

2019 Embedded Value Report for Manulife's Insurance¹ Businesses

(Excludes the value of in-force business for Wealth and Asset Management, Bank and Property and Casualty Reinsurance businesses)

¹ Includes variable and fixed annuities, and single premium products sold in Asia

Overview:

Manulife Financial Corporation (the “Company” or “Manulife”) generated New Business Value (“NBV”) of \$2,050 million in 2019, up \$302 million or 15%¹ from 2018. In addition, NBV margin increased to 35.5% in 2019 from 32.9% in 2018. The increase in NBV and NBV margin was largely driven by strong sales growth in Hong Kong, Asia Other and the U.S.

Manulife’s Embedded Value (“EV”) was \$58.1 billion, or \$29.79 per share, as at December 31, 2019, an increase of \$2.5 billion from the EV as at December 31, 2018. Contributions from in-force and new business increased EV by \$7.4 billion or 13% from December 31, 2018. Currency movements and the payment of shareholder dividends decreased EV.

Background:

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 the Company. It does not include any value associated with future new business. The change in EV between reporting periods is used by Manulife’s management as a measure of the value created by the Company’s operations in the reporting period. NBV is the change in EV due to sales in the reporting period. EV, NBV, and NBV margin are non-GAAP financial measures. A financial measure is considered a non-GAAP measure for Canadian securities law purposes if it is presented other than in accordance with generally accepted accounting principles used for the Company’s audited financial statements. Non-GAAP financial measures are not defined terms under GAAP and, therefore, are unlikely to be comparable to similar terms used by other issuers. Therefore, they should not be considered in isolation or as a substitute for any other financial information prepared in accordance with GAAP. For more information on non-GAAP financial measures, including those referred to above, see “Performance and Non-GAAP Measures” in our 2019 Management’s Discussion and Analysis.

We use a traditional deterministic discounted cash flow methodology for determining our EV and NBV. This methodology makes implicit allowance for all material sources of risk embedded in our products using a risk-adjusted discount rate. It should be noted that this allowance for risk is approximate and may not correspond with the allowance determined using market consistent techniques.

The calculation of EV and NBV necessarily requires several assumptions with respect to future experience. Future experience may vary from that assumed in the calculation, which may materially impact EV and NBV. See “Caution regarding forward-looking statements” below.

¹ Growth in NBV is stated on a constant currency basis.

Willis Towers Watson Review Opinion on Embedded Value

Manulife and its subsidiaries have prepared EV results for the year ended December 31, 2019. The EV results, together with a description of the methodology and assumptions that have been used, were shown in the “2019 Embedded Value Report for Manulife’s Insurance Businesses (excludes the value of in-force business for Wealth and Asset Management, Bank and Property and Casualty Reinsurance businesses)”.

Our scope of work covered:

- a review of methodology and assumptions used to determine the EV results for the year ended 2019, and the NBV for 2019, and
- a review of the results of Manulife’s calculation of the EV results.

Willis Towers Watson has concluded that:

- the methodology used for the North American and Asian business is consistent with recent industry practice in each respective region as regards to traditional embedded value calculations based on discounted values of projected deterministic after-tax cash flows. This methodology makes an overall allowance for risk for the company using risk discount rates which incorporate risk margins which vary by business, together with an explicit allowance for the cost of holding required capital. Willis Towers Watson has not considered how this compares to a capital markets valuation of such risk (so called “market consistent valuation”),
- the economic assumptions used have made allowance for the Company’s current and expected future asset mix and investment strategy and are internally consistent, and
- the operating assumptions have been set with appropriate regard to past, current and expected future experience, considering the nature of the business.

Willis Towers Watson has performed a number of high-level checks on the results of the calculations, without undertaking detailed checks on the models and processes involved, and has confirmed that no issues have been discovered that have a material impact on the disclosed EV as at December 31, 2019, the NBV for the twelve-month period January 1, 2019 to December 31, 2019, the analysis of movement in EV for the twelve-month period December 31, 2018 to December 31, 2019, or the sensitivity analysis.

