by approximately 5% to 10% under IFRS 17 compared with IFRS 4. A transition impact on our net income attributed to shareholders is difficult to predict as it is also impacted by prevailing market conditions. In addition, we expect IFRS 17 to improve the stability of both our core earnings and net income attributed to shareholders.

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

- Core earnings will remain a key performance metric and the definition will be adapted to align with IFRS 17. Under the revised definition, core earnings will exclude items such as the direct impact of markets and interest rates, including investment experience from ALDA, realized gains and losses on fixed income assets, hedge ineffectiveness, and changes in methods and assumptions recorded directly in profit or loss. We believe that the revised core earnings definition represents our operating performance and the long-term earnings capacity of the business.
- The treatment of new business gains under IFRS 17 is materially different from IFRS 4. The CSM is an intrinsic part of the value of an insurance business and is a measure of growth and future earnings generation capability. This highlights the importance of the CSM as a GAAP performance measure and as such, upon adoption, we will be adding two new medium-term targets:
    i. 15% growth per year for new business CSM, and
    ii. 8% to 10% growth per year in the CSM balance.

In 1Q22, we confirmed our medium-term financial and operating targets under IFRS 17, and upon adoption, will adjust certain targets as follows[1]:

- Core ROE will be increased to 15%+ (from 13%+ currently) due to the expected changes to core earnings and equity,
- Common share core dividend payout ratio[2] will be increased to 35% to 45% (from 30% to 40% currently) due to the expected changes to core earnings, and
- Leverage ratio definition will be adjusted to include the CSM in the denominator given that the CSM represents unearned profit and available capital under LICAT.

We reported $246 million (post-tax) from the impact of new business[3], which is included in core earnings and net income attributed to shareholders in 4Q22 (4Q21 – $295 million). On a year-to-date basis, the impact of new business was $879 million (post-tax) in 2022 (2021 – $1,115 million).

Risks related to the new standards include:

- **The impact on our business strategy as a result of temporary volatility.** The Company's capital position and income for accounting purposes could be influenced by prevailing market conditions, resulting in volatility of reported results, which may require changes to business strategies. 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 of accounting mismatches from derivatives used for economic hedging purposes.** Under CALM, both changes in insurance contract liabilities and changes in the fair value of derivatives used to economically hedge these liabilities are recognized in income, which results in a natural offset in net income. Under IFRS 17, we will elect the option to record changes in insurance contract liabilities arising from changes in interest rates through other comprehensive income (the "OCI option"). In certain circumstances, some derivatives that are used for economic hedging purposes do not qualify for hedge accounting under IFRS 9, and therefore the election of the OCI option could result in a mismatch in accounting net income, as changes in the fair value of these derivatives would be recorded in net income, while the impact of changes in discount rates on insurance contract liabilities would be recorded in other comprehensive income. In addition, if derivatives used for economic hedging purposes qualify for hedge accounting, IFRS 9 requires that the difference, if any, between the impact of changes in discount rates on the hedged portion of insurance contract liabilities and the change in the fair value of the hedging derivatives be reported in net income as hedge ineffectiveness.
- **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 of inconsistencies in timing of adoption among various jurisdictions.** As a global insurer with subsidiaries in Asia and other jurisdictions, regional differences in effective dates will require us to maintain more than one set of financial records to support both consolidated financial statements and for local subsidiary reporting requirements.

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; including interest rates policy from central banks; 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 or natural disaster 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.

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

[2] This item is a non-GAAP ratio. See "Non-GAAP and other financial measures" below for more information.

[3] The impact of new business represents the financial impact of all new business written in the period, including acquisition expenses.

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 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") typically quantifies the financial impact of economic events arising from shocks in public equity and other markets, interest rates and credit, amongst others. Our 2022 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 ORSA process, which ties together our risk management, strategic planning and capital management practices to confirm that our capital levels continue to be adequate from an economic perspective.

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

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

Financing Activities

Securities Transactions

During 2022, we raised a total of $2.0 billion of debt and other equity (limited recourse capital notes) instruments in Canada and the U.S., and $1.7 billion of securities were redeemed at par.

($ millions)		Par value	Issued(1)	Redeemed/ Matured(1)
3.703% MFC US Senior notes, issued on Mar 16, 2022	US$	750	1,010	–
7.117% MFC Limited recourse capital notes Series 3, issued on Jun 16, 2022	$	1,000	991	–
4.85% MFC Class 1 preferred shares Series 23, redeemed on Mar 19, 2022	$	475	–	467
4.312% MFC Class 1 preferred shares Series 9, redeemed on Mar 19, 2022	$	250	–	244
3.181% MLI Subordinated debentures, redeemed on Nov 22, 2022	$	1,000	–	1,000
Total			**$ 2,001**	**$ 1,711**

(1) Represents carrying value, net of issuance costs.

Normal Course Issuer Bid

We announced on February 15, 2023, subject to the approval of the Toronto Stock Exchange ("TSX"), our intention to launch a normal course issuer bid ("NCIB") permitting the purchase for cancellation of up to 55.7 million common shares, representing approximately 3% of our issued and outstanding common shares. Purchases under the NCIB may commence after the TSX has accepted the notice of intention and continue for up to one year, or such earlier date as we complete our purchases.[1]

Our previous NCIB that was announced on February 1, 2022 expired on February 2, 2023. Under this NCIB, MFC purchased for cancellation 85.8 million of its common shares at an average price of $23.99 per share for a total cost of $2.1 billion, which represent 4.4% of our issued and outstanding common shares.

During 2022, MFC purchased and subsequently cancelled 78.9 million of its common shares at an average price of $23.87 per common share for a total cost of $1.9 billion.

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

Consolidated Capital

As at December 31, ($ millions)	**2022**	2021
Non-controlling interests	**$ 1,664**	$ 1,694
Participating policyholders' equity	**(1,346)**	(1,233)
Preferred shares and other equity	**6,660**	6,381
Common shareholders' equity(1)	**49,401**	52,027
Total equity	**56,379**	58,869
Exclude the accumulated other comprehensive gain/(loss) on cash flow hedges	**8**	(156)
Total equity excluding accumulated other comprehensive gain/(loss) on cash flow hedges	**56,371**	59,025
Qualifying capital instruments	**6,122**	6,980
Consolidated capital(2)	**$ 62,493**	$ 66,005

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

(2) Consolidated capital does not include $6.2 billion (2021 – $4.9 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.

MFC's consolidated capital was $62.5 billion as at December 31, 2022, compared with $66.0 billion as at December 31, 2021, a decrease of $3.5 billion. The decrease was driven by a decline in total equity and the redemption of capital instruments. The decline in total equity was due to a reduction in the carrying value of AFS debt securities from higher interest rates, and common share buybacks, partially offset by growth in retained earnings, the impact of a weaker Canadian dollar, and net capital issuance.

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. Remittances is defined as the cash remitted or made available for distribution to the Manulife 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 2022, MFC subsidiaries delivered $6.9 billion in remittances of which Asia and U.S. operations[1,2] have delivered $0.9 billion and $2.8 billion, respectively. Remittances in 2022 increased by $2.5 billion compared with 2021 primarily due to the benefits from the reinsurance of U.S. variable annuities and other corporate actions.

Financial Leverage Ratio

MFC's financial leverage ratio as at December 31, 2022 was 27.7%, an increase of 1.9 percentage points from 25.8% as at December 31, 2021. The increase in the ratio was driven by a reduction in the carrying value of AFS debt securities from higher interest rates, common share buybacks, and the net issuance of securities[3], partially offset by growth in retained earnings and the impact of a weaker Canadian dollar.

Common Shareholder Dividends

The declaration and payment of shareholder dividends and the amount thereof are at the discretion of the Board and depend upon various factors, including the results of operations, financial conditions, future prospects of the Company, dividend payout ratio and taking into account regulatory restrictions on the payment of shareholder dividends.

Common Shareholder Dividends Paid

For the years ended December 31, $ per share	**2022**	2021
Dividends paid	**$ 1.32**	$ 1.17

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's discretion.

During 2022, the required common shares in connection with the DRIP were purchased on the open market with no applicable discount.

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[1] Remittances from Asia and U.S. operations include the remittances from their respective affiliate reinsurers. In addition, U.S. operation remittances include the International High Net Worth business written in the Bermuda branch of MLI.

[2] Asia and U.S. operations include their respective insurance, and wealth and asset management segments.

[3] For financial leverage ratio, net issuance of securities consisted of the issuance of Limited Recourse Capital Notes (reported as other equity instruments) of $1.0 billion and senior debt of $1.0 billion, offset by the redemption of subordinated debt of $1.0 billion, and two series of preferred shares totaling $0.7 billion.

Regulatory Capital Position[1]

MFC and MLI are regulated by OSFI and are subject to consolidated risk based capital requirements. Manulife monitors and manages its consolidated capital in compliance with the 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 reporting purposes under the LICAT framework, consolidated capital is adjusted for various additions or deductions to capital as mandated by the guidelines defined by OSFI.

Manulife's operating activities are conducted within MLI and its subsidiaries. MLI's LICAT ratio was 131% as at December 31, 2022, compared with 142% as at December 31, 2021. The eleven percentage point decrease from December 31, 2021 was driven by the unfavourable impact of market movements on capital primarily from the large increase in risk-free interest rates, and from common share buybacks, partly offset by favourable impacts from the U.S. variable annuity reinsurance transactions.

MFC's LICAT ratio was 119% as at December 31, 2022, compared with 132% as at December 31, 2021, with the decrease driven by similar factors that impacted the movement in MLI's LICAT ratio, except for the issuance of MFC senior debt which got reflected in MLI's LICAT ratio but not MFC's. The difference between the MLI and MFC ratios is largely due to the $6.2 billion (2021 – $4.9 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 ratios as at December 31, 2022, resulted in excess capital of $20.3 billion over OSFI's supervisory target ratio of 100% for MLI, and $19.1 billion over OSFI's regulatory minimum target ratio of 90% for MFC (no supervisory target is applicable to MFC). In addition, all MLI's subsidiaries maintain 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 2022, S&P, Moody's, DBRS Morningstar, Fitch and AM Best Company ("AM Best") maintained their assigned ratings of MFC and its primary insurance operating companies.

The following table summarizes the financial strength ratings of MLI and certain of its subsidiaries as at January 31, 2023.

Financial Strength Ratings

Subsidiary	Jurisdiction	S&P	Moody's	DBRS Morningstar	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, 2023, S&P, Moody's, DBRS Morningstar, Fitch, and AM Best had a stable outlook on these ratings. The S&P rating and related outlook for Manulife Life Insurance Company are constrained by the sovereign rating on Japan (A+/Stable).

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

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 2022 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 ASB. 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 2022 experience was unfavourable (2021 – 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 2022 experience was favourable (2021 – favourable) 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 2022 experience was unfavourable (2021 – 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 2022 were unfavourable (2021 – unfavourable) when compared with our assumptions. Taxes reflect assumptions for future premium taxes and other non-income related taxes. For income taxes, policy liabilities are adjusted only for temporary tax timing and permanent tax rate differences on the cash flows available to satisfy policy obligations.

Investment Returns

As noted in the “Risk Management and Risk Factors – 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 and 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 2022, actual investment returns were favourable (2021 – favourable) when compared with our assumptions. Investment-related experience and the direct impact of interest rates and equity markets are discussed in the “Manulife Financial Corporation – Profitability” section above.

Segregated Funds

We offer segregated funds to policyholders that offer certain guarantees, including guaranteed returns of principal on maturity or death, as well as guarantees of minimum withdrawal amounts or income benefits. The on-balance sheet liability for these benefits is the expected cost of these guarantees including appropriate valuation margins for the various contingencies including mortality and lapse. The dominant driver of the cost of guarantees is the return on the underlying funds in which the policyholders invest. See “Risk Management and Risk Factors – Market Risk – Hedging Strategies for Variable Annuity and Other Equity Risks” and the “Manulife Financial Corporation – Profitability” 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)	**2022**	2021
Best estimate actuarial liability	**$ 255,871**	$ 275,552
Provision for adverse deviation ("PfAD")		
Insurance risks (mortality/morbidity)	**$ 16,068**	$ 18,888
Policyholder behaviour (lapse/surrender/premium persistency)	**5,665**	6,541
Expenses	**1,665**	1,834
Investment risks (non-credit)	**33,865**	34,396
Investment risks (credit)	**937**	1,020
Segregated funds guarantees	**720**	1,679
Total PfAD(1)	**58,920**	64,358
Segregated funds—additional margins	**11,656**	17,099
Total of PfAD and additional segregated fund margins	**$ 70,576**	$ 81,457

(1) Reported net actuarial liabilities (excluding the $4,527 million (2021 – $4,474 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, 2022 of $314,791 million (2021 – $339,910 million) are comprised of $255,871 million (2021 – $275,552 million) of best estimate actuarial liabilities and $58,920 million (2021 – $64,358 million) of PfAD.

The change in the PfAD from period to period is impacted by changes in liability and asset composition, by currency and interest rate movements and by material changes in valuation assumptions. The overall decrease in PfADs for insurance risks was primarily due to the impact of higher interest rates in the U.S., Canada and Asia, the annual review of actuarial methods and assumptions, partially offset by the depreciation of the Canadian dollar relative to the U.S. dollar and other major currencies, as well as the expected PfAD growth from in-force and new business. The overall decrease in PfADs for policyholder behaviour and expenses was driven by the impact of higher interest rates in the U.S., Canada and Asia, partially offset by the depreciation of the Canadian dollar and the expected PfAD growth from in-force and new business. The overall decrease in PfADs for non-credit investment risks was driven by the impact of higher interest rates in the U.S., Canada and Asia, as well as the annual review of actuarial methods and assumptions, partially offset by the expected PfAD growth from in-force and new business and the depreciation of the Canadian dollar. The decrease in the additional segregated fund margins was primarily due to the reduced exposure driven by the Venerable reinsurance transaction, as well as the increase in interest rates in the U.S. and Canada.

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, 2022 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 **2022**	 2021
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	**(500)**	(500)
5% adverse change in future morbidity rates (incidence and termination)[3],[4],[5]	**(4,500)**	(5,500)
10% adverse change in future policy termination rates[4]	**(2,200)**	(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 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 **2022**	 2021
Policy related assumptions		
2% adverse change in future mortality rates[2],[3]	**$ (300)**	$ (300)
5% adverse change in future morbidity incidence rates[2],[3]	**(1,700)**	(2,000)
5% adverse change in future morbidity claims termination rates[2],[3]	**(2,400)**	(3,100)
10% adverse change in future policy termination rates[2],[3]	**(300)**	(400)
5% increase in future expense levels[3]	**(100)**	(100)

[1] Translated from US$ at 1.3549 for 2022.

[2] The impacts of the sensitivities on LTC for morbidity, mortality and lapse do not assume any 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. The decrease in sensitivity to both future incidence and claims terminations rates is due to the impact of higher interest rates and updated assumptions as part of the 2022 Review of Actuarial Methods and Assumptions.

[3] The impact of favourable changes to all the sensitivities is relatively symmetrical.

