2018 Embedded Value Report for Manulife's Insurance[1] 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 $1,748 million in 2018, up $305 million or 20%[1] from 2017. In addition, NBV margin increased to 32.9% in 2018 from 26.2% in 2017. The growth in NBV and NBV margin was largely driven by higher sales, scale benefits, and an improved product mix in Asia.

Manulife's Embedded Value ("EV") was $55.6 billion as at December 31, 2018, an increase of $7.9 billion from the EV as at December 31, 2017[(2)]. Contributions from in-force and new business increased EV by $6.5 billion or 14% from December 31, 2017. Currency movements also increased EV but this was partially offset by the payment of shareholder dividends.

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 2018 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.

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

[2] The 2017 EV was restated to reflect the Life Insurance Capital Adequacy Test ("LICAT") framework, which replaced the Minimum Continuing Capital and Surplus Requirements ("MCCSR") framework in North America as of January 1, 2018, as well as to reflect the impact of a reclass of certain group annuities business in Canada to Wealth and Asset Management. The impact of the LICAT restatement was $(1.4) billion and the impact from the reclass was $(0.1) billion. The decrease in EV due to LICAT was driven by a higher Cost of Capital, the result of higher required capital for risks with slower run-off, such as ALDA, and a faster run-off of required capital credits, such as the provisions for adverse deviations (PfADs) on insurance risks.

Willis Towers Watson Review Opinion on Embedded Value

Manulife and its subsidiaries have prepared EV results for the year ended December 31, 2018. The EV results, together with a description of the methodology and assumptions that have been used, were shown in the "2018 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 2018, and the NBV for 2018, 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 through the use of 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, taking into account 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, 2018, the NBV for the twelve-month period January 1, 2018 to December 31, 2018, the analysis of movement in EV for the twelve-month period December 31, 2017 to December 31, 2018, or the sensitivity analysis.

Embedded Value Results

Embedded Value Summary

As at December 31, (C$ millions)		**2018**		2017[(1)]
Adjusted net worth excluding holding company activities (2)	**$**	**45,519**	$	40,746
Present value of future profits	**$**	**43,658**	$	40,451
Cost of capital		**(16,274)**		(16,714)
Value of in-force business (3)	**$**	**27,384**	$	23,737
Holding company activities				
Carrying value of debt and preferred shares	**$**	**(17,323)**	$	(16,749)
Embedded value	**$**	**55,580**	$	47,734

(1) The 2017 figures were restated to reflect a $(1.4) billion impact of replacing MCCSR 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 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.

(3) 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, 2018, Manulife's EV was $55.6 billion, an increase of $7.9 billion from Manulife's restated EV as at December 31, 2017. In-force and new business movement contributed $6.5 billion to EV. This increase in EV was primarily due to the interest on the prior year's EV, and NBV which increased by 20%[1] compared to NBV for the year ended December 31, 2017 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 annuity coinsurance transactions resulted in a net increase in EV of $1.4 billion. Currency was the largest driver due to the appreciation of the U.S. dollar, Hong Kong dollar and Japanese yen compared with the Canadian dollar, partially offset by the normal course payment of common shareholder dividends.

Embedded Value Movement

For the year ended December 31, (C$ millions)		**2018**		2017
Embedded value as at January 1	**$**	**49,216**	$	46,444
Impact of restatement (1)		**(1,482)**		-
Restated embedded value as of January 1		**47,734**		46,444
Current period earnings from WAM, Bank and P&C Reinsurance businesses (3), (4)		**1,265**		788
Interest on embedded value		**3,892**		3,871
New business value		**1,748**		1,443
Changes in investment assumptions and investment experience (5)		**209**		(544)
Changes in operating assumptions and operating experience (2)		**(262)**		2,173
Unallocated overhead expenses (6)		**(355)**		(380)
Embedded value after contributions from in-force and new business	**$**	**54,231**	$	53,795
Impact of annuity coinsurance transactions	**$**	**(226)**	$	-
Currency		**3,794**		(2,916)
Common shareholder dividends		**(1,802)**		(1,621)
Other capital movements (7)		**(417)**		(42)
Embedded value as at December 31	**$**	**55,580**	$	49,216

(1) The restatement impact reflects a $(1.4) billion impact of replacing MCCSR 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) Changes in operating assumptions and operating experience includes the impact from the U.S. Tax Reform.

(3) 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.

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

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

(5) 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 asset as well as the impact of our decision to reduce the allocation to alternative long-duration assets ("ALDA") in our portfolio asset mix supporting our North American legacy businesses at year end 2017.

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

(7) Includes share issues and repurchases, option exercises, preferred share dividends and DRIP. The increase over the prior year was primarily due to the 23 million share repurchases for $478 million in 2018.