Sudden unforeseen events such as the COVID-19 pandemic can have significant impacts on the level of economic activity, investment markets and Manulife’s business and its experience. In forming our opinion on the future expected experience, we have not directly considered the potential impact including volatility on Manulife’s business, the investment markets or the industry of such events, including COVID-19, unless and only to the extent that such potential impact is specifically described in the Embedded Value Report.

Embedded Value Results

Embedded Value Summary

As at December 31, (C\$ millions)	2019	2018
Adjusted net worth excluding holding company activities ⁽¹⁾	\$ 46,489	\$ 45,519
Present value of future profits	\$ 44,589	\$ 43,658
Cost of capital	(17,526)	(16,274)
Value of in-force business ⁽²⁾	\$ 27,063	\$ 27,384
Holding company activities		
Carrying value of debt and preferred shares	\$ (15,485)	\$ (17,323)
Embedded value	\$ 58,067	\$ 55,580

⁽¹⁾ The adjusted net worth shown above reflects the equity for the Company, adjusted for the items listed under the reconciliation of shareholders' equity to adjusted net worth.

⁽²⁾ The value of in-force business excludes the Wealth and Asset Management ("WAM"), Manulife Bank of Canada ("Bank") and Property and Casualty ("P&C") Reinsurance businesses.

As at December 31, 2019, Manulife's EV was \$58.1 billion, an increase of \$2.5 billion from December 31, 2018. In-force and new business movement contributed \$7.4 billion to EV. This increase in EV was primarily due to the interest on the prior year's EV, and NBV which increased by 15%¹ compared to NBV for the year ended December 31, 2018 as well as current period earnings from the Wealth and Asset Management ("WAM"), Manulife Bank of Canada ("Bank") and Property and Casualty ("P&C") Reinsurance businesses. Currency, common shareholder dividends, other capital movements and the impact of the reinsurance transactions resulted in a net decrease in EV of \$4.9 billion. The largest drivers were currency, due to the depreciation of the U.S. dollar, Hong Kong dollar and Japanese yen compared with the Canadian dollar, and the normal course payment of common shareholder dividends.

Embedded Value Movement

For the year ended December 31, (C\$ millions)	2019	2018
Embedded value as at January 1	\$ 55,580	\$ 49,216
Impact of restatement ⁽¹⁾	-	(1,482)
Restated embedded value as of January 1	55,580	47,734
Current period earnings from WAM, Bank and P&C Reinsurance businesses ^{(2), (3)}	1,340	1,265
Interest on embedded value	4,536	3,892
New business value	2,050	1,748
Changes in investment assumptions and investment experience ⁽⁴⁾	495	209
Changes in operating assumptions and operating experience	(683)	(262)
Unallocated overhead expenses ⁽⁵⁾	(366)	(355)
Embedded value after contributions from in-force and new business	\$ 62,952	\$ 54,231
Impact of reinsurance transactions	\$ 102	\$ (226)
Currency	(2,324)	3,794
Common shareholder dividends	(1,965)	(1,802)
Other capital movements ⁽⁶⁾	(698)	(417)
Embedded value as at December 31	\$ 58,067	\$ 55,580

⁽¹⁾ The restatement impact in 2018 reflects a \$(1.4) billion impact of replacing MCCR with LICAT as well as a \$(0.1) billion impact related to a reclass of certain group annuities business in Canada to Wealth and Asset Management.

⁽²⁾ The value of in-force business excludes WAM, Bank and P&C Reinsurance businesses. As a result, the current period earnings from WAM, Bank and P&C Reinsurance businesses contribute to the total embedded value movement.

⁽³⁾ P&C Reinsurance business refers to our property and casualty reinsurance business.

⁽⁴⁾ Changes in investment assumptions and investment experience includes changes in the fair value adjustments made for the Company's long-term debt, preferred shares and surplus assets.

⁽⁵⁾ Unallocated overhead expenses include both Group unallocated expenses and Asia regional office unallocated expenses.

⁽⁶⁾ Includes share issues and repurchases, option exercises, preferred share dividends and DRIP.

¹ Growth in NBV is stated on a constant currency basis.