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

	Increase (decrease) in after-tax net income attributed to shareholders			
As at December 31,	**2022**		2021	
($ millions)	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]	**$ 400**	**$ (400)**	$ 500	$ (500)
100 basis point change in future annual returns for ALDA[2]	**3,300**	**(3,600)**	3,900	(4,700)
100 basis point change in equity volatility assumption for stochastic segregated fund modelling[3]	**(100)**	**100**	(200)	200

[1] The sensitivity to public equity returns above includes the impact on both segregated fund guarantee reserves and on other policy liabilities. Expected long-term annual market growth assumptions for public equities are based on long-term historical observed experience and compliance with actuarial standards. As at December 31, 2022, the growth rates inclusive of dividends in the major markets used in the stochastic valuation models for valuing segregated fund guarantees are 9.0% (9.0% as at December 31, 2021) per annum in Canada, 9.6% (9.6% as at December 31, 2021) per annum in the U.S. and 6.2% (6.2% as at December 31, 2021) 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, infrastructure 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 11.5% (5.25% and 11.5% as at December 31, 2021), with an average of 9.2% (9.2% as at December 31, 2021) based on the current asset mix backing our guaranteed insurance and annuity business as of December 31, 2022. 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 6.0% (6.0% as at December 31, 2021) based on the asset mix backing our guaranteed insurance and annuity business as of December 31, 2022.

[3] Volatility assumptions for public equities are based on long-term historical observed experience and compliance with actuarial standards. As of December 31, 2022 and December 31, 2021, unless otherwise stated, the resulting volatility assumptions are 16.5% per annum in Canada, 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.

2022 Review of Actuarial Methods and Assumptions

The completion of the 2022 annual review of actuarial methods and assumptions resulted in a decrease in insurance contract liabilities, net of reinsurance, of $80 million, and a net gain to net income attributed to shareholders of $36 million post-tax.

	Change in insurance contract liabilities, net of reinsurance			
For the year ended December 31, 2022 ($ millions)	Total	Attributed to participating policyholders' account(1)	Attributed to shareholders' account	Change in net income attributed to shareholders (post-tax)
Long-term care triennial review	$ **19**	$ **–**	$ **19**	$ **(15)**
Mortality and morbidity updates	**157**	**(5)**	**162**	**(126)**
Lapses and policyholder behaviour updates	**317**	**74**	**243**	**(192)**
Investment-related updates	**(210)**	**(1)**	**(209)**	**157**
Other updates	**(363)**	**(145)**	**(218)**	**212**
Net impact	$ **(80)**	$ **(77)**	$ **(3)**	$ **36**

(1) The change in insurance contract liabilities, net of reinsurance, attributable to the participating policyholders' account was primarily driven by an increase in expected long-term interest rates within the valuation models to reflect the higher interest rate environment, partially offset by the lapse assumption update in Canada.

Long-term care triennial review

U.S. Insurance completed a comprehensive long-term care ("LTC") experience study. The review included all aspects of claim assumptions, as well as the progress on future premium rate increases. The impact of the LTC review resulted in a net $15 million post-tax charge to net income attributed to shareholders.

The experience study showed that claim costs established in our last triennial review remain appropriate in aggregate for our older blocks of business[1] supported by robust claims data on this mature block. Insurance contract liabilities were strengthened for claim costs on our newer block of business[2]. This was driven by lower active life mortality[3] supported by Company experience and a recent industry study, as well as higher utilization of benefits, which included the impact of reflecting higher inflation in the cost-of-care up to the current year. We also reviewed and updated incidence and claim termination assumptions which, on a net basis, provided a partial offset to the increase in insurance contract liabilities on active life mortality and utilization. In addition, some policyholders are electing to reduce their benefits in lieu of paying increased premiums which resulted in a reduction in insurance contract liabilities. The overall claims experience review led to a post-tax charge to net income attributed to shareholders of approximately $2.3 billion (US$1.7 billion).

Experience continues to support the assumptions of both future morbidity and mortality improvement, resulting in no changes to these assumptions.

As of September 30, 2022, we have received actual premium increase approvals of $2.5 billion pre-tax (US$1.9 billion pre-tax) on a present value basis since the last triennial review in 2019. This aligns with the full amount assumed in our insurance contract liabilities at that time and demonstrates our continued strong track record of progress in securing premium rate increases.[4] In 2022, the review of future premium increases assumed in insurance contract liabilities resulted in a post-tax gain to net income attributed to shareholders of approximately $2.1 billion (US$1.6 billion), in comparison to a total estimated ask of $6.7 billion (US$5.1 billion). This reflects expected future premium increases that are due to our 2022 review of morbidity, mortality, and lapse assumptions, as well as outstanding amounts from prior state filings. Premium increases averaging approximately 30% will be sought on about one-half of the business, excluding the carryover of 2019 amounts requested. Our assumptions reflect the estimated timing and amount of state approved premium increases.

Other refinements to LTC valuation resulted in a post-tax gain of approximately $0.2 billion (US$0.2 billion) to net income attributed to shareholders.

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[1] First generation policies issued prior to 2002.

[2] Second generation policies with an average issue date of 2007 and Group policies with an average issue date of 2003.

[3] The mortality rate of LTC policyholders who are currently not on claim.

[4] Our actual experience obtaining premium increases could be materially different than what we have assumed, resulting in further increases or decreases in insurance contract liabilities, which could be material. See "Caution regarding forward-looking statements" above.

Mortality and morbidity updates

Mortality and morbidity updates resulted in a $126 million post-tax charge to net income attributed to shareholders, driven by a detailed review of the mortality and morbidity assumptions for our Canada insurance business, and by updates to morbidity assumptions in Vietnam to align with experience.

Lapses and policyholder behaviour updates

Updates to lapses and policyholder behaviour assumptions resulted in a $192 million post-tax charge to net income attributed to shareholders.

We completed a detailed review of lapse assumptions for Singapore, and increased lapse rates to align with experience on our index-linked products, which reduced projected future fee income to be received on these products.

We also increased lapse rates on Canada's term insurance products for policies approaching their renewal date, reflecting emerging experience in our study.

Investment-related updates

Updates to investment return assumptions resulted in a $157 million post-tax gain to net income attributed to shareholders, primarily driven by annual updates to our valuation models to reflect market movements during the year. No changes were made to our long-term assumed returns.

Other updates

Other updates resulted in a $212 million post-tax gain to net income attributed to shareholders, which included refinements to the projection of our tax and liability cash flows, as well as various other modelling updates.

Impact of changes in actuarial methods and assumptions by segment

The impact of changes in actuarial methods and assumptions in Canada resulted in a $35 million post-tax gain to net income attributed to shareholders. The gain was primarily driven by refinements to our valuation models, due to annual updates to reflect market movements during the year, partially offset by updates of mortality and morbidity assumptions for our insurance business and lapse assumptions for certain term insurance products.

The impact of changes in actuarial methods and assumptions in the U.S. resulted in a $36 million post-tax gain, driven by refinements to our valuation models, due to annual updates to reflect market movements during the year. The triennial review of long-term care was net neutral overall.

The impact of changes in actuarial methods and assumptions in Asia resulted in a $45 million post-tax charge to net income attributed to shareholders. The charge was primarily driven by updates to lapse assumptions in Singapore and morbidity updates in Vietnam, partially offset by refinements to the projection of tax and liability cash flows in Vietnam.

The impact of changes in actuarial methods and assumptions in Corporate and Other (which includes our Reinsurance businesses) resulted in a $10 million post-tax gain to net income attributed to shareholders.

2021 Review of Actuarial Methods and Assumptions

The 2021 full year review of actuarial methods and assumptions did not reflect COVID-19 experience as it is too soon to assess the impact of COVID-19 on long-term assumptions. Experience related to COVID-19 will continue to be closely monitored, as well as emerging research on the long-term implications of COVID-19 on mortality and other assumptions.

The completion of the 2021 annual review of actuarial methods and assumptions resulted in an increase in insurance contract liabilities of $287 million, net of reinsurance, and a decrease in net income attributed to shareholders of $41 million post-tax.

	Change in insurance contract liabilities, net of reinsurance			
For the year ended December 31, 2021 ($ millions)	Total	Attributed to participating policyholders' account[1]	Attributed to shareholders' account	Change in net income attributed to shareholders (post-tax)
U.S. variable annuity product review	$ 51	$ –	$ 51	$ (40)
Mortality and morbidity updates	350	–	350	(257)
Lapses and policyholder behaviour updates	686	18	668	(534)
Expense updates	(653)	(25)	(628)	503
Investment-related updates	(257)	(2)	(255)	168
Other updates	110	231	(121)	119
Net impact	$ 287	$ 222	$ 65	$ (41)

[1] The change in insurance contract liabilities, net of reinsurance, attributable to the participating policyholders' account was primarily driven by a reduction in the expected long-term interest rates within the valuation models to reflect the low interest rate environment.

U.S. variable annuity product review

The review of our variable annuity products in the U.S. resulted in a $40 million post-tax charge to net income attributed to shareholders.

The charge was primarily driven by updates to lapse assumptions to reflect emerging experience, partially offset by refinements to our segregated fund guaranteed minimum withdrawal benefit valuation models.

Updates to mortality and morbidity

Mortality and morbidity updates resulted in a $257 million post-tax charge to net income attributed to shareholders.

The charge was driven by updates to older age mortality on certain products in our U.S. life insurance business, mortality assumption updates in Indonesia to reflect recent experience, as well as from refining assumptions on several reinsurance arrangements in Canada.

Updates to lapses and policyholder behaviour

Updates to lapses and policyholder behaviour assumptions resulted in a $534 million post-tax charge to net income attributed to shareholders.

We completed a detailed review of lapse assumptions for non-participating policies within our U.S. life insurance business including those for universal life, variable universal life, and term products. We observed a trend of low lapse rates on our protection-focused universal life insurance products as consumers continue to value the product guarantees in the prolonged low interest rate environment. We lowered the overall lapse assumptions for these products to reflect actual experience, which resulted in a post-tax charge to net income attributed to shareholders.

Other updates to lapse and policyholder behaviour assumptions were made across several products in Canada and Japan to reflect recent experience, resulting in a modest post-tax charge to net income attributed to shareholders.

Expense updates

Updates to expense assumptions resulted in a $503 million post-tax gain to net income attributed to shareholders.

We completed a detailed review of our investment expense assumptions across the Company. This resulted in a $263 million post-tax gain to net income attributed to shareholders, primarily driven by scale benefits.

We also completed a global expense study, which resulted in a $256 million post-tax gain to net income attributed to shareholders. The favourable result primarily reflects a reallocation of expenses across certain business lines to align with actual experience, as well as from expense savings related to various expense efficiency initiatives.

Investment-related updates

Updates to investment return assumptions resulted in a $168 million post-tax gain to net income attributed to shareholders.

The primary driver of the gain was an update to our corporate bond default rates to reflect recent experience; we reduced default assumptions for certain credit ratings in Canada, the U.S., and Japan. This was partially offset by a reduction to our Canadian real estate investment return assumptions.

Other updates

Other updates resulted in a $119 million post-tax gain to net income attributed to shareholders.

This was primarily driven by Japan, whereby investment fees for certain mandates in the general fund provided by affiliate investment managers were reviewed and updated to align with broader market levels.

Impact of changes in actuarial methods and assumptions by segment

The impact of changes in actuarial methods and assumptions in Canada resulted in a $65 million post-tax charge to net income attributed to shareholders. The charge was primarily driven by a reduction to our real estate investment return assumptions, as well as from refining assumptions on several reinsurance arrangements in individual insurance, largely offset by positive updates related to our company-wide expense review and corporate bond default study.

The impact of changes in actuarial methods and assumptions in the U.S. resulted in a $314 million post-tax charge to net income attributed to shareholders. The charge was primarily driven by updates to lapse and mortality assumptions in our U.S. life insurance business to reflect emerging experience, partially offset by positive updates related to our company-wide expense review and corporate bond default study.

The impact of changes in actuarial methods and assumptions in Asia resulted in a $343 million post-tax gain to net income attributed to shareholders. The gain was primarily driven by Japan, whereby investment fees for certain mandates in the general fund provided by affiliate investment managers were reviewed and updated to align with broader market levels, as well as from the positive updates related to our corporate bond default study. This was partially offset by updates to the mortality assumptions in Indonesia to reflect recent experience.

The impact of changes in actuarial methods and assumptions in Corporate and Other (which includes our Reinsurance business) resulted in a $5 million post-tax charge to net income attributed to shareholders.

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:

2022 Net Insurance Contract Liability Movement Analysis

For the year ended December 31, 2022 ($ millions)	Asia	Canada	U.S.	Corporate and Other	Total
Balance, January 1	**$ 111,432**	**$ 89,373**	**$ 147,230**	**$ (291)**	**$ 347,744**
New business(1),(2)	**5,224**	**(306)**	**447**	**–**	**5,365**
In-force movement(1),(3)	**(8,222)**	**(10,353)**	**(19,667)**	**284**	**(37,958)**
Changes in methods and assumptions(1)	**50**	**(71)**	**(46)**	**(13)**	**(80)**
Reinsurance transactions(1),(4)	**–**	**–**	**(2,419)**	**–**	**(2,419)**
Currency impact(5)	**2,857**	**7**	**8,233**	**(18)**	**11,079**
Balance, December 31	**$ 111,341**	**$ 78,650**	**$ 133,778**	**$ (38)**	**$ 323,731**

(1) The $35,644 million decrease reported as the change in insurance contract liabilities and change in reinsurance assets on the 2022 Consolidated Statements of Income primarily consists of changes due to normal in-force movement, new policies, changes in methods and assumptions, and reinsurance transactions. The net impact of these items results in a decrease of $35,092 million, of which $36,116 million is included in the Consolidated Statements of Income as a decrease in insurance contract liabilities and change in reinsurance assets, with the remaining $1,024 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 a decrease of $37,958 million, primarily reflecting the impact of interest rate increases in the U.S., Canada and Asia and expected growth in insurance contract liabilities in all three geographic segments.

(4) In 2022, we completed two transactions to reinsure blocks of legacy U.S. variable annuity ("VA") policies. Under the terms of the transactions, the Company will retain responsibility for the maintenance of the policies with no intended impact to VA policyholders. The transactions were structured as coinsurance for the general fund liabilities and modified coinsurance for the segregated fund liabilities.

(5) The increase in policy liabilities from currency impact reflects the depreciation of the Canadian dollar relative to the U.S. dollar, Hong Kong dollar and Singapore dollar, slightly offset by the appreciation of the Canadian dollar relative to the 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.

2021 Net Insurance Contract Liability Movement Analysis

For the year ended December 31, 2021 ($ millions)	Asia	Canada	U.S.	Corporate and Other	Total
Balance, January 1	$ 102,958	$ 90,346	$ 146,939	$ (458)	$ 339,785
New business(1),(2)	5,748	(211)	410	–	5,947
In-force movement(1),(3)	6,402	(939)	348	161	5,972
Changes in methods and assumptions(1)	(335)	177	439	6	287
Reinsurance transactions(1)	–	–	–	–	–
Currency impact(4)	(3,341)	–	(906)	–	(4,247)
Balance, December 31	$ 111,432	$ 89,373	$ 147,230	$ (291)	$ 347,744

(1) The $11,473 million increase reported as the change in insurance contract liabilities and change in reinsurance assets on the 2021 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 resulted in an increase of $12,206 million, of which $10,923 million is included in the Consolidated Statements of Income as an increase in insurance contract liabilities and change in reinsurance assets, with the remaining $1,283 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 $5,972 million, primarily reflecting the expected growth in insurance contract liabilities in all three geographic segments, partially offset by the impact of interest rate increases.