Embedded Value Components by Segment

As at December 31, 2019 (C\$ millions)	Asia	Canada	U.S.	Corporate and Other ⁽¹⁾	Total
Required capital ⁽²⁾	\$ 3,714	\$ 8,830	\$ 12,705	\$ 135	\$ 25,384
Allocated surplus ⁽²⁾	4,514	3,241	5,087	8,263	21,105
Adjusted net worth excluding holding company activities ⁽³⁾	\$ 8,228	\$ 12,071	\$ 17,792	\$ 8,398	\$ 46,489
Present value of future profits	\$ 17,386	\$ 8,983	\$ 18,169	\$ 51	\$ 44,589
Cost of capital	(1,783)	(5,803)	(9,905)	(35)	(17,526)
Value of in-force business ⁽⁴⁾	\$ 15,603	\$ 3,180	\$ 8,264	\$ 16	\$ 27,063
Embedded value excluding holding company activities	\$ 23,831	\$ 15,251	\$ 26,056	\$ 8,414	\$ 73,552
Holding company activities					
Carrying value of debt and preferred shares					\$ (15,485)
Total embedded value					\$ 58,067

⁽¹⁾ Adjusted net worth related to the Global WAM reporting segment is grouped with Corporate and Other.

⁽²⁾ Required capital is based on the required capital ratios as outlined in the "Assumptions" section below. The allocated surplus by segment is based on our capital ratio operating range for each territory in Asia, Canada and the U.S., with the remainder allocated to Corporate and Other.

⁽³⁾ The adjusted net worth excluding holding company activities shown above reflects the equity for the Company, adjusted for the items listed under the reconciliation of shareholders' equity to adjusted net worth.

⁽⁴⁾ The value of in-force business excludes WAM, Bank and P&C Reinsurance businesses.

Reconciliation of Shareholders' Equity to Adjusted Net Worth

As at December 31, 2019 (C\$ millions)	2019	2018
Common Shareholders' equity on Consolidated Statements of Financial Position	\$ 45,316	\$ 42,142
Carrying value of debt and preferred shares	15,485	17,323
Fair value adjustments ⁽¹⁾	50	501
Goodwill and intangibles ⁽²⁾	(9,250)	(9,406)
Impact of differences between IFRS and statutory values of insurance and investment contract liabilities and assets in Asia ⁽³⁾	(5,112)	(5,041)
Adjusted net worth excluding holding company activities	\$ 46,489	\$ 45,519

⁽¹⁾ Fair value adjustments are made for the Company's long-term debt, and preferred shares, which are measured at amortized cost under IFRS reporting and fair value for EV reporting. Adjustments are also made for certain surplus assets which are measured at amortized cost under IFRS reporting but fair value for EV reporting.

⁽²⁾ Goodwill and intangible assets are a component of IFRS adjusted net worth; however, they are excluded from EV, net of deferred tax.

⁽³⁾ This adjustment represents the difference between adjusted net worth for our Asian businesses as measured under IFRS for Canadian insurance companies, and adjusted net worth for our Asian businesses as measured under the relevant local statutory accounting bases.

Projected After-tax Discounted Distributable Earnings

(C\$ millions)	Discounted Amount
December 31, 2019	\$ 5,620
2020 – 2024	15,373
2025 – 2029	12,811
2030 – 2034	8,704
2035 – 2039	6,318
2040 and later	9,241
Total embedded value	\$ 58,067

The discounted distributable earnings value as at December 31, 2019 represents allocated surplus, net of holding company activities, as of the valuation date. The remaining discounted distributable earnings values are expected to emerge after the valuation date. Distributable earnings for Canada and the U.S. reflect IFRS reserving requirements for Canadian insurance companies and LICAT required capital. Distributable earnings for Asia reflect local regulatory reserving and capital requirements. The sum of the discounted distributable earnings equals the total EV as at December 31, 2019.