(4) The decrease in policy liabilities from currency impact reflects the appreciation of the Canadian dollar relative to the Japanese yen and U.S. dollar. 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.

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;
- The extent of other parties' involvement in the entity, if any, the possibility for de facto control being present; 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 or loses power over the financial and operating policies of the entity;
- 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. A change in control may lead to gains or losses on derecognition of a subsidiary when losing control, or on derecognition of previous interests in a subsidiary when gaining control.

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 2022 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 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 debt 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 debt 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 2022 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 5 to the 2022 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 previous periods. Assessments of hedge effectiveness and measurements of ineffectiveness of hedging relationships are also subject to interpretations and estimations. If it were determined that hedge accounting designations were not appropriately applied, reported net income attributed to shareholders could be materially affected.

Employee Future Benefits

The Company maintains defined contribution and defined benefit pension plans and other post-employment plans for employees and agents, including registered (tax qualified) pension plans that are typically funded, as well as supplemental non-registered (non-qualified) pension plans for executives, retiree welfare plans and disability welfare plans that are typically not funded. The largest defined benefit pension and retiree welfare plans in the U.S. and Canada are the material plans that are discussed herein and in note 16 to the 2022 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 16 to the 2022 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 2022, the amount recorded in OCI was a loss of $49 million (2021 – gain of $217 million) for the defined benefit pension plans and a gain of $34 million (2021 – gain of $27 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 2022, the Company contributed $3 million (2021 – $2 million) to these plans. As at December 31, 2022, the difference between the fair value of assets and the defined benefit obligation for these plans was a surplus of $441 million (2021 – surplus of $600 million). For 2023, the contributions to the plans are expected to be approximately $3 million.[1]

The Company's supplemental pension plans for executives are not funded; benefits under these plans are paid as they become due. During 2022, the Company paid benefits of $56 million (2021 – $59 million) under these plans. As at December 31, 2022, the defined benefit obligation for these plans, which is reflected as a liability in the balance sheet, amounted to $561 million (2021 – $687 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, 2022, the difference between the fair value of plan assets and the defined benefit obligation for these plans was a surplus of $57 million (2021 – surplus of $3 million).

Income Taxes

The Company is subject to income tax laws in various jurisdictions. Tax laws are complex and potentially subject to different interpretations by the taxpayer and the relevant tax authority. The provision for income taxes represents management's interpretation of the relevant tax laws and its estimate of current and future income tax implications of the transactions and events during the period. A deferred tax asset or liability results from temporary differences between carrying values of 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 carryforward 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, 2022, we had $5,423 million of deferred tax assets (December 31, 2021 – $5,254 million). Factors in management's determination include, among others, the following:

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

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

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, 2022, under IFRS we had $6,014 million of goodwill and $4,505 million of intangible assets ($1,861 million of which are intangible assets with indefinite lives). Goodwill and intangible assets with indefinite lives are tested for impairment 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 2022 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 recoverable 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 2023 will be updated based on the conditions that exist in 2023 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 2022 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 "Insurance Contracts" 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 replaced 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. When IFRS 9 is first adopted, entities have the option to apply the hedge accounting requirements under IFRS 9 or to continue to apply the hedge accounting requirements under IAS 39. Such option will apply to all hedge accounting relationships.

Revisions issued in July 2014 replaced 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 addressed the income statement accounting mismatches and short-term volatility issues which have been identified as a result of the insurance contracts project.

The Company has adopted IFRS 9 beginning on January 1, 2023 as permitted under the June 2020 amendments to IFRS 4 "Insurance Contracts". The adoption of IFRS 9 resulted in certain differences in the classification and measurement of financial assets when compared to their classification and measurement under IAS 39.

The Company has elected to apply the hedge accounting requirements under IFRS 9 to all hedge accounting relationships prospectively. As at January 1, 2023, all existing IAS 39 hedge accounting relationships were assessed and qualify for hedge accounting under IFRS 9. These existing relationships are treated as continuing hedge accounting relationships under IFRS 9 beginning on January 1, 2023; and will be disclosed with comparative information for 2022 under IAS 39.

The Company also designated new hedge accounting relationships with the objective to reduce accounting mismatches between hedging derivatives' changes in income and financial risk changes in OCI for IFRS 17 insurance liabilities and IFRS 9 financial assets. New hedge accounting relationships are effective prospectively on January 1, 2023; and will not have comparative disclosure in the financial statements for 2022.

IFRS 17 "Insurance Contracts"

IFRS 17 "Insurance Contracts" was issued in May 2017 to be effective 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 replaced IFRS 4 "Insurance Contracts" and materially changed the recognition and measurement of insurance contracts and the corresponding presentation and disclosures in the Company's Financial Statements.

Narrow-scope amendments to IFRS 17 "Insurance Contracts" were issued in December 2021 and were effective on initial application of IFRS 17 and IFRS 9 "Financial Instruments" which the Company has adopted on January 1, 2023. The amendments reduce accounting mismatches between insurance contract liabilities and financial assets in scope of IFRS 9 within comparative prior periods when initially applying IFRS 17 and IFRS 9. The amendments allow insurers to present comparative information on financial assets as if IFRS 9 were fully applicable during the comparative period. The amendments do not permit application of IFRS 9 hedge accounting principles to the comparative period.

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

- Under IFRS 17 new business gains are recorded on the Consolidated Statements of Financial Position (in the CSM component of the insurance contract liability) and amortized into income as services are provided. New business losses are recorded into income immediately. Under CALM, both new business gains and new business losses were recognized in income immediately.
- Under IFRS 17 the Company aggregates insurance contracts that are subject to similar risks and managed together into portfolios. Since new business gains and losses have different accounting treatments, insurance contracts are further aggregated into groups by profitability and issuance period to limit offsetting of new business gains and losses. Such aggregation of contracts into groups is required on initial recognition and not reassessed subsequently. Under CALM, new business gains and new business losses offset each other in income.
- Under IFRS 17 the discount rate used to estimate the present value of insurance contract liabilities is based on the characteristics of the liabilities. Under CALM, the rates of returns for current and projected assets supporting insurance contract liabilities were used to value the liabilities. The difference in the discount rate approach also impacts the timing of investment results. Under IFRS 17, the impact of investing activities will emerge into earnings over the life of the assets. Under CALM, the impact of investing activities was capitalized into reserves and therefore earnings in the period they occurred.
- Under IFRS 17 the insurance contract liability discount rate is not related to the expected return on our ALDA and public equity assets, and, as a result, the earnings sensitivity of a change in return assumptions for ALDA and public equity assets will be significantly reduced.
- Under IFRS 17 the Company has elected the option to record changes in insurance contract liabilities arising from changes in interest rates through other comprehensive income, for substantially all insurance products, and classify debt instruments supporting these insurance contract liabilities as fair value through other comprehensive income under IFRS 9. Under CALM, changes in insurance contract liabilities were recorded in income and supporting debt instruments were classified as FVTPL.
- Under IFRS 17 the Company separates specific embedded derivatives and distinct investment components from insurance contracts and accounts for them under IFRS 9. Under IFRS 4 the treatment of embedded derivatives is consistent with IFRS 17, however under IFRS 4 the Company did not separate deposit components as this was not required by the standard.
- Under IFRS 17 insurance contracts with different features are measured by one of the three measurement models: General Measurement Model ("GMM"), Premium Allocation Approach ("PAA") and Variable Fee Approach ("VFA"). Under IFRS 4, insurance contracts were generally valued by one measurement model, although an unearned premium reserve method similar to PAA was allowed and used by Manulife for certain short duration / annually renewable business.

In addition, there are significant changes to presentation and disclosure of the financial statements. The following outlines some of the key presentation and disclosure changes:

- Consolidated Statements of Financial Position: Under IFRS 17 the Company presents portfolios of insurance and reinsurance contracts issued separately from portfolios of reinsurance contracts held, and portfolios in asset position are further presented separately from portfolios in liability position. Under CALM, contracts were not split and presented by asset and liability position.
- Consolidated Statements of Comprehensive Income: Under IFRS 17 the Company separately presents insurance revenue, insurance service expense, insurance finance income or expenses, and income or expenses from reinsurance contracts held. Under CALM the Company reported premium income, gross claims and benefits, changes in insurance contract liabilities, benefits and expenses ceded to reinsurers, and changes in reinsurance assets.

A summary of some of the key risks are outlined in the "Risk Factors and Risk Management – Emerging Risks" section above.

The Company is required to prepare an opening balance sheet as at January 1, 2022, the date of transition to IFRS 17, which forms the starting point for its financial reporting in accordance with IFRS 17. Any differences between the carrying value and the presentation of assets, liabilities and equity determined in accordance with CALM and IFRS 17 as at January 1, 2022 will be recorded in opening retained earnings and accumulated other comprehensive income.

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, 2022, 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, 2022.

MFC's Audit Committee has reviewed this MD&A and the 2022 Consolidated Financial Statements and MFC's Board 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 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. 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, 2022 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, 2022, 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, 2022 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, 2022. Their report expressed an unqualified opinion on the effectiveness of the Company's internal control over financial reporting as of December 31, 2022.

Changes in Internal Control over Financial Reporting

No changes were made in our internal control over financial reporting during the year ended December 31, 2022 that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

13. Non-GAAP and Other Financial Measures

The Company prepares its Consolidated Financial Statements in accordance with International Financial Reporting Standards ("IFRS") as issued by the International Accounting Standards Board. We use a number of non-GAAP and other financial measures to evaluate overall performance and to assess each of our businesses. This section includes information required by National Instrument 52-112 – *Non-GAAP and Other Financial Measures Disclosure* in respect of "specified financial measures" (as defined therein).

Non-GAAP financial measures include core earnings (loss); pre-tax core earnings; core earnings available to common shareholders; core earnings before income taxes, depreciation and amortization ("core EBITDA"); core general expenses; core revenue, Manulife Bank net lending assets; Manulife Bank average net lending assets; assets under management ("AUM"); assets under management and administration ("AUMA"); Global WAM managed AUMA; core revenue and net annualized fee income. In addition, non-GAAP financial measures include the following stated on a constant exchange rate ("CER") basis: any of the foregoing non-GAAP financial measures; Global WAM revenue; net income attributed to shareholders; and common shareholders' net income.

Non-GAAP ratios include core ROE; diluted core earnings per common share ("core EPS"); common share core dividend payout ratio; expense efficiency ratio; core EBITDA margin; effective tax rate on core earnings and net annualized fee income yield on average AUMA. In addition, non-GAAP ratios include the percentage growth/decline on a CER basis in any of the above non-GAAP financial measures; Global WAM revenue; net income attributed to shareholders; common shareholders' net income; pre-tax net income attributed to shareholders; general expenses; basic earnings per common share; and diluted earnings per common share.

Other specified financial measures include assets under administration ("AUA"); consolidated capital; embedded value; new business value ("NBV"); new business value margin ("NBV margin"); sales; annualized premium equivalent ("APE") sales; gross flows; net flows; market value to book value ratio; average assets under management and administration ("average AUMA"), Global WAM average managed AUMA; average assets under administration; remittances; any of the foregoing specified financial measures stated on a CER basis; and percentage growth/decline in any of the foregoing specified financial measures on a CER basis.

Non-GAAP financial measures and non-GAAP ratios are not standardized financial measures under GAAP and, therefore, might not be comparable to similar financial measures disclosed 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 financial 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. We also base our mid and long-term strategic priorities on core earnings.

While core earnings is relevant to how we manage our business and offers a consistent methodology, it is not insulated from macroeconomic factors which can have a significant impact. See below for reconciliation of core earnings to net income attributed to shareholders and income before income taxes. Net income attributed to shareholders excludes net income attributed to participating policyholders and non-controlling interests.

The items included in core earnings and items excluded from core earnings are determined in accordance with the methodology under OSFI's Source of Earnings Disclosure (Life Insurance Companies) guideline and are listed below.

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, including core investment gains, calculated from the introduction of core earnings in 2012 to the end of 2022 was $607 million (2012 to the end of 2021 was $546 million).
  - The decision announced on December 22, 2017 to reduce the allocation to ALDA in the portfolio asset mix supporting our legacy businesses was the first strategic asset mix change since we introduced the core earnings metric in 2012. We refined our description of investment-related experience in 2017 to note that asset mix changes other than those related to a strategic change are taken into consideration in the investment-related experience component of core investment gains.
  - While historical investment return time horizons may vary in length based on underlying asset classes generally exceeding 20 years, for purposes of establishing the threshold, we look at a business cycle that is five or more years and includes a recession. We monitor the appropriateness of the threshold as part of our annual five-year planning process and would adjust it, either to a higher or lower amount, in the future if we believed that our threshold was no longer appropriate.
  - Specific criteria used for evaluating a potential adjustment to the threshold may include, but are not limited to, the extent to which actual investment-related experience differs materially from actuarial assumptions used in measuring insurance contract liabilities, material market events, material dispositions or acquisitions of assets, and regulatory or accounting changes.

Core investment gains are reported in the Corporate and Other segment, with an offsetting adjustment to investment-related experience gains and losses in items excluded from core earnings.

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. Net income (loss) attributed to participating policyholders and non-controlling interests.
11. Impact of enacted or substantially enacted income tax rate changes.

Reconciliation of core earnings to net income attributed to shareholders

	2022					
($ millions, post-tax and based on actual foreign exchange rates in effect in the applicable reporting period, unless otherwise stated)	Asia	Canada	U.S.	Global WAM	Corporate and Other	Total
Income (loss) before income taxes	$ 2,063	$ 2,621	$ 4,877	$ 1,546	$ (2,360)	$ 8,747
Income tax (expense) recovery						
Core earnings	(309)	(482)	(332)	(218)	106	(1,235)
Items excluded from core earnings	(1)	(295)	(553)	(5)	524	(330)
Income tax (expense) recovery	(310)	(777)	(885)	(223)	630	(1,565)
Net income (post-tax)	1,753	1,844	3,992	1,323	(1,730)	7,182
Less: Net income (post-tax) attributed to						
Non-controlling interests	(4)	–	–	2	1	(1)
Participating policyholders	(467)	314	42	–	–	(111)
Net income (loss) attributed to shareholders (post-tax)	2,224	1,530	3,950	1,321	(1,731)	7,294
Less: Items excluded from core earnings[1]						
Investment-related experience outside of core earnings	31	70	1,183	–	(467)	817
Direct impact of equity markets and interest rates and variable annuity guarantee liabilities	153	76	197	–	(1,266)	(840)
Change in actuarial methods and assumptions	(45)	35	36	–	10	36
Restructuring charge	–	–	–	–	–	–
Reinsurance transactions, tax related items and other	(47)	(10)	834	80	242	1,099
Core earnings (post-tax)	$ 2,132	$ 1,359	$ 1,700	$ 1,241	$ (250)	$ 6,182
Income tax on core earnings (see above)	309	482	332	218	(106)	1,235
Core earnings (pre-tax)	$ 2,441	$ 1,841	$ 2,032	$ 1,459	$ (356)	$ 7,417

[1] These items are disclosed under OSFI's Source of Earnings Disclosure (Life Insurance Companies) guideline.

Core earnings, CER basis and U.S. dollars

	2022					
(Canadian $ millions, post-tax and based on actual foreign exchange rates in effect in the applicable reporting period, unless otherwise stated)	Asia	Canada	U.S.	Global WAM	Corporate and Other	Total
Core earnings (post-tax)	$ 2,132	$ 1,359	$ 1,700	$ 1,241	$ (250)	$ 6,182
CER adjustment[1]	40	–	79	33	(2)	150
Core earnings, CER basis (post-tax)	$ 2,172	$ 1,359	$ 1,779	$ 1,274	$ (252)	$ 6,332
Income tax on core earnings, CER basis[2]	313	482	349	220	(107)	1,257
Core earnings, CER basis (pre-tax)	$ 2,485	$ 1,841	$ 2,128	$ 1,494	$ (359)	$ 7,589
Core earnings (U.S. dollars) – Asia and U.S. segments						
Core earnings (post-tax)[3], US $	$ 1,637		$ 1,311			
CER adjustment US $[1]	(40)		–			
Core earnings, CER basis (post-tax), US $	$ 1,597		$ 1,311			

[1] The impact of updating foreign exchange rates to that which was used in 4Q22.

[2] Income tax on core earnings adjusted to reflect the foreign exchange rates for the Statement of Income in effect for 4Q22.

[3] Core earnings (post-tax) in Canadian $ is translated to US $ using the US $ Statement of Income exchange rate for the four respective quarters that make up 2022 core earnings.

Reconciliation of core earnings to net income attributed to shareholders

($ millions, post-tax and based on actual foreign exchange rates in effect in the applicable reporting period, unless otherwise stated)	2021						2020
	Asia	Canada	U.S.	Global WAM	Corporate and Other	Total	Total
Income (loss) before income taxes	$ 3,188	$ 1,791	$ 2,484	$ 1,641	$ (979)	$ 8,125	$ 6,771
Income tax (expense) recovery							
Core earnings	(322)	(413)	(418)	(234)	27	(1,360)	(1,168)
Items excluded from core earnings	(122)	77	32	1	159	147	(27)
Income tax (expense) recovery	(444)	(336)	(386)	(233)	186	(1,213)	(1,195)
Net income (post-tax)	2,744	1,455	2,098	1,408	(793)	6,912	5,576
Less: Net income (post-tax) attributed to							
Non-controlling interests	254	–	–	2	(1)	255	250
Participating policyholders	(567)	101	18	–	–	(448)	(545)
Net income (loss) attributed to shareholders (post-tax)	3,057	1,354	2,080	1,406	(792)	7,105	5,871
Less: Items excluded from core earnings[1]							
Investment-related experience outside of core earnings	313	329	1,341	–	(341)	1,642	(792)
Direct impact of equity markets and interest rates and variable annuity guarantee liabilities	169	(89)	(727)	–	(170)	(817)	932
Change in actuarial methods and assumptions	343	(65)	(314)	–	(5)	(41)	(198)
Restructuring charge	–	–	–	–	(115)	(115)	–
Reinsurance transactions, tax related items and other	56	–	(156)	–	–	(100)	413
Core earnings (post-tax)	$ 2,176	$ 1,179	$ 1,936	$ 1,406	$ (161)	$ 6,536	$ 5,516
Income tax on core earnings (see above)	322	413	418	234	(27)	1,360	
Core earnings (pre-tax)	$ 2,498	$ 1,592	$ 2,354	$ 1,640	$ (188)	$ 7,896	

[1] These items are disclosed under OSFI's Source of Earnings Disclosure (Life Insurance Companies) guideline.

Core earnings, CER basis and U.S. dollars

(Canadian $ millions, post-tax and based on actual foreign exchange rates in effect in the applicable reporting period, unless otherwise stated)	2021					
	Asia	Canada	U.S.	Global WAM	Corporate and Other	Total
Core earnings (post-tax)	$ 2,176	$ 1,179	$ 1,936	$ 1,406	$ (161)	$ 6,536
CER adjustment[1]	34	–	160	76	(2)	268
Core earnings, CER basis (post-tax)	$ 2,210	$ 1,179	$ 2,096	$ 1,482	$ (163)	$ 6,804
Income tax on core earnings, CER basis[2]	325	413	453	238	(26)	1,403
Core earnings, CER basis (pre-tax)	$ 2,535	$ 1,592	$ 2,549	$ 1,720	$ (189)	$ 8,207
Core earnings (U.S. dollars) – Asia and U.S. segments						
Core earnings (post-tax)[3], US $	$ 1,736		$ 1,544			
CER adjustment US $[1]	(110)		–			
Core earnings, CER basis (post-tax), US $	$ 1,626		$ 1,544			

[1] The impact of updating foreign exchange rates to that which was used in 4Q22.

[2] Income tax on core earnings adjusted to reflect the foreign exchange rates for the Statement of Income in effect for 4Q22.

[3] Core earnings (post-tax) in Canadian $ is translated to US $ using the US $ Statement of Income exchange rate for the four respective quarters that make up 2021 core earnings.

Reconciliation of core earnings to net income attributed to shareholders

	4Q22					
($ millions, post-tax and based on actual foreign exchange rates in effect in the applicable reporting period, unless otherwise stated)	Asia	Canada	U.S.	Global WAM	Corporate and Other	Total
Income (loss) before income taxes	$ 690	$ 698	$ 524	$ 403	$ (173)	$ 2,142
Income tax (expense) recovery						
Core earnings	(100)	(137)	(73)	(50)	58	(302)
Items excluded from core earnings	(36)	(169)	(14)	(5)	360	136
Income tax (expense) recovery	(136)	(306)	(87)	(55)	418	(166)
Net income (post-tax)	554	392	437	348	245	1,976
Less: Net income (post-tax) attributed to						
Non-controlling interests	6	–	–	1	–	7
Participating policyholders	(21)	72	27	–	–	78
Net income (loss) attributed to shareholders (post-tax)	569	320	410	347	245	1,891
Less: Items excluded from core earnings[1]						
Investment-related experience outside of core earnings	(110)	(166)	(62)	–	(119)	(457)
Direct impact of equity markets and interest rates and variable annuity guarantee liabilities	110	146	63	–	(135)	184
Change in actuarial methods and assumptions	–	–	–	–	–	–
Restructuring charge	–	–	–	–	–	–
Reinsurance transactions, tax related items and other	–	(10)	35	80	313	418
Core earnings (post-tax)	$ 569	$ 350	$ 374	$ 267	$ 186	$ 1,746
Income tax on core earnings (see above)	100	137	73	50	(58)	302
Core earnings (pre-tax)	$ 669	$ 487	$ 447	$ 317	$ 128	$ 2,048

[1] These items are disclosed under OSFI's Source of Earnings Disclosure (Life Insurance Companies) guideline.

Core earnings, CER basis and U.S. dollars

	4Q22					
(Canadian $ millions, post-tax and based on actual foreign exchange rates in effect in the applicable reporting period, unless otherwise stated)	Asia	Canada	U.S.	Global WAM	Corporate and Other	Total
Core earnings (post-tax)	$ 569	$ 350	$ 374	$ 267	$ 186	$ 1,746
CER adjustment[1]	–	–	–	–	–	–
Core earnings, CER basis (post-tax)	$ 569	$ 350	$ 374	$ 267	$ 186	$ 1,746
Income tax on core earnings, CER basis[2]	100	137	73	50	(58)	302
Core earnings, CER basis (pre-tax)	$ 669	$ 487	$ 447	$ 317	$ 128	$ 2,048
Core earnings (U.S. dollars) – Asia and U.S. segments						
Core earnings (post-tax)[3], US $	$ 418		$ 276			
CER adjustment US $[1]	–		–			
Core earnings, CER basis (post-tax), US $	$ 418		$ 276			

[1] The impact of updating foreign exchange rates to that which was used in 4Q22.

[2] Income tax on core earnings adjusted to reflect the foreign exchange rates for the Statement of Income in effect for 4Q22.

[3] Core earnings (post-tax) in Canadian $ is translated to US $ using the US $ Statement of Income exchange rate for 4Q22.

Reconciliation of core earnings to net income attributed to shareholders

($ millions, post-tax and based on actual foreign exchange rates in effect in the applicable reporting period, unless otherwise stated)	3Q22 Asia	Canada	U.S.	Global WAM	Corporate and Other	Total
Income (loss) before income taxes	$ 476	$ 819	$ 766	$ 395	$ (819)	$ 1,637
Income tax (expense) recovery						
Core earnings	(61)	(116)	(62)	(50)	18	(271)
Items excluded from core earnings	2	(75)	(52)	–	64	(61)
Income tax (expense) recovery	(59)	(191)	(114)	(50)	82	(332)
Net income (post-tax)	417	628	652	345	(737)	1,305
Less: Net income (post-tax) attributed to						
Non-controlling interests	(19)	–	–	–	1	(18)
Participating policyholders	(85)	50	11	–	–	(24)
Net income (loss) attributed to shareholders (post-tax)	521	578	641	345	(738)	1,347
Less: Items excluded from core earnings[1]						
Investment-related experience outside of core earnings	(3)	97	127	–	(96)	125
Direct impact of equity markets and interest rates and variable annuity guarantee liabilities	95	96	137	–	(382)	(54)
Change in actuarial methods and assumptions	(45)	35	36	–	10	36
Restructuring charge	–	–	–	–	–	–
Reinsurance transactions, tax related items and other	(39)	–	(43)	–	–	(82)
Core earnings (post-tax)	$ 513	$ 350	$ 384	$ 345	$ (270)	$ 1,322
Income tax on core earnings (see above)	61	116	62	50	(18)	271
Core earnings (pre-tax)	$ 574	$ 466	$ 446	$ 395	$ (288)	$ 1,593

[1] These items are disclosed under OSFI's Source of Earnings Disclosure (Life Insurance Companies) guideline.

Core earnings, CER basis and U.S. dollars

(Canadian $ millions, post-tax and based on actual foreign exchange rates in effect in the applicable reporting period, unless otherwise stated)	3Q22 Asia	Canada	U.S.	Global WAM	Corporate and Other	Total
Core earnings (post-tax)	$ 513	$ 350	$ 384	$ 345	$ (270)	$ 1,322
CER adjustment[1]	15	–	15	8	(8)	30
Core earnings, CER basis (post-tax)	$ 528	$ 350	$ 399	$ 353	$ (278)	$ 1,352
Income tax on core earnings, CER basis[2]	62	116	65	50	(18)	275
Core earnings, CER basis (pre-tax)	$ 590	$ 466	$ 464	$ 403	$ (296)	$ 1,627
Core earnings (U.S. dollars) – Asia and U.S. segments						
Core earnings (post-tax)[3], US $	$ 394		$ 294			
CER adjustment US $[1]	(6)		–			
Core earnings, CER basis (post-tax), US $	$ 388		$ 294			

[1] The impact of updating foreign exchange rates to that which was used in 4Q22.
[2] Income tax on core earnings adjusted to reflect the foreign exchange rates for the Statement of Income in effect for 4Q22.
[3] Core earnings (post-tax) in Canadian $ is translated to US $ using the US $ Statement of Income exchange rate for 3Q22.

Reconciliation of core earnings to net income attributed to shareholders

($ millions, post-tax and based on actual foreign exchange rates in effect in the applicable reporting period, unless otherwise stated)	2Q22					
	Asia	Canada	U.S.	Global WAM	Corporate and Other	Total
Income (loss) before income taxes	$ 216	$ 224	$ 1,010	$ 362	$ (555)	$ 1,257
Income tax (expense) recovery						
Core earnings	(74)	(119)	(92)	(57)	4	(338)
Items excluded from core earnings	44	64	(82)	–	54	80
Income tax (expense) recovery	(30)	(55)	(174)	(57)	58	(258)
Net income (post-tax)	186	169	836	305	(497)	999
Less: Net income (post-tax) attributed to						
Non-controlling interests	(11)	–	–	–	–	(11)
Participating policyholders	(164)	84	4	–	–	(76)
Net income (loss) attributed to shareholders (post-tax)	361	85	832	305	(497)	1,086
Less: Items excluded from core earnings(1)						
Investment-related experience outside of core earnings	80	86	591	–	(166)	591
Direct impact of equity markets and interest rates and variable annuity guarantee liabilities	(232)	(346)	(215)	–	(274)	(1,067)
Change in actuarial methods and assumptions	–	–	–	–	–	–
Restructuring charge	–	–	–	–	–	–
Reinsurance transactions, tax related items and other	–	–	–	–	–	–
Core earnings (post-tax)	$ 513	$ 345	$ 456	$ 305	$ (57)	$ 1,562
Income tax on core earnings (see above)	74	119	92	57	(4)	338
Core earnings (pre-tax)	$ 587	$ 464	$ 548	$ 362	$ (61)	$ 1,900

(1) These items are disclosed under OSFI's Source of Earnings Disclosure (Life Insurance Companies) guideline.

Core earnings, CER basis and U.S. dollars

(Canadian $ millions, post-tax and based on actual foreign exchange rates in effect in the applicable reporting period, unless otherwise stated)	2Q22					
	Asia	Canada	U.S.	Global WAM	Corporate and Other	Total
Core earnings (post-tax)	$ 513	$ 345	$ 456	$ 305	$ (57)	$ 1,562
CER adjustment(1)	17	–	29	11	3	60
Core earnings, CER basis (post-tax)	$ 530	$ 345	$ 485	$ 316	$ (54)	$ 1,622
Income tax on core earnings, CER basis(2)	77	119	98	58	(5)	347
Core earnings, CER basis (pre-tax)	$ 607	$ 464	$ 583	$ 374	$ (59)	$ 1,969
Core earnings (U.S. dollars) – Asia and U.S. segments						
Core earnings (post-tax)(3), US $	$ 401		$ 357			
CER adjustment US $(1)	(11)		–			
Core earnings, CER basis (post-tax), US $	$ 390		$ 357			

(1) The impact of updating foreign exchange rates to that which was used in 4Q22.
(2) Income tax on core earnings adjusted to reflect the foreign exchange rates for the Statement of Income in effect for 4Q22.
(3) Core earnings (post-tax) in Canadian $ is translated to US $ using the US $ Statement of Income exchange rate for 2Q22.

Reconciliation of core earnings to net income attributed to shareholders

	1Q22					
($ millions, post-tax and based on actual foreign exchange rates in effect in the applicable reporting period, unless otherwise stated)	Asia	Canada	U.S.	Global WAM	Corporate and Other	Total
Income (loss) before income taxes	$ 681	$ 880	$ 2,577	$ 386	$ (813)	$ 3,711
Income tax (expense) recovery						
Core earnings	(74)	(110)	(105)	(61)	26	(324)
Items excluded from core earnings	(11)	(115)	(405)	–	46	(485)
Income tax (expense) recovery	(85)	(225)	(510)	(61)	72	(809)
Net income (post-tax)	596	655	2,067	325	(741)	2,902
Less: Net income (post-tax) attributed to						
Non-controlling interests	20	–	–	1	–	21
Participating policyholders	(197)	108	–	–	–	(89)
Net income (loss) attributed to shareholders (post-tax)	773	547	2,067	324	(741)	2,970
Less: Items excluded from core earnings[1]						
Investment-related experience outside of core earnings	64	53	527	–	(86)	558
Direct impact of equity markets and interest rates and variable annuity guarantee liabilities	180	180	212	–	(475)	97
Change in actuarial methods and assumptions	–	–	–	–	–	–
Restructuring charge	–	–	–	–	–	–
Reinsurance transactions, tax related items and other	(8)	–	842	–	(71)	763
Core earnings (post-tax)	$ 537	$ 314	$ 486	$ 324	$ (109)	$ 1,552
Income tax on core earnings (see above)	74	110	105	61	(26)	324
Core earnings (pre-tax)	$ 611	$ 424	$ 591	$ 385	$ (135)	$ 1,876

[1] These items are disclosed under OSFI's Source of Earnings Disclosure (Life Insurance Companies) guideline.