New Business Value Results

(C\$ millions)	New Business Value ⁽¹⁾				APE ⁽²⁾				New Business Value Margin ⁽³⁾			
	2020 Q1	2019 Q1	2019	2018	2020 Q1	2019 Q1	2019	2018	2020 Q1	2019 Q1	2019	2018
Canada	\$ 77	\$ 62	\$ 237	\$ 207	\$ 376	\$ 261	\$ 1,057	\$ 975	20.5%	23.8%	22.4%	21.2%
U.S.	36	46	218	98	141	143	702	553	25.5%	32.4%	31.0%	17.8%
Hong Kong	165	131	711	543	268	220	1,139	840	61.6%	59.5%	62.4%	64.6%
Japan	57	153	343	427	220	544	1,109	1,410	25.9%	28.2%	30.9%	30.3%
Asia Other	134	127	541	473	469	460	1,757	1,541	28.6%	27.6%	30.8%	30.7%
Asia	356	411	1,595	1,443	957	1,224	4,005	3,791	37.2%	33.6%	39.8%	38.1%
Total ⁽⁴⁾	\$ 469	\$ 519	\$ 2,050	\$ 1,748	\$ 1,474	\$ 1,628	\$ 5,764	\$ 5,319	31.8%	31.9%	35.5%	32.9%

⁽¹⁾ Starting Q1 2020, the NBV methodology for Asia was refined to reflect the average interest rates over the quarter, instead of the end of quarter rates.

⁽²⁾ Annualized Premium Equivalent ("APE") is calculated as 100% of annualized first year premiums for recurring premium products, and as 10% of single premiums for single premium products and wealth management products. APE displayed here excludes non-controlling interest and does not include the WAM or Bank businesses.

⁽³⁾ New Business Value ("NBV") margin is calculated as NBV divided by APE excluding non-controlling interest and is a non-GAAP measure.

⁽⁴⁾ NBV does not include WAM, Bank and P&C Reinsurance businesses.

In 2019 Manulife's NBV increased by 15%¹ compared with 2018. This increase was primarily driven by strong sales growth in Hong Kong, Asia Other and the U.S. In Asia, NBV increased 8%¹ from 2018 to \$1.6 billion due to growth in Hong Kong and Asia Other, partially offset by a decline in Japan sales. Canada NBV increased 14% to \$237 million due to higher individual insurance sales. U.S. NBV increased 119%¹ to \$218 million primarily as a result of recent actions to improve margins, as well as higher sales and a more favourable product mix. The total NBV margin increased from 32.9% in 2018 to 35.5% in 2019.

New business value ("NBV") was \$469 million in 1Q20, a decrease of 11%¹ compared with 1Q19. In Asia, NBV decreased 14%¹ to \$356 million compared with 1Q19 as growth in Hong Kong and Asia Other was more than offset by a decline in Japan. In Canada, NBV of \$77 million was up 24% from 1Q19, driven by higher sales across all business lines. In the U.S., NBV of \$36 million was down 23%¹ from 1Q19, primarily due to the impact of lower sales volumes and less favourable business mix.

¹ Growth in NBV is stated on a constant currency basis.

Potential Impact on Embedded Value and New Business Value Arising from Changes in Assumptions

The following table outlines the potential impact on EV at December 31, 2019, and NBV for the year ended December 31, 2019 of changes in the assumptions used for EV and NBV, respectively.

This includes sensitivities due to specific changes in market prices and interest rate levels projected using internal models as at a specific date. The sensitivities measure the impact of changing one factor at a time and assume that all other factors remain unchanged. For example, the discount rate, public equity return, and alternative long-duration asset (“ALDA”) return remain unchanged when we test a 50 basis points (“bps”) increase or decrease in fixed income market yields. 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 investment return and future investment activity assumptions; changes in business mix, effective tax rates and other market factors; and the general limitations of our internal models.

The potential impact on EV of changes in assumptions includes impacts due to changes in adjusted net worth, the present value of expected future earnings, and the present value of the cost of holding capital to support the in-force business. The potential impact on NBV of changes in assumptions includes impacts due to changes in the present value of expected future earnings on new business, and the present value of the cost of holding capital to support new business. We reflected a change in reserve assumptions only where the assumptions are set with reference to current market rates. This applies to the change in fixed income market yield in Canada, the U.S. and some Asia territories.

These estimates assume that the performance of the dynamic hedging program for a 50 bps change in fixed income market yields, and a 10% immediate change in public equity and ALDA market values would not completely offset the gain/loss from the dynamically hedged variable annuity guarantee liabilities. They assume 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. For variable annuity guarantee liabilities that are dynamically hedged, it is assumed that interest rate hedges are rebalanced at 20 basis point intervals.