Core earnings, CER basis and U.S. dollars

	1Q22					
(Canadian $ millions, post-tax and based on actual foreign exchange rates in effect in the applicable reporting period, unless otherwise stated)	Asia	Canada	U.S.	Global WAM	Corporate and Other	Total
Core earnings (post-tax)	$ 537	$ 314	$ 486	$ 324	$ (109)	$ 1,552
CER adjustment[1]	8	–	35	14	3	60
Core earnings, CER basis (post-tax)	$ 545	$ 314	$ 521	$ 338	$ (106)	$ 1,612
Income tax on core earnings, CER basis[2]	74	110	113	62	(26)	333
Core earnings, CER basis (pre-tax)	$ 619	$ 424	$ 634	$ 400	$ (132)	$ 1,945
Core earnings (U.S. dollars) – Asia and U.S. segments						
Core earnings (post-tax)[3], US $	$ 424		$ 384			
CER adjustment US $[1]	(23)		–			
Core earnings, CER basis (post-tax), US $	$ 401		$ 384			

[1] The impact of updating foreign exchange rates to that which was used in 4Q22.

[2] Income tax on core earnings adjusted to reflect the foreign exchange rates for the Statement of Income in effect for 4Q22.

[3] Core earnings (post-tax) in Canadian $ is translated to US $ using the US $ Statement of Income exchange rate for 1Q22.

Reconciliation of core earnings to net income attributed to shareholders

($ millions, post-tax and based on actual foreign exchange rates in effect in the applicable reporting period, unless otherwise stated)	4Q21					
	Asia	Canada	U.S.	Global WAM	Corporate and Other	Total
Income (loss) before income taxes	$ 684	$ 806	$ 614	$ 438	$ (61)	$ 2,481
Income tax (expense) recovery						
Core earnings	(68)	(101)	(117)	(52)	(8)	(346)
Items excluded from core earnings	(15)	(77)	(4)	2	10	(84)
Income tax (expense) recovery	(83)	(178)	(121)	(50)	2	(430)
Net income (post-tax)	601	628	493	388	(59)	2,051
Less: Net income (post-tax) attributed to						
Non-controlling interests	32	–	–	1	(1)	32
Participating policyholders	(76)	12	(1)	–	–	(65)
Net income (loss) attributed to shareholders (post-tax)	645	616	494	387	(58)	2,084
Less: Items excluded from core earnings[1]						
Investment-related experience outside of core earnings	58	90	58	–	(80)	126
Direct impact of equity markets and interest rates and variable annuity guarantee liabilities	32	240	125	–	1	398
Change in actuarial methods and assumptions	–	–	–	–	–	–
Restructuring charge	–	–	–	–	–	–
Reinsurance transactions, tax related items and other	8	–	(156)	–	–	(148)
Core earnings (post-tax)	$ 547	$ 286	$ 467	$ 387	$ 21	$ 1,708
Income tax on core earnings (see above)	68	101	117	52	8	346
Core earnings (pre-tax)	$ 615	$ 387	$ 584	$ 439	$ 29	$ 2,054

[1] These items are disclosed under OSFI's Source of Earnings Disclosure (Life Insurance Companies) guideline.

Core earnings, CER basis and U.S. dollars

(Canadian $ millions, post-tax and based on actual foreign exchange rates in effect in the applicable reporting period, unless otherwise stated)	4Q21					
	Asia	Canada	U.S.	Global WAM	Corporate and Other	Total
Core earnings (post-tax)	$ 547	$ 286	$ 467	$ 387	$ 21	$ 1,708
CER adjustment[1]	13	–	35	20	3	71
Core earnings, CER basis (post-tax)	$ 560	$ 286	$ 502	$ 407	$ 24	$ 1,779
Income tax on core earnings, CER basis[2]	68	101	127	52	8	356
Core earnings, CER basis (pre-tax)	$ 628	$ 387	$ 629	$ 459	$ 32	$ 2,135
Core earnings (U.S. dollars) – Asia and U.S. segments						
Core earnings (post-tax)[3], US $	$ 435		$ 370			
CER adjustment US $[1]	(23)		–			
Core earnings, CER basis (post-tax), US $	$ 412		$ 370			

[1] The impact of updating foreign exchange rates to that which was used in 4Q22.

[2] Income tax on core earnings adjusted to reflect the foreign exchange rates for the Statement of Income in effect for 4Q22.

[3] Core earnings (post-tax) in Canadian $ is translated to US $ using the US $ Statement of Income exchange rate for 4Q21.

Segment core earnings by business line or geographic source

($ millions, post-tax and based on actual foreign exchange rates in effect in the applicable reporting period, unless otherwise stated)

Asia

	Quarterly Results					Full Year Results	
(US $ millions)	**4Q22**	3Q22	2Q22	1Q22	4Q21	**2022**	2021
Hong Kong	**$ 224**	$ 217	$ 216	$ 219	$ 270	**$ 876**	$ 949
Japan	**84**	89	84	77	77	**334**	323
Asia Other[1]	**145**	115	132	156	132	**548**	619
Mainland China						***16***	*96*
Singapore						***161***	*162*
Vietnam						***309***	*290*
Other Emerging Markets[2]						***62***	*71*
Regional Office	**(35)**	(27)	(31)	(28)	(44)	**(121)**	(155)
Total Asia core earnings	**$ 418**	$ 394	$ 401	$ 424	$ 435	**$ 1,637**	$ 1,736

[1] Core earnings for Asia Other is reported by country annually, on a full year basis.

[2] Other Emerging Markets includes Indonesia, the Philippines, Malaysia, Thailand, Cambodia and Myanmar.

	Quarterly Results					Full Year Results	
(US $ millions), CER basis[1]	**4Q22**	3Q22	2Q22	1Q22	4Q21	**2022**	2021
Hong Kong	**$ 224**	$ 217	$ 216	$ 219	$ 270	**$ 876**	$ 949
Japan	**84**	87	78	63	62	**312**	251
Asia Other[2]	**145**	112	127	147	124	**531**	581
Mainland China						***14***	*87*
Singapore						***160***	*158*
Vietnam						***298***	*274*
Other Emerging Markets[3]						***59***	*62*
Regional Office	**(35)**	(28)	(31)	(28)	(44)	**(122)**	(155)
Total Asia core earnings, CER basis	**$ 418**	$ 388	$ 390	$ 401	$ 412	**$ 1,597**	$ 1,626

[1] Core earnings adjusted to reflect the foreign exchange rates for the Statement of Income in effect for 4Q22.

[2] Core earnings for Asia Other is reported by country annually, on a full year basis.

[3] Other Emerging Markets includes Indonesia, the Philippines, Malaysia, Thailand, Cambodia and Myanmar.

Canada

	Quarterly Results					Full Year Results	
(Canadian $ millions)	**4Q22**	3Q22	2Q22	1Q22	4Q21	**2022**	2021
Insurance	**$ 240**	$ 240	$ 233	$ 206	$ 184	**$ 919**	$ 770
Annuities	**59**	56	68	70	62	**253**	234
Manulife Bank	**51**	54	44	38	40	**187**	175
Total Canada core earnings	**$ 350**	$ 350	$ 345	$ 314	$ 286	**$ 1,359**	$ 1,179

U.S.

	Quarterly Results					Full Year Results	
(US $ millions)	**4Q22**	3Q22	2Q22	1Q22	4Q21	**2022**	2021
U.S. Insurance	**$ 235**	$ 244	$ 316	$ 328	$ 274	**$ 1,123**	$ 1,128
U.S. Annuities	**41**	50	41	56	96	**188**	416
Total U.S. core earnings	**$ 276**	$ 294	$ 357	$ 384	$ 370	**$ 1,311**	$ 1,544

Global WAM by business line

	Quarterly Results					Full Year Results	
(Canadian $ millions)	**4Q22**	3Q22	2Q22	1Q22	4Q21	**2022**	2021
Retirement	**$ 164**	$ 193	$ 165	$ 177	$ 218	**$ 699**	$ 819
Retail	**119**	137	126	141	160	**523**	551
Institutional asset management	**(16)**	15	14	6	9	**19**	36
Total Global WAM core earnings	**$ 267**	$ 345	$ 305	$ 324	$ 387	**$ 1,241**	$ 1,406

	Quarterly Results					Full Year Results	
(Canadian $ millions), CER basis(1)	**4Q22**	3Q22	2Q22	1Q22	4Q21	**2022**	2021
Retirement	**$ 164**	$ 198	$ 173	$ 187	$ 231	**$ 722**	$ 873
Retail	**119**	140	129	145	165	**533**	571
Institutional asset management	**(16)**	15	14	6	11	**19**	38
Total Global WAM core earnings, CER basis	**$ 267**	$ 353	$ 316	$ 338	$ 407	**$ 1,274**	$ 1,482

(1) Core earnings adjusted to reflect the foreign exchange rates for the Statement of Income in effect for 4Q22.

Global WAM by geographic source

	Quarterly Results					Full Year Results	
(Canadian $ millions)	**4Q22**	3Q22	2Q22	1Q22	4Q21	**2022**	2021
Asia	**$ 66**	$ 75	$ 76	$ 86	$ 88	**$ 303**	$ 397
Canada	**87**	116	109	108	119	**420**	429
U.S.	**114**	154	120	130	180	**518**	580
Total Global WAM core earnings	**$ 267**	$ 345	$ 305	$ 324	$ 387	**$ 1,241**	$ 1,406

	Quarterly Results					Full Year Results	
(Canadian $ millions), CER basis(1)	**4Q22**	3Q22	2Q22	1Q22	4Q21	**2022**	2021
Asia	**$ 66**	$ 77	$ 80	$ 90	$ 95	**$ 313**	$ 424
Canada	**87**	116	109	108	119	**420**	429
U.S.	**114**	160	127	140	193	**541**	628
Total Global WAM core earnings, CER basis	**$ 267**	$ 353	$ 316	$ 338	$ 407	**$ 1,274**	$ 1,481

(1) Core earnings adjusted to reflect the foreign exchange rates for the Statement of Income in effect for 4Q22.

Corporate and Other

	Quarterly Results					Full Year Results	
(Canadian $ millions)	**4Q22**	3Q22	2Q22	1Q22	4Q21	**2022**	2021
Corporate and Other excluding core investment gains	**$ 86**	$ (370)	$ (157)	$ (209)	$ (79)	**$ (650)**	$ (561)
Core investment gains	**100**	100	100	100	100	**400**	400
Total Corporate and Other core earnings	**$ 186**	$ (270)	$ (57)	$ (109)	$ 21	**$ (250)**	$ (161)

Core earnings available to common shareholders is a financial measure that is used in the calculation of core ROE and core EPS. It is calculated as core earnings (post-tax) less preferred share dividends.

	Quarterly Results					Full Year Results	
($ millions, and based on actual foreign exchange rates in effect in the applicable reporting period, unless otherwise stated)	**4Q22**	3Q22	2Q22	1Q22	4Q21	**2022**	2021
Core earnings	**$ 1,746**	$ 1,322	$ 1,562	$ 1,552	$ 1,708	**$ 6,182**	$ 6,536
Less: Preferred share dividends	**(97)**	(51)	(60)	(52)	(71)	**(260)**	(215)
Core earnings available to common shareholders	**1,649**	1,271	1,502	1,500	1,637	**5,922**	6,321
CER adjustment(1)	**–**	30	60	60	71	**150**	268
Core earnings available to common shareholders, CER basis	**$ 1,649**	$ 1,301	$ 1,562	$ 1,560	$ 1,708	**$ 6,072**	$ 6,589

(1) The impact of updating foreign exchange rates to that which was used in 4Q22.

Core ROE measures profitability using 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 quarterly, as the average of common shareholders' equity at the start and end of the quarter, and annually, as the average of the quarterly average common shareholders' equity for the year.

($ millions, unless otherwise stated)	Quarterly Results					Full Year Results	
	4Q22	3Q22	2Q22	1Q22	4Q21	**2022**	2021
Core earnings available to common shareholders	**$ 1,649**	$ 1,271	$ 1,502	$ 1,500	$ 1,637	**$ 5,922**	$ 6,321
Annualized core earnings available to common shareholders	**$ 6,538**	$ 5,045	$ 6,022	$ 6,085	$ 6,483	**$ 5,922**	$ 6,321
Average common shareholders' equity (see below)	**$ 49,410**	$ 49,129	$ 49,814	$ 51,407	$ 51,049	**$ 49,940**	$ 48,463
Core ROE (annualized) (%)	**13.2%**	10.3%	12.1%	11.8%	12.7%	**11.9%**	13.0%
Average common shareholders' equity							
Total shareholders' and other equity	**$ 56,061**	$ 56,078	$ 55,500	$ 56,457	$ 58,408	**$ 56,061**	$ 58,408
Less: Preferred shares and other equity	**(6,660)**	(6,660)	(6,660)	(5,670)	(6,381)	**(6,660)**	(6,381)
Common shareholders' equity	**$ 49,401**	$ 49,418	$ 48,840	$ 50,787	$ 52,027	**$ 49,401**	$ 52,027
Average common shareholders' equity	**$ 49,410**	$ 49,129	$ 49,814	$ 51,407	$ 51,049	**$ 49,940**	$ 48,463

Core EPS is equal to core earnings available to common shareholders divided by diluted weighted average common shares outstanding.

($ millions, and based on actual foreign exchange rates in effect in the applicable reporting period, unless otherwise stated)	Quarterly Results					Full Year Results	
	4Q22	3Q22	2Q22	1Q22	4Q21	**2022**	2021
Core EPS							
Core earnings available to common shareholders	**$ 1,649**	$ 1,271	$ 1,502	$ 1,500	$ 1,637	**$ 5,922**	$ 6,321
Diluted weighted average common shares outstanding (millions)	**1,881**	1,904	1,924	1,942	1,946	**1,913**	1,946
Core earnings per share	**$ 0.88**	$ 0.67	$ 0.78	$ 0.77	$ 0.84	**$ 3.10**	$ 3.25
Core EPS, CER basis							
Core earnings available to common shareholders, CER basis	**$ 1,649**	$ 1,301	$ 1,562	$ 1,560	$ 1,708	**$ 6,072**	$ 6,589
Diluted weighted average common shares outstanding (millions)	**1,881**	1,904	1,924	1,942	1,946	**1,913**	1,946
Core earnings per share, CER basis	**$ 0.88**	$ 0.68	$ 0.81	$ 0.80	$ 0.88	**$ 3.17**	$ 3.39

Core earnings related to strategic priorities

The Company measures its progress on certain strategic priorities using core earnings. These strategic priorities include core earnings from highest potential businesses, core earnings from Asia region, and core earnings from long-term care insurance ("LTC") and variable annuities ("VA") businesses. The core earnings for these businesses is calculated consistent with our definition of core earnings.

Highest potential businesses

For the years ended December 31,

($ millions, post-tax and based on actual foreign exchange rates in effect in the applicable reporting period)	**2022**	2021	2017(2)
Core earnings highest potential businesses(1)	**$ 3,875**	$ 4,111	$ 2,475
Core earnings – All other businesses excl. core investment gains	**1,907**	2,025	1,690
Core investment gains	**400**	400	400
Core earnings	**6,182**	6,536	4,565
Items excluded from core earnings	**1,112**	569	(2,461)
Net income (loss) attributed to shareholders	**$ 7,294**	$ 7,105	$ 2,104
Highest potential businesses core earnings contribution	**63%**	63%	54%

(1) Includes core earnings from Asia and Global WAM segments, Canada group benefits, and behavioural insurance products.

(2) The 2017 comparative period is presented due to its inclusion in Section 1 "Strategic priorities progress update" above.

Asia region

For the years ended December 31,

($ millions, post-tax and based on actual foreign exchange rates in effect in the applicable reporting period)	**2022**	2021
Core earnings of Asia region(1)	**$ 2,435**	$ 2,573
Core earnings – All other businesses excl. core investment gains	**3,347**	3,563
Core investment gains	**400**	400
Core earnings	**6,182**	6,536
Items excluded from core earnings	**1,112**	569
Net income (loss) attributed to shareholders	**$ 7,294**	$ 7,105
Asia region core earnings contribution	**39%**	39%

(1) Includes core earnings from Asia segment and Global WAM's business in Asia.

LTC & VA businesses

For the years ended December 31,	2022			2021		
($ millions, post-tax and based on actual foreign exchange rates in effect in the applicable reporting period)	Reported	Adjustments	Normalized	Reported	Adjustments[2]	Normalized
Core earnings of LTC and VA businesses[1]	**$ 1,143**	**$ –**	**$ 1,143**	$ 1,426	$ (152)	$ 1,274
Core earnings – All other businesses excl. core investment gains	**4,639**	**–**	**4,639**	4,710	–	4,710
Core investment gains	**400**	**–**	**400**	400	–	400
Core earnings	**6,182**	**–**	**6,182**	6,536	(152)	6,384
Items excluded from core earnings	**1,112**	**–**	**1,112**	569	–	569
Net income (loss) attributed to shareholders	**$ 7,294**	**$ –**	**$ 7,294**	$ 7,105	$ (152)	$ 6,953
LTC & VA Core Earnings contribution	**18%**		**18%**	22%		20%

(1) Includes core earnings from U.S. long-term care and Asia, Canada and U.S. variable annuities businesses.
(2) 2021 total company and U.S. LTC core earnings were normalized to remove estimated gains on U.S. LTC policyholder experience due to COVID-19.

The **effective tax rate on core earnings** is equal to income tax on core earnings divided by pre-tax core earnings.

The Company also uses financial performance measures that are prepared on a **constant exchange rate basis**, which 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). Such financial measures may be stated on a constant exchange rate basis or the percentage growth/decline in the financial measure on a constant exchange rate basis, using the income statement and balance sheet exchange rates effective for the fourth quarter of 2022.

Information supporting constant exchange rate basis for GAAP and non-GAAP financial measures is presented below and throughout the rest of this section.

Net income financial measures on a CER basis

($ Canadian millions, post-tax and based on actual foreign exchange rates in effect in the applicable reporting period, unless otherwise stated)

	Quarterly Results					Full Year Results	
	4Q22	3Q22	2Q22	1Q22	4Q21	**2022**	2021
Net income (loss) attributed to shareholders:							
Asia	**$ 569**	$ 521	$ 361	$ 773	$ 645	**$ 2,224**	$ 3,057
Canada	**320**	578	85	547	616	**1,530**	1,354
U.S.	**410**	641	832	2,067	494	**3,950**	2,080
Global WAM	**347**	345	305	324	387	**1,321**	1,406
Corporate and Other	**245**	(738)	(497)	(741)	(58)	**(1,731)**	(792)
Total net income (loss) attributed to shareholders	**1,891**	1,347	1,086	2,970	2,084	**7,294**	7,105
Preferred share dividends and other equity distributions	**(97)**	(51)	(60)	(52)	(71)	**(260)**	(215)
Common shareholders net income (loss)	**$ 1,794**	$ 1,296	$ 1,026	$ 2,918	$ 2,013	**$ 7,034**	$ 6,890
CER adjustment(1)							
Asia	**$ –**	$ 22	$ 45	$ 80	$ 61	**$ 147**	$ 200
Canada	**–**	–	–	–	–	**–**	–
U.S.	**–**	27	44	145	43	**216**	206
Global WAM	**–**	9	10	11	19	**30**	62
Corporate and Other	**–**	(19)	(17)	(33)	(3)	**(69)**	(8)
Total net income (loss) attributed to shareholders	**–**	39	82	203	120	**324**	460
Preferred share dividends and other equity distributions	**–**	–	–	–	–	**–**	–
Common shareholders net income (loss)	**$ –**	$ 39	$ 82	$ 203	$ 120	**$ 324**	$ 460
Net income (loss) attributed to shareholders, CER basis							
Asia	**$ 569**	$ 543	$ 406	$ 853	$ 706	**$ 2,371**	$ 3,257
Canada	**320**	578	85	547	616	**1,530**	1,354
U.S.	**410**	668	876	2,212	537	**4,166**	2,286
Global WAM	**347**	354	315	335	406	**1,351**	1,468
Corporate and Other	**245**	(757)	(514)	(774)	(61)	**(1,800)**	(800)
Total net income (loss) attributed to shareholders, CER basis	**1,891**	1,386	1,168	3,173	2,204	**7,618**	7,565
Preferred share dividends and other equity distributions, CER basis	**(97)**	(51)	(60)	(52)	(71)	**(260)**	(215)
Common shareholders net income (loss), CER basis	**$ 1,794**	$ 1,335	$ 1,108	$ 3,121	$ 2,133	**$ 7,358**	$ 7,350
Asia net income attributed to shareholders, U.S. dollars							
Asia net income (loss) attributed to shareholders, US$(2)	**$ 419**	$ 399	$ 283	$ 610	$ 513	**$ 1,711**	$ 2,437
CER adjustment, US$(1)	**–**	(1)	15	18	6	**32**	(42)
Asia net income (loss) attributed to shareholders, US$, CER basis(1)	**$ 419**	$ 398	$ 298	$ 628	$ 519	**$ 1,743**	$ 2,395
Net income (loss) attributed to shareholders (pre-tax)							
Net income (loss) attributed to shareholders (post-tax)	**$ 1,891**	$ 1,347	$ 1,086	$ 2,970	$ 2,084	**$ 7,294**	$ 7,105
Tax on net income attributed to shareholders	**91**	310	188	778	440	**1,367**	1,185
Net income (loss) attributed to shareholders (pre-tax)	**1,982**	1,657	1,274	3,748	2,524	**8,661**	8,290
CER adjustment(1)	**–**	47	98	234	80	**379**	273
Net income (loss) attributed to shareholders (pre-tax), CER basis	**$ 1,982**	$ 1,704	$ 1,372	$ 3,982	$ 2,604	**$ 9,040**	$ 8,563

(1) The impact of updating foreign exchange rates to that which was used in 4Q22.

(2) Asia net income attributed to shareholders (post-tax) in Canadian dollars is translated to U.S. dollars using the U.S. dollar Statement of Income rate for the reporting period.

Basic and diluted earnings per share on a CER basis

($ millions, unless otherwise stated)	Quarterly Results					Full Year Results	
	4Q22	3Q22	2Q22	1Q22	4Q21	**2022**	2021
Common shareholders net income, CER basis[1]	**$ 1,794**	$ 1,335	$ 1,108	$ 3,121	$ 2,133	**$ 7,358**	$ 7,359
Weighted average common shares outstanding (millions)	**1,878**	1,902	1,921	1,938	1,943	**1,910**	1,942
Basic EPS, CER basis	**$ 0.95**	$ 0.70	$ 0.58	$ 1.61	$ 1.10	**$ 3.85**	$ 3.79
Common shareholders net income, CER basis[1]	**$ 1,794**	$ 1,335	$ 1,108	$ 3,121	$ 2,133	**$ 7,358**	$ 7,359
Diluted weighted average common shares outstanding (millions)	**1,881**	1,904	1,924	1,942	1,946	**1,913**	1,946
Diluted EPS, CER basis	**$ 0.95**	$ 0.70	$ 0.58	$ 1.61	$ 1.10	**$ 3.85**	$ 3.79

[1] Common shareholders net income adjusted to reflect the foreign exchange rates for the Statement of Income in effect for 4Q22.

General expenses, CER basis

($ millions, and based on actual foreign exchange rates in effect in the applicable reporting period, unless otherwise stated)	Quarterly Results					Full Year Results	
	4Q22	3Q22	2Q22	1Q22	4Q21	**2022**	2021
General expenses	**$ 2,141**	$ 1,900	$ 1,843	$ 1,898	$ 2,000	**$ 7,782**	$ 7,828
CER adjustment[1]	**–**	40	50	43	51	**133**	200
General expenses, CER basis	**$ 2,141**	$ 1,940	$ 1,893	$ 1,941	$ 2,051	**$ 7,915**	$ 8,028

[1] The impact of updating foreign exchange rates to that which was used in 4Q22.

Global WAM revenue, CER basis

($ millions, and based on actual foreign exchange rates in effect in the applicable reporting period, unless otherwise stated)	Quarterly Results					Full Year Results	
	4Q22	3Q22	2Q22	1Q22	4Q21	**2022**	2021
Total revenue	**$ 15,401**	$ 7,777	$ (2,401)	$ (3,630)	$ 21,611	**$ 17,147**	$ 61,821
Less: Revenue for segments other than Global WAM	**13,739**	6,235	(3,922)	(5,216)	19,884	**10,836**	55,280
Global WAM revenue	**1,662**	1,542	1,521	1,586	1,727	**6,311**	6,541
CER adjustment[1]	**–**	39	57	66	79	**162**	312
Global WAM revenue, CER basis	**$ 1,662**	$ 1,581	$ 1,578	$ 1,652	$ 1,806	**$ 6,473**	$ 6,853

[1] The impact of updating foreign exchange rates to that which was used in 4Q22.

Common share core dividend payout ratio is a ratio that measures the percentage of core earnings paid to common shareholders as dividends. It is calculated as dividends per common share divided by core EPS.

	Quarterly Results					Full Year Results	
	4Q22	3Q22	2Q22	1Q22	4Q21	**2022**	2021
Per share dividend	**$ 0.33**	$ 0.33	$ 0.33	$ 0.33	$ 0.33	**$ 1.32**	$ 1.17
Core EPS	**$ 0.88**	$ 0.67	$ 0.78	$ 0.77	$ 0.84	**$ 3.10**	$ 3.25
Common share core dividend payout ratio	**38%**	49%	42%	43%	39%	**43%**	36%

AUMA is a financial measure of the size of the Company. It is comprised of AUM and AUA. AUM includes assets of general fund, consisting of total invested assets and segregated funds net assets, and external client assets for which we provide investment management services, consisting of mutual fund, institutional asset management and other fund net assets. AUA are assets for which we provide administrative services only. Assets under management and administration is a common industry metric for wealth and asset management businesses.

Our Global WAM business also manages assets on behalf of other segments of the Company. **Global WAM-managed AUMA** is a financial measure equal to the sum of Global WAM's AUMA and assets managed by Global WAM on behalf of other segments. It is an important measure of the assets managed by Global WAM.

AUM and AUMA reconciliations

(Canadian $ in millions, and based on actual foreign exchange rates in effect in the applicable reporting period, unless otherwise stated)

	CAD $						US $(4)	
	December 31, 2022						December 31, 2022	
As at	Asia	Canada	U.S.	Global WAM	Corporate and Other	Total	Asia	U.S.
Total Invested Assets								
Manulife Bank net lending assets	$ –	$ 24,779	$ –	$ –	$ –	$ 24,779	$ –	$ –
Derivative reclassification(1)	–	–	–	–	5,701	5,701	–	–
Invested assets excluding above items	126,267	85,654	154,004	3,717	13,879	383,521	93,179	113,660
Total	126,267	110,433	154,004	3,717	19,580	414,001	93,179	113,660
Segregated funds net assets								
Segregated funds net assets – Institutional	–	–	–	3,719	–	3,719	–	–
Segregated funds net assets – Other(2)	23,226	35,695	65,489	220,473	(40)	344,843	17,138	48,333
Total	23,226	35,695	65,489	224,192	(40)	348,562	17,138	48,333
AUM per financial statements	149,493	146,128	219,493	227,909	19,540	762,563	110,317	161,993
Mutual funds	–	–	–	258,183	–	258,183	–	–
Institutional asset management(3)	–	–	–	109,979	–	109,979	–	–
Other funds	–	–	–	13,617	–	13,617	–	–
Total AUM	149,493	146,128	219,493	609,688	19,540	1,144,342	110,317	161,993
Assets under administration	–	–	–	170,224	–	170,224	–	–
Total AUMA	$ 149,493	$ 146,128	$ 219,493	$ 779,912	$ 19,540	$ 1,314,566	$ 110,317	$ 161,993
Total AUMA, US $(4)						$ 970,196		
Total AUMA	$ 149,493	$ 146,128	$ 219,493	$ 779,912	$ 19,540	$ 1,314,566		
CER adjustment(5)	–	–	–	–	–	–		
Total AUMA, CER basis	$ 149,493	$ 146,128	$ 219,493	$ 779,912	$ 19,540	$ 1,314,566		

Global WAM Managed AUMA	
Global WAM AUMA	$ 779,912
AUM managed by Global WAM for Manulife's other segments	229,534
Total	$ 1,009,446

(1) Corporate and Other consolidation adjustment related to net derivative assets reclassified from total invested assets to other lines on the Statement of Financial Position.

(2) Corporate and Other segregated funds net asset represents elimination of amounts held by the Company.

(3) Institutional asset management excludes Institutional segregated funds net assets.

(4) The impact of updating foreign exchange rates to that which was used in 4Q22.

(5) US $ AUMA is calculated as total AUMA in Canadian $ divided by the US $ exchange rate in effect at the end of the quarter.