The sensitivities should only be viewed as directional estimates of the underlying sensitivities for the respective factors based on the changes in assumptions outlined below. Given the nature of these calculations, we cannot provide assurance that the actual impact on EV or NBV will be as indicated.

Potential Impact on Embedded Value Arising from Changes in Assumptions ^{(1), (2)}

As at December 31, 2019					
(C\$ millions)	Canada	U.S.	Asia	Corporate and Other	Total
Embedded Value excluding holding company activities	\$ 15,251	\$ 26,056	\$ 23,831	\$ 8,414	\$ 73,552
Carrying value of debt and preferred shares					(15,485)
Total Embedded Value					58,067
Potential impact on Embedded Value of changes in assumptions:					
100 bps increase in discount rate	\$ (1,408)	\$ (2,300)	\$ (1,419)	\$ -	\$ (5,127)
100 bps decrease in discount rate	1,754	2,766	1,695	-	6,215
50 bps increase in fixed income market yields for all future years	525	(637)	515	(341)	62
50 bps decrease in fixed income market yields for all future years	(501)	871	(1,088)	385	(333)
100 bps increase in public equity and ALDA returns ⁽³⁾	1,582	1,486	1,055	-	4,123
100 bps decrease in public equity and ALDA returns ⁽³⁾	(1,563)	(2,103)	(1,120)	-	(4,786)
10% immediate increase in public equity and ALDA market values ⁽³⁾	1,164	2,108	1,054	64	4,390
10% immediate decrease in public equity and ALDA market values ⁽³⁾	(1,219)	(2,185)	(1,057)	(64)	(4,525)
Required surplus – relative 25% increase ⁽⁴⁾	(1,964)	(3,923)	(796)	-	(6,683)

⁽¹⁾ For general fund adjustable benefit products subject to minimum rate guarantee, the sensitivities assume that credited rates are floored at the minimum.

⁽²⁾ The EV sensitivities include impacts from both adjusted net worth, where applicable, and the value of in-force business. The adjusted net worth is affected by the 50 bps changes in fixed income market yields, which causes changes in the fair value of fixed income assets held, and by the 10% immediate increase and decrease in public equity and ALDA market values.

⁽³⁾ ALDA include commercial real estate, power and infrastructure, timber and farmland real estate, oil and gas, and private equities.

⁽⁴⁾ This shows the impact of increasing required capital levels by a relative 25% above those shown in the assumptions table below. For businesses subject to LICAT, this was modeled as 125% Base Solvency Buffer – Surplus Allowance.

The potential impact on EV of changes in public equity and ALDA returns, and public equity and ALDA market values, is lower in Asia than other segments primarily due to the lower use of ALDA and the higher proportion of participating business.

Potential Impact on New Business Value Arising from Changes in Assumptions ^{(1), (2)}

(C\$ millions)	Canada	U.S.	Japan	Hong Kong	Asia Other	Total
New Business Value for the period January 1 to December 31, 2019	\$ 237	\$ 218	\$ 343	\$ 711	\$ 541	\$ 2,050
100 bps increase in discount rate	\$ (39)	\$ (17)	\$ (51)	\$ (66)	\$ (60)	\$ (233)
100 bps decrease in discount rate	46	22	62	78	74	282
50 bps increase in fixed income market yields for all future years	12	18	56	70	39	195
50 bps decrease in fixed income market yields for all future years	(13)	(18)	(61)	(108)	(42)	(242)
100 bps increase in public equity and ALDA return ⁽³⁾	4	8	22	39	21	94
100 bps decrease in public equity and ALDA return ⁽³⁾	(4)	(5)	(21)	(38)	(21)	(89)
10% immediate increase in public equity and ALDA market values ⁽³⁾	5	10	-	18	11	44
10% immediate decrease in public equity and ALDA market values ⁽³⁾	(6)	(10)	-	(18)	(11)	(45)
Required surplus – relative 25% increase ⁽⁴⁾	(32)	(59)	(24)	(16)	(24)	(155)

⁽¹⁾ For general fund adjustable benefit products subject to minimum rate guarantee, the sensitivities assume that credited rates are floored at the minimum.

⁽²⁾ For the purpose of NBV sensitivities, assumption changes have been assumed to occur after the point-of-sale. Therefore, the NBV sensitivity gives an indication of how the NBV written during the year would have been affected by an economic shock occurring after the point-of-sale. NBV sensitivities consider hedging strategies on new business which are intended to be implemented shortly after sale. Actual changes in NBV due to experience being different from assumed may vary from what is shown above due to changes in product mix.

⁽³⁾ ALDA include commercial real estate, timber and farmland real estate, oil and gas, and private equities.

⁽⁴⁾ This shows the impact of increasing required capital levels by a relative 25% above those shown in the assumptions table below. For businesses subject to LICAT, this was modeled as 125% Base Solvency Buffer – Surplus Allowance.

The potential impact of changes in fixed income market rates for all future years is relatively higher for NBV than EV. This occurs because invested assets partially mitigate exposure to changes in fixed income market yields, and EV has relatively higher invested assets than NBV.

Methodology

The value of in-force business and NBV do not include the Wealth and Asset Management (“WAM”), Bank or Property and Casualty Reinsurance businesses. The adjusted net worth includes all of Manulife’s equity, adjusted for the items listed under the reconciliation of shareholders’ equity to adjusted net worth.

The value of in-force business has been calculated using the financial position of the Company as at December 31, 2019.

The EV is 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 our Asian businesses.

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 Life Insurance Capital Adequacy Test (“LICAT”) framework. The value of in-force business in Asia reflects local statutory earnings and capital requirements.

NBV is the change in EV due to sales in the reporting period. NBV is calculated as the present value of shareholders’ interests in the expected future distributable earnings on new business, less the present value of the cost of holding capital as calculated under the LICAT framework in Canada and the U.S., and the local capital requirements in Asia.

Investment assumptions are consistent with the Company’s best estimate assumptions reflected in the valuation of policy liabilities, updated to reflect market assumptions consistent with the market environment in the quarter the business was sold. Best estimate fixed income yields are updated quarterly, and long-term expected yields for ALDA are typically reviewed during the annual review of actuarial methods and assumptions.

Assumptions

The principal economic assumptions used in the EV calculation as at December 31, 2019, and the NBV calculation for the year ended December 31, 2019 were:

Principal Economic Assumptions as at December 31, 2019

Territory	Canada	U.S.	Japan	Hong Kong
Required capital	100% LICAT ⁽¹⁾	100% LICAT ⁽¹⁾	400% solvency margin	150% solvency margin
Discount rate	7.50%	8.25%	5.75%	9.00%
Public equity return	8.80%	9.80%	6.00%	9.50%
Jurisdictional income tax rate ⁽²⁾	26.50%	21.00%	28.00%	16.50%
Reinvestment assumption for 10-year government bonds:				
Immediate	1.70%	1.92%	-0.03%	1.78%
10 years in future	1.84%	2.45%	0.59%	1.83%
20 years in future	3.28%	3.56%	1.88%	2.82%
30 years in future	3.79%	3.99%	2.43%	3.17%
Ultimate Reinvestment Rate	4.79%	4.79%	3.44%	4.10%

⁽¹⁾ 100% of LICAT Required Capital = 100% Base Solvency Buffer – Surplus Allowance

⁽²⁾ For Hong Kong, individual insurance products are taxed on a premium tax basis due to a Company election under Hong Kong tax regulations.