	CAD $						US $[4]	
	September 30, 2022						September 30, 2022	
As at	Asia	Canada	U.S.	Global WAM	Corporate and Other	Total	Asia	U.S.
Total Invested Assets								
Manulife Bank net lending assets	$ –	$ 24,637	$ –	$ –	$ –	$ 24,637	$ –	$ –
Derivative reclassification[1]	–	–	–	–	5,880	5,880	–	–
Invested assets excluding above items	121,285	85,164	154,739	3,741	15,846	380,775	88,263	112,615
Total	121,285	109,801	154,739	3,741	21,726	411,292	88,263	112,615
Segregated funds net assets								
Segregated funds net assets – Institutional	–	–	–	4,118	–	4,118	–	–
Segregated funds net assets – Other[2]	22,032	34,773	63,996	210,352	(26)	331,127	16,042	46,575
Total	22,032	34,773	63,996	214,470	(26)	335,245	16,042	46,575
AUM per financial statements	143,317	144,574	218,735	218,211	21,700	746,537	104,305	159,190
Mutual funds	–	–	–	249,520	–	249,520	–	–
Institutional asset management[3]	–	–	–	100,361	–	100,361	–	–
Other funds	–	–	–	12,910	–	12,910	–	–
Total AUM	143,317	144,574	218,735	581,002	21,700	1,109,328	104,305	159,190
Assets under administration	–	–	–	167,759	–	167,759	–	–
Total AUMA	$ 143,317	$ 144,574	$ 218,735	$ 748,761	$ 21,700	$ 1,277,087	$ 104,305	$ 159,190
Total AUMA, US $[4]						$ 929,433		
Total AUMA	$ 143,317	$ 144,574	$ 218,735	$ 748,761	$ 21,700	$ 1,277,087		
CER adjustment[5]	2,236	–	(2,996)	(5,465)	–	(6,225)		
Total AUMA, CER basis	$ 145,553	$ 144,574	$ 215,739	$ 743,296	$ 21,700	$ 1,270,862		

Global WAM Managed AUMA	
Global WAM AUMA	$ 748,761
AUM managed by Global WAM for Manulife's other segments	220,637
Total	$ 969,398

Note: For footnotes (1) to (5), refer to the "AUM and AUMA reconciliation" table as at December 31, 2022 above.

	CAD $						US $(4)	
	June 30, 2022						June 30, 2022	
As at	Asia	Canada	U.S.	Global WAM	Corporate and Other	Total	Asia	U.S.
Total Invested Assets								
Manulife Bank net lending assets	$ –	$ 24,500	$ –	$ –	$ –	$ 24,500	$ –	$ –
Derivative reclassification(1)	–	–	–	–	5,233	5,233	–	–
Invested assets excluding above items	117,128	82,755	149,506	3,967	19,240	372,596	90,822	115,901
Total	117,128	107,255	149,506	3,967	24,473	402,329	90,822	115,901
Segregated funds net assets								
Segregated funds net assets – Institutional	–	–	–	4,098	–	4,098	–	–
Segregated funds net assets – Other(2)	21,874	35,577	64,200	209,181	(27)	330,805	16,953	49,770
Total	21,874	35,577	64,200	213,279	(27)	334,903	16,953	49,770
AUM per financial statements	139,002	142,832	213,706	217,246	24,446	737,232	107,775	165,671
Mutual funds	–	–	–	250,445	–	250,445	–	–
Institutional asset management(3)	–	–	–	100,205	–	100,205	–	–
Other funds	–	–	–	12,110	–	12,110	–	–
Total AUM	139,002	142,832	213,706	580,006	24,446	1,099,992	107,775	165,671
Assets under administration	–	–	–	164,697	–	164,697	–	–
Total AUMA	$ 139,002	$ 142,832	$ 213,706	$ 744,703	$ 24,446	$ 1,264,689	$ 107,775	$ 165,671
Total AUMA, US $(4)						$ 980,379		
Total AUMA	$ 139,002	$ 142,832	$ 213,706	$ 744,703	$ 24,446	$ 1,264,689		
CER adjustment(5)	7,713	–	10,766	27,142	–	45,621		
Total AUMA, CER basis	$ 146,715	$ 142,832	$ 224,472	$ 771,845	$ 24,446	$ 1,310,310		
Global WAM Managed AUMA								
Global WAM AUMA				$ 744,703				
AUM managed by Global WAM for Manulife's other segments				220,103				
Total				$ 964,806				

Note: For footnotes (1) to (5), refer to the "AUM and AUMA reconciliation" table as at December 31, 2022 above.

	CAD $						US $(4)	
	March 31, 2022						March 31, 2022	
As at	Asia	Canada	U.S.	Global WAM	Corporate and Other	Total	Asia	U.S.
Total Invested Assets								
Manulife Bank net lending assets	$ –	$ 24,004	$ –	$ –	$ –	$ 24,004	$ –	$ –
Derivative reclassification(1)	–	–	–	–	(270)	(270)	–	–
Invested assets excluding above items	120,529	88,736	150,989	3,468	21,945	385,667	96,463	120,830
Total	120,529	112,740	150,989	3,468	21,675	409,401	96,463	120,830
Segregated funds net assets								
Segregated funds net assets – Institutional	–	–	–	4,338	–	4,338	–	–
Segregated funds net assets – Other(2)	23,868	39,649	71,823	232,276	(26)	367,590	19,108	57,476
Total	23,868	39,649	71,823	236,614	(26)	371,928	19,108	57,476
AUM per financial statements	144,397	152,389	222,812	240,082	21,649	781,329	115,571	178,306
Mutual funds	–	–	–	274,665	–	274,665	–	–
Institutional asset management(3)	–	–	–	101,105	–	101,105	–	–
Other funds	–	–	–	13,269	–	13,269	–	–
Total AUM	144,397	152,389	222,812	629,121	21,649	1,170,368	115,571	178,306
Assets under administration	–	–	–	178,843	–	178,843	–	–
Total AUMA	$ 144,397	$ 152,389	$ 222,812	$ 807,964	$ 21,649	$ 1,349,211	$ 115,571	$ 178,306
Total AUMA, US $(4)						$ 1,079,714		
Total AUMA	$ 144,397	$ 152,389	$ 222,812	$ 807,964	$ 21,649	$ 1,349,211		
CER adjustment(5)	7,757	–	18,743	46,021	–	72,521		
Total AUMA, CER basis	$ 152,154	$ 152,389	$ 241,555	$ 853,985	$ 21,649	$ 1,421,732		
Global WAM Managed AUMA								
Global WAM AUMA				$ 807,964				
AUM managed by Global WAM for Manulife's other segments				231,373				
Total				$ 1,039,337				

Note: For footnotes (1) to (5), refer to the “AUM and AUMA reconciliation” table as at December 31, 2022 above.

	CAD $						US $[4]	
	December 31, 2021						December 31, 2021	
As at	Asia	Canada	U.S.	Global WAM	Corporate and Other	Total	Asia	U.S.
Total Invested Assets								
Manulife Bank net lending assets	$ –	$ 23,447	$ –	$ –	$ –	$ 23,447	$ –	$ –
Derivative reclassification[1]	–	–	–	–	(7,475)	(7,475)	–	–
Invested assets excluding above items	129,207	96,425	164,830	4,458	16,206	411,126	101,893	130,013
Total	129,207	119,872	164,830	4,458	8,731	427,098	101,893	130,013
Segregated funds net assets								
Segregated funds net assets – Institutional	–	–	–	4,470	–	4,470	–	–
Segregated funds net assets – Other[2]	25,505	42,124	79,620	248,097	(28)	395,318	20,112	62,801
Total	25,505	42,124	79,620	252,567	(28)	399,788	20,112	62,801
AUM per financial statements	154,712	161,996	244,450	257,025	8,703	826,886	122,005	192,814
Mutual funds	–	–	–	290,863	–	290,863	–	–
Institutional asset management[3]	–	–	–	106,407	–	106,407	–	–
Other funds	–	–	–	14,001	–	14,001	–	–
Total AUM	154,712	161,996	244,450	668,296	8,703	1,238,157	122,005	192,814
Assets under administration	–	–	–	187,631	–	187,631	–	–
Total AUMA	$ 154,712	$ 161,996	$ 244,450	$ 855,927	$ 8,703	$ 1,425,788	$ 122,005	$ 192,814
Total AUMA, US $[4]						$ 1,124,616		
Total AUMA	$ 154,712	$ 161,996	$ 244,450	$ 855,927	$ 8,703	$ 1,425,788		
CER adjustment[5]	4,276	–	16,771	38,313	–	59,360		
Total AUMA, CER basis	$ 158,988	$ 161,996	$ 261,221	$ 894,240	$ 8,703	$ 1,485,148		
Global WAM Managed AUMA								
Global WAM AUMA				$ 855,927				
AUM managed by Global WAM for Manulife's other segments				246,773				
Total				$ 1,102,700				

Note: For footnotes (1) to (5), refer to the "AUM and AUMA reconciliation" table as at December 31, 2022 above.

Global WAM AUMA and Managed AUMA by business line and geographic source

As at	**Dec 31, 2022**	Sept 30, 2022	Jun 30, 2022	Mar 31, 2022	Dec 31, 2021
Global WAM AUMA by business line					
Retirement	**$ 394,388**	$ 379,687	$ 377,674	$ 412,689	$ 440,831
Retail	**270,416**	263,106	261,354	289,008	303,232
Institutional asset management	**115,108**	105,968	105,675	106,267	111,864
Total	**$ 779,912**	$ 748,761	$ 744,703	$ 807,964	$ 855,927
Global WAM AUMA by business line, CER basis(1)					
Retirement	**$ 394,388**	$ 375,529	$ 392,572	$ 439,827	$ 464,527
Retail	**270,416**	261,428	269,750	303,381	314,992
Institutional asset management	**115,108**	106,339	109,523	110,777	114,721
Total	**$ 779,912**	$ 743,296	$ 771,845	$ 853,985	$ 894,240
Global WAM AUMA by geographic source					
Asia	**$ 109,800**	$ 97,083	$ 96,510	$ 98,608	$ 104,584
Canada	**212,553**	203,988	206,073	227,252	238,798
U.S.	**457,559**	447,690	442,120	482,104	512,545
Total	**$ 779,912**	$ 748,761	$ 744,703	$ 807,964	$ 855,927
Global WAM AUMA by geographic source, CER basis(1)					
Asia	**$ 109,800**	$ 97,837	$ 101,373	$ 103,986	$ 107,675
Canada	**212,553**	203,988	206,073	227,252	238,798
U.S.	**457,559**	441,471	464,399	522,747	547,767
Total	**$ 779,912**	$ 743,296	$ 771,845	$ 853,985	$ 894,240
Global WAM Managed AUMA by business line					
Retirement	**$ 394,388**	$ 379,687	$ 377,674	$ 412,689	$ 440,831
Retail	**347,658**	336,459	335,367	370,999	391,911
Institutional asset management	**267,400**	253,252	251,765	255,649	269,958
Total	**$ 1,009,446**	$ 969,398	$ 964,806	$ 1,039,337	$ 1,102,700
Global WAM Managed AUMA by business line, CER basis(1)					
Retirement	**$ 394,388**	$ 375,529	$ 392,572	$ 439,827	$ 464,527
Retail	**347,658**	334,149	346,083	389,656	407,471
Institutional asset management	**267,400**	251,857	261,945	270,967	282,185
Total	**$ 1,009,446**	$ 961,535	$ 1,000,600	$ 1,100,450	$ 1,154,183
Global WAM Managed AUMA by geographic source					
Asia	**$ 209,111**	$ 192,004	$ 190,301	$ 195,346	$ 207,827
Canada	**260,899**	251,603	254,400	279,700	293,902
U.S.	**539,436**	525,791	520,105	564,291	600,971
Total	**$ 1,009,446**	$ 969,398	$ 964,806	$ 1,039,337	$ 1,102,700
Global WAM Managed AUMA by geographic source, CER basis(1)					
Asia	**$ 209,111**	$ 191,445	$ 199,884	$ 208,887	$ 218,010
Canada	**260,899**	251,603	254,400	279,700	293,902
U.S.	**539,436**	518,487	546,316	611,863	642,271
Total	**$ 1,009,446**	$ 961,535	$ 1,000,600	$ 1,100,450	$ 1,154,183

(1) AUMA adjusted to reflect the foreign exchange rates for the Statement of Financial Position in effect for 4Q22.

Average assets under management and administration ("average AUMA") is 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 WAM 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. Similarly, Global WAM **average managed AUMA and average AUA** are the average of Global WAM's managed AUMA and AUA, respectively, and are calculated in a manner consistent with average AUMA.

Manulife Bank net lending assets is a financial measure equal to the sum of Manulife Bank's loans and mortgages, net of allowances. **Manulife Bank average net lending assets** is a financial measure which is calculated as the quarter-end average of the opening and the ending balance of net lending assets. Both of these financial measures are a measure of the size of Manulife Bank's portfolio of loans and mortgages and are used to analyze and explain its earnings.

As at ($ millions)	**Dec 31, 2022**	Sept 30, 2022	Jun 30, 2022	Mar 31, 2022	Dec 31, 2021
Mortgages	**$ 54,638**	$ 54,685	$ 53,422	$ 52,287	$ 52,014
Less: mortgages not held by Manulife Bank	**32,640**	32,847	31,704	30,950	31,073
Total mortgages held by Manulife Bank	**21,998**	21,838	21,718	21,337	20,941
Loans to bank clients	**2,781**	2,799	2,782	2,667	2,506
Manulife Bank net lending assets	**$ 24,779**	$ 24,637	$ 24,500	$ 24,004	$ 23,447
Manulife Bank average net lending assets					
Beginning of period	**$ 24,637**	$ 24,500	$ 24,004	$ 23,447	$ 23,139
End of period	**24,779**	24,637	24,500	24,004	23,447
Manulife Bank average net lending assets by quarter	**$ 24,708**	$ 24,569	$ 24,252	$ 23,726	$ 23,293
Manulife Bank average net lending assets – full year	**$ 24,113**				$ 23,105

Consolidated capital serves as a foundation of our capital management activities at the MFC level. Consolidated capital is calculated as the sum of: (i) total equity excluding accumulated other comprehensive income ("AOCI") on cash flow hedges; and (ii) certain other capital instruments that qualify as regulatory capital. For regulatory reporting purposes under the LICAT framework, the numbers are further adjusted for various additions or deductions to capital as mandated by the guidelines defined by OSFI.

As at ($ millions)	**Dec 31, 2022**	Sep 30, 2022	Jun 30, 2022	Mar 31, 2022	Dec 31, 2021
Total equity	**$ 56,379**	$ 56,307	$ 55,798	$ 56,849	$ 58,869
Exclude AOCI gain/(loss) on cash flow hedges	**8**	(18)	(48)	(70)	(156)
Total equity excluding AOCI on cash flow hedges	**56,371**	56,325	55,846	56,919	59,025
Qualifying capital instruments	**6,122**	7,118	7,001	6,950	6,980
Consolidated capital	**$ 62,493**	$ 63,443	$ 62,847	$ 63,869	$ 66,005

Core EBITDA is a financial 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.

Reconciliation of Global WAM core earnings to core EBITDA and Global WAM core EBITDA by business line and geographic source

($ millions, pre-tax and based on actual foreign exchange rates in effect in the applicable reporting period, unless otherwise stated)	Quarterly Results					Full Year Results	
	4Q22	3Q22	2Q22	1Q22	4Q21	**2022**	2021
Global WAM core earnings (post-tax)	**$ 267**	$ 345	$ 305	$ 324	$ 387	**$ 1,241**	$ 1,406
Addback taxes, acquisition costs, other expenses and deferred sales commissions							
Core income tax (expense) recovery (see above)	**50**	50	57	61	52	**218**	234
Acquisition costs, other expenses	**89**	86	80	81	79	**336**	323
Deferred sales commissions	**23**	23	25	24	25	**95**	99
Core EBITDA	**$ 429**	$ 504	$ 467	$ 490	$ 543	**$ 1,890**	$ 2,062
CER adjustment(1)	**–**	11	17	21	25	**49**	91
Core EBITDA, CER basis	**$ 429**	$ 515	$ 484	$ 511	$ 568	**$ 1,939**	$ 2,153
Core EBITDA by business line							
Retirement	**$ 268**	$ 287	$ 263	$ 277	$ 306	**$ 1,095**	$ 1,210
Retail	**170**	193	179	201	220	**743**	790
Institutional asset management	**(9)**	24	25	12	17	**52**	62
Total	**$ 429**	$ 504	$ 467	$ 490	$ 543	**$ 1,890**	$ 2,062
Core EBITDA by geographic source							
Asia	**$ 97**	$ 111	$ 106	$ 113	$ 115	**$ 427**	$ 511
Canada	**143**	180	171	171	185	**665**	682
U.S.	**189**	213	190	206	243	**798**	869
Total	**$ 429**	$ 504	$ 467	$ 490	$ 543	**$ 1,890**	$ 2,062
Core EBITDA by business line, CER basis(2)							
Retirement	**$ 268**	$ 296	$ 274	$ 292	$ 324	**$ 1,130**	$ 1,286
Retail	**170**	195	183	208	226	**756**	803
Institutional asset management	**(9)**	24	27	11	18	**53**	64
Total, CER basis	**$ 429**	$ 515	$ 484	$ 511	$ 568	**$ 1,939**	$ 2,153
Core EBITDA by geographic source, CER basis(2)							
Asia	**$ 97**	$ 114	$ 111	$ 119	$ 121	**$ 441**	$ 529
Canada	**143**	180	171	171	185	**665**	682
U.S.	**189**	221	202	221	262	**833**	942
Total, CER basis	**$ 429**	$ 515	$ 484	$ 511	$ 568	**$ 1,939**	$ 2,153

(1) The impact of updating foreign exchange rates to that which was used in 4Q22.

(2) Core EBITDA adjusted to reflect the foreign exchange rates for the Statement of Income in effect for 4Q22.

Core EBITDA margin is a financial 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 core revenue from these businesses. **Core revenue** is used to calculate our core EBITDA margin, and is equal to pre-tax revenue included in core EBITDA, and it excludes such items as revenue related to integration and acquisitions. 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.

($ millions, unless otherwise stated)	Quarterly Results					Full Year Results	
	4Q22	3Q22	2Q22	1Q22	4Q21	**2022**	2021
Core EBITDA margin							
Core EBITDA	**$ 429**	$ 504	$ 467	$ 490	$ 543	**$ 1,890**	$ 2,062
Global WAM core revenue	**$ 1,572**	$ 1,542	$ 1,521	$ 1,586	$ 1,727	**$ 6,221**	$ 6,541
Core EBITDA margin	**27.3%**	32.7%	30.7%	30.9%	31.4%	**30.4%**	31.5%
Global WAM Revenue	**$ 1,662**	$ 1,542	$ 1,521	$ 1,586	$ 1,727	**$ 6,311**	$ 6,541
Less: Revenue reported in items excluded from core earnings							
Revenue related to integration and acquisitions	**90**	–	–	–	–	**90**	–
Global WAM core revenue	**$ 1,572**	$ 1,542	$ 1,521	$ 1,586	$ 1,727	**$ 6,221**	$ 6,541

Expense efficiency ratio is a financial measure which Manulife uses to measure progress towards our target to be more efficient. It is defined as core general expenses divided by the sum of core earnings before income taxes ("pre-tax core earnings") and core general expenses. **Core general expenses** is used to calculate our expense efficiency ratio and is equal to pre-tax general expenses included in core earnings and excludes such items as material legal provisions for settlements, restructuring charges and expenses related to integration and acquisitions.

($ millions, and based on actual foreign exchange rates in effect in the applicable reporting period, unless otherwise stated)	Quarterly Results					Full Year Results		
	4Q22	3Q22	2Q22	1Q22	4Q21	**2022**	2021	2017[2]
Expense Efficiency Ratio								
Core general expenses	**$ 2,122**	$ 1,859	$ 1,843	$ 1,877	$ 1,973	**$ 7,701**	$ 7,553	$ 7,091
Core earnings (pre-tax)	**2,048**	1,593	1,900	1,876	2,054	**7,417**	7,896	5,702
Total – Core earnings (pre-tax) and Core general expenses	**$ 4,170**	$ 3,452	$ 3,743	$ 3,753	$ 4,027	**$ 15,118**	$ 15,449	$ 12,793
Expense Efficiency Ratio	**50.9%**	53.9%	49.2%	50.0%	49.0%	**50.9%**	48.9%	55.4%
Core general expenses								
General expenses – Financial Statements	**$ 2,141**	$ 1,900	$ 1,843	$ 1,898	$ 2,000	**$ 7,782**	$ 7,828	$ 7,233
Less: General expenses included in items excluded from core earnings								
Restructuring charge	**–**	–	–	–	–	**–**	150	–
Integration and acquisition	**18**	–	–	8	–	**26**	–	81
Legal provisions and Other expenses	**1**	41	–	13	27	**55**	125	61
Total	**$ 19**	$ 41	$ –	$ 21	$ 27	**$ 81**	$ 275	$ 142
Core general expenses	**$ 2,122**	$ 1,859	$ 1,843	$ 1,877	$ 1,973	**$ 7,701**	$ 7,553	$ 7,091
Core general expenses	**$ 2,122**	$ 1,859	$ 1,843	$ 1,877	$ 1,973	**$ 7,701**	$ 7,553	
CER adjustment[1]	**–**	40	49	41	49	**130**	186	
Core general expenses, CER basis	**$ 2,122**	$ 1,899	$ 1,892	$ 1,918	$ 2,022	**$ 7,831**	$ 7,739	

[1] The impact of updating foreign exchange rates to that which was used in 4Q22.

[2] The 2017 comparative period is presented due to its inclusion in Section 1 "Strategic priorities progress update" above.

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 business excludes our Global WAM, Manulife Bank and Property and Casualty Reinsurance businesses.

Net annualized fee income yield on average AUMA ("Net fee income yield") is a financial measure that represents the net annualized fee income from Global WAM channels over average AUMA. This measure provides information on Global WAM's adjusted return generated from managing AUMA.

Net annualized fee income is a financial measure that represents Global WAM income before income taxes, adjusted to exclude items unrelated to net fee income, including general expenses, investment income, non-AUMA related net benefits and claims, and net premium taxes. It also excludes the components of Global WAM net fee income from managing assets on behalf of other segments. This measure is annualized based on the number of days in the year divided by the number of days in the reporting period.

Reconciliation of income before income taxes to net fee income yield

	Quarterly Results					Full Year Results	
($ millions, unless otherwise stated)	**4Q22**	3Q22	2Q22	1Q22	4Q21	**2022**	2021
Income before income taxes	**$ 2,142**	$ 1,637	$ 1,257	$ 3,711	$ 2,481	**$ 8,747**	$ 8,125
Less: Income before income taxes for segments other than Global WAM	**1,739**	1,242	895	3,325	2,043	**7,201**	6,484
Global WAM income before income taxes	**403**	395	362	386	438	**1,546**	1,641
Items unrelated to net fee income	**564**	565	580	600	616	**2,309**	2,324
Global WAM net fee income	**967**	960	942	986	1,054	**3,855**	3,965
Less: Net fee income from other segments	**110**	112	112	118	122	**452**	458
Global WAM net fee income excluding net fee income from other segments	**857**	848	830	868	932	**3,403**	3,507
Net annualized fee income	**$ 3,400**	$ 3,362	$ 3,328	$ 3,516	$ 3,698	**$ 3,403**	$ 3,507
Average Assets under Management and Administration	**$ 777,772**	$ 771,812	$ 776,833	$ 820,393	$ 835,494	**$ 787,842**	$ 798,022
Net fee income yield (bps)	**43.7**	43.6	42.8	42.9	44.3	**43.2**	43.9

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 P&C 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 P&C 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.

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 the first quarter of 2013, subsequent deposits into existing U.S. variable annuity contracts are not reported as sales. Asia variable annuity deposits are included in APE sales.

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

Gross flows is a new business measure presented for our Global WAM business and includes all deposits into mutual funds, 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, group pension/retirement savings products, private wealth and institutional asset management products. In addition, net flows include the net flows of exchange traded funds and non-proprietary product sold by Manulife Securities. 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 net flows are positive, they are referred to as net inflows. Conversely, negative net flows are referred to as net outflows.

Market value to book value ratio is calculated as the market value of one common share of the Company divided by the book value of a common share. It is a key valuation measure used by the market for our common shares.

Remittances is defined as the cash remitted or available for distribution to the Manulife 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.

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, 2022, 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)	$ **8,702**	$ **195**	$ **390**	$ **2,950**	$ **5,167**
Liabilities for capital instruments(1)	**8,706**	**239**	**1,095**	**566**	**6,806**
Investment commitments	**14,193**	**4,454**	**5,122**	**4,029**	**588**
Lease liabilities	**420**	**112**	**154**	**93**	**61**
Insurance contract liabilities(2)	**1,054,970**	**11,498**	**12,365**	**18,496**	**1,012,611**
Investment contract liabilities(1)	**4,690**	**300**	**511**	**514**	**3,365**
Deposits from Bank clients	**22,507**	**16,884**	**3,000**	**2,623**	**–**
Other	**6,180**	**2,011**	**2,104**	**2,011**	**54**
Total contractual obligations	$ **60,708**	$ **23,895**	$ **11,865**	$ **12,272**	$ **12,676**

(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, 2023 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, 2022 and is assumed to remain constant to the final contractual maturity date. The Company may have the contractual right to redeem or repay obligations prior to maturity and if such right is exercised, total contractual obligations paid and the timing of payment could vary significantly from the amounts and timing included in the table.

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

Legal and Regulatory Proceedings

We are regularly involved in legal actions, both as a defendant and as a plaintiff. Information on legal and regulatory proceedings can be found in note 19 of the 2022 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, 2022**	Sept 30, 2022	Jun 30, 2022	Mar 31, 2022	Dec 31, 2021	Sept 30, 2021	Jun 30, 2021	Mar 31, 2021
Revenue								
Premium income								
Life and health insurance	**$ 8,469**	$ 8,710	$ 8,783	$ 9,521	$ 9,159	$ 9,269	$ 8,716	$ 8,986
Annuities and pensions(1)	**783**	762	844	(19)	901	714	698	622
Net premium income	**9,252**	9,472	9,627	9,502	10,060	9,983	9,414	9,608
Investment income	**4,232**	3,883	3,675	3,417	4,350	3,964	4,099	3,214
Realized and unrealized gains and losses on assets supporting insurance and investment contract liabilities(2)	**(822)**	(7,955)	(17,760)	(18,540)	4,460	(958)	9,551	(17,056)
Other revenue	**2,739**	2,377	2,057	1,991	2,741	2,994	2,760	2,637
Total revenue	**$ 15,401**	$ 7,777	$ (2,401)	$ (3,630)	$ 21,611	$ 15,983	$ 25,824	$ (1,597)
Income (loss) before income taxes	**$ 2,142**	$ 1,637	$ 1,257	$ 3,711	$ 2,481	$ 1,480	$ 3,292	$ 872
Income tax (expense) recovery	**(166)**	(332)	(258)	(809)	(430)	(166)	(610)	(7)
Net income (loss)	**$ 1,976**	$ 1,305	$ 999	$ 2,902	$ 2,051	$ 1,314	$ 2,682	$ 865
Net income (loss) attributed to shareholders	**$ 1,891**	$ 1,347	$ 1,086	$ 2,970	$ 2,084	$ 1,592	$ 2,646	$ 783
Basic earnings (loss) per common share	**$ 0.95**	$ 0.68	$ 0.53	$ 1.51	$ 1.04	$ 0.80	$ 1.33	$ 0.38
Diluted earnings (loss) per common share	**$ 0.95**	$ 0.68	$ 0.53	$ 1.50	$ 1.03	$ 0.80	$ 1.33	$ 0.38
Segregated funds deposits	**$ 10,165**	$ 9,841	$ 10,094	$ 12,328	$ 10,920	$ 10,929	$ 10,301	$ 12,395
Total assets (in billions)	**$ 849**	$ 835	$ 821	$ 865	$ 918	$ 898	$ 879	$ 859
Weighted average common shares (in millions)	**1,878**	1,902	1,921	1,938	1,943	1,942	1,942	1,941
Diluted weighted average common shares (in millions)	**1,881**	1,904	1,924	1,942	1,946	1,946	1,946	1,945
Dividends per common share	**$ 0.330**	$ 0.330	$ 0.330	$ 0.330	$ 0.330	$ 0.280	$ 0.280	$ 0.280
CDN$ to US$1 – Statement of Financial Position	**1.3549**	1.3740	1.2900	1.2496	1.2678	1.2741	1.2394	1.2575
CDN$ to US$1 – Statement of Income	**1.3575**	1.3057	1.2765	1.2663	1.2601	1.2602	1.2282	1.2660

(1) Includes lower net premium income related to the reinsurance of a block of our legacy U.S. variable annuity business of US$0.9 billion in 1Q22.

(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.

Selected Annual Financial Information

As at and for the years ended December 31, ($ millions, except per share amounts)	**2022**	2021	2020
Revenue			
Asia	**$ 14,962**	$ 29,571	$ 28,455
Canada	**3,907**	12,366	18,638
U.S.	**(6,829)**	13,256	23,361
Global Wealth and Asset Management	**6,311**	6,541	5,749
Corporate and Other	**(1,204)**	87	2,705
Total revenue	**$ 17,147**	$ 61,821	$ 78,908
Total assets	**$ 848,941**	$ 917,643	$ 880,349
Long-term financial liabilities			
Long-term debt	**$ 6,234**	$ 4,882	$ 6,164
Capital instruments	**6,122**	6,980	7,829
Total financial liabilities	**$ 12,356**	$ 11,862	$ 13,993
Dividend per common share	**$ 1.32**	$ 1.17	$ 1.12
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	**0.5870**	0.5658	0.5445
Cash dividend per Class 1 Share, Series 4	**0.6814**	0.3814	0.587
Cash dividend per Class 1 Share, Series 5(1)	**–**	0.9728	0.9728
Cash dividend per Class 1 Share, Series 7(3)	**0.2695**	1.078	1.078
Cash dividend per Class 1 Share, Series 9	**1.1894**	1.0878	1.0878
Cash dividend per Class 1 Share, Series 11	**1.1828**	1.1828	1.1828
Cash dividend per Class 1 Share, Series 13	**1.1035**	1.1035	1.1035
Cash dividend per Class 1 Share, Series 15	**0.9465**	0.9465	0.9465
Cash dividend per Class 1 Share, Series 17	**0.950**	0.950	0.950
Cash dividend per Class 1 Share, Series 19	**0.9188**	0.9188	0.9266
Cash dividend per Class 1 Share, Series 21(2)	**–**	0.70	1.40
Cash dividend per Class 1 Share, Series 23(4)	**0.3031**	1.2125	1.2125
Cash dividend per Class 1 Share, Series 25	**1.175**	1.175	1.175

(1) MFC redeemed in full the Class 1 Series 5 preferred shares at par, on December 19, 2021, the earliest redemption date.
(2) MFC redeemed in full the Class 1 Series 21 preferred shares at par, on June 19, 2021, the earliest redemption date.
(3) MFC redeemed in full the Class 1 Series 7 preferred shares at par, on March 19, 2022, the earliest redemption date.
(4) MFC redeemed in full the Class 1 Series 23 preferred shares at par, on March 19, 2022, the earliest redemption date.

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, 2022, 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, 2023, MFC had 1,858,186,149 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.