Assumption	Additional information
Required Capital:	The capital ratios in jurisdictions not included in the table above are as follows: Mainland China 100% of required capital as specified under China Association of Actuaries EV assessment guidance Indonesia 120% of regulatory risk-based capital requirement Malaysia 160% of regulatory capital adequacy ratio The Philippines 125% of regulatory risk-based capital requirement Singapore 160% of regulatory capital adequacy ratio Vietnam 100% of required minimum solvency margin
Discount rate:	A risk-adjusted discount rate is used which is based on the risk profile of the business and makes an allowance for all material sources of risk embedded in our products, the risk that actual experience in future years differs from that assumed, and for the economic cost of capital. The discount rate is set based on our target equity/debt structure, which assumes that 25% of the capital is in the form of debt.
Public equity returns:	The equity return assumptions are based on long-term historical observed experience. The return assumptions for public equity in Asia excluding Hong Kong and Japan vary between 8.5% and 9.5%.
Risk-free interest rates:	The risk-free interest rates are based on forward interest rates implied by the equilibrium risk-free market curve at December 31, 2019. The rates transition to the long-term risk-free interest rates over a 60-year period. The long-term risk-free interest rates were developed in accordance with Canadian actuarial standards of practice.
Expenses:	Expenses are allocated to acquisition of new business and maintenance of in-force business and are derived based on internal cost studies. Expenses are then projected into the future with an allowance for inflation. Where certain expenses were identified as being non-recurring and distinct in nature these expenses were excluded from the analysis. Unallocated Group office and Asia regional office expenses are charged to EV as incurred.
Exchange rates:	The foreign exchange rate used for the translation of EV results at December 31, 2018 and 2019 are the respective year-end statements of financial position rates. The foreign exchange rates used for translation of the NBV results each quarter are the respective quarterly statements of income rates.
Other assumptions:	For the EV calculation, other operating assumptions such as mortality, morbidity, lapses and expenses are consistent with best estimate assumptions used in the valuation of insurance and investment contract liabilities as at December 31, 2019 on

Assumption	Additional information
	an IFRS basis. For the quarterly NBV calculation, these other operating assumptions are consistent with the best estimate assumptions used in the valuation of insurance and investment contract liabilities for each quarter on an IFRS basis. Local statutory earnings in Asia are calculated using assumptions as required under the local reserving bases.

The principal economic assumptions used in the EV calculation as at December 31, 2018, and the NBV for the year ended December 31, 2018 were:

Principal Economic Assumptions as at December 31, 2018

Territory	Canada	U.S.	Japan	Hong Kong
Required Capital	100% LICAT ⁽¹⁾	100% LICAT ⁽¹⁾	400% solvency margin	150% solvency margin
Discount rate	7.5%	8.25%	5.75%	9.2%
Public equity return	8.8%	9.8%	6.0%	9.5%
Jurisdictional income tax rate ⁽²⁾	26.75%	21%	28.00%	16.5% ⁽²⁾
Reinvestment assumption for 10-year government bonds				
Immediate	1.97%	2.69%	-0.01%	2.02%
10 years in future	2.38%	3.07%	1.03%	2.26%
20 years in future	3.56%	3.95%	2.10%	3.03%
30 years in future	4.04%	4.29%	2.64%	3.33%

⁽¹⁾ 100% of LICAT Required Capital = 100% Base Solvency Buffer – Surplus Allowance.

⁽²⁾ For Hong Kong, individual insurance products are taxed on a premium tax basis due to a Company election under Hong Kong tax regulations.

Caution regarding forward-looking statements

This report contains forward-looking statements within the “safe harbor” provisions of Canadian provincial securities laws and the U.S. Private Securities Litigation Reform Act of 1995.

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.

Certain material factors or assumptions are applied in making forward-looking statements, including the assumptions described in this report, and actual results may differ materially from those expressed or implied in such statements.

Important factors that could cause actual results to differ materially from expectations include but are not limited to: general business and economic conditions (including but not limited to the performance, volatility and correlation of equity markets, interest rates, credit and swap spreads, currency rates, investment losses and defaults, market liquidity and creditworthiness of guarantors, reinsurers and counterparties); changes in laws and regulations; changes in accounting standards applicable in any of the territories in which we operate; changes in regulatory capital requirements; our ability to execute strategic plans and changes to strategic plans; downgrades in our insurance subsidiaries financial strength or credit ratings; our ability to maintain our reputation; 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 EV and NBV 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; 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 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; acquisitions and our ability to complete acquisitions including the availability of equity and debt financing for this purpose; the failure to realize some or all of the expected benefits of the acquisitions; the disruption of or changes to key elements of the Company’s or public infrastructure systems; environmental concerns; and our ability to protect our intellectual property and exposure to claims of infringement. We do not undertake to update any forward-looking statements, except as required by law.