Embedded Value Components by Segment (1)

As at December 31, 2018 (C$ millions)	Asia	Canada	U.S.	Corporate and Other (1)	**Total**
Required capital (2)	$ 4,768	$ 7,995	$ 12,230	$ 87	**$ 25,080**
Allocated surplus (2)	4,814	2,924	4,956	7,745	**20,439**
Adjusted net worth excluding holding company activities (3)	$ 9,582	$ 10,919	$ 17,186	$ 7,832	**$ 45,519**
Present value of future profits	$ 16,230	$ 8,747	$ 18,627	$ 54	**$ 43,658**
Cost of capital	(1,852)	(5,141)	(9,272)	(9)	**(16,274)**
Value of in-force business (3)	$ 14,378	$ 3,606	$ 9,355	$ 45	**$ 27,384**
Embedded value excluding holding company activities	$ 23,960	$ 14,525	$ 26,541	$ 7,877	**$ 72,903**
Holding company activities					
Carrying value of debt and preferred shares					**$ (17,323)**
Total embedded value					**$ 55,580**

(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, (C$ millions)	**2018**	2017
Common Shareholders' equity on Consolidated Statements of Financial Position	**$ 42,142**	$ 37,436
Carrying value of debt and preferred shares	**17,323**	16,749
Fair value adjustments (1)	**501**	(557)
Goodwill and intangibles (2)	**(9,406)**	(9,157)
Impact of differences between IFRS and statutory values of insurance and investment contract liabilities and assets in Asia (3)	**(5,041)**	(3,725)
Adjusted net worth excluding holding company activities	**$ 45,519**	$ 40,746

(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. The positive adjustment in 2018 is mainly due to the decrease in the fair value of debt and preferred shares.

(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. The adjustment increased during 2018 primarily due to limits on the capitalization of the economic value of new business in actuarial liabilities under the local reserve basis in Vietnam and Japan, as well as the statutory impact of equity market movements in Hong Kong.

Projected After-tax Discounted Distributable Earnings

(C$ millions)	Discounted Amount
December 31, 2018	$ 3,116
2018 – 2022	15,552
2023 – 2027	12,607
2028 – 2032	8,497
2033 – 2037	6,435
2038 and later	9,374
Total embedded value	$ 55,580

The discounted distributable earnings value as at December 31, 2018 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, 2018.

New Business Value Results

	New Business Value				APE (1)				New Business Value Margin (2)			
(C$ millions)	**2019 Q1**	2018 Q1	**2018**	2017	**2019 Q1**	2018 Q1	**2018**	2017	**2019 Q1**	2018 Q1	**2018**	2017
Canada	**$ 62**	$ 49	**$ 207**	$ 191	**$ 261**	$ 290	**$ 975**	$ 1,366	**23.8%**	17.0%	**21.2%**	14.0%
U.S.	**46**	$ 10	**98**	51	**143**	113	**553**	603	**32.4%**	8.9%	**17.8%**	8.5%
Hong Kong	**131**	116	**543**	448	**220**	188	**840**	756	**59.5%**	61.8%	**64.6%**	59.2%
Japan	**153**	94	**427**	390	**544**	325	**1,410**	1,435	**28.2%**	29.0%	**30.3%**	27.2%
Other Asia	**127**	114	**473**	363	**460**	393	**1,541**	1,339	**27.6%**	29.1%	**30.7%**	27.1%
Asia	411	325	**1,443**	1,201	1,224	906	**3,791**	3,530	33.6%	35.9%	**38.1%**	34.0%
Total (3)	**$ 519**	$ 384	**$ 1,748**	$1,443	**$ 1,628**	$ 1,310	**$ 5,319**	$ 5,499	**31.9%**	29.4%	**32.9%**	26.2%

(1) 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.

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

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

In 2018 Manulife's NBV increased by 20%[1] compared with 2017. This increase was primarily driven by Asia due to both strong sales growth and increased margins. In Asia, NBV increased 19% from 2017 to $1.4 billion due to higher sales, scale benefits and a favourable business mix. Canada NBV increased 8% to $207 million as the benefits from the launch of Manulife Par and product repricing were partially offset by lower group insurance sales. U.S. NBV increased 90% to $98 million driven by product repricing to improve margins. The total NBV margin increased from 26.2% in 2017 to 32.9% in 2018.

New business value ("NBV") $519 million in 1Q19, an increase of 31% compared with 1Q18. In Asia, NBV increased 23% to $411 million driven by higher sales, partially offset by a less favourable business mix. In Canada, NBV increased 27% to $62 million driven by the new Manulife Par product. In the U.S., NBV more than quadrupled to $46 million primarily due to actions to improve margins and a more 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, 2018, and NBV for the year ended December 31, 2018 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, 2018 (C$ millions)	Canada	U.S.	Asia	Corporate and Other	**Total**
Embedded Value excluding holding company activities	**$ 14,525**	**$ 26,541**	**$ 23,960**	**$ 7,877**	**$ 72,903**
Carrying value of debt and preferred shares					(17,323)
Total Embedded Value					**55,580**
Potential impact on Embedded Value of changes in assumptions:					
100 bps increase in discount rate	$ (1,366)	$ (2,317)	$ (1,364)	$ -	$ (5,047)
100 bps decrease in discount rate	1,695	2,794	1,646	-	6,135
50 bps increase in fixed income market yields for all future years	582	21	292	(364)	531
50 bps decrease in fixed income market yields for all future years	(704)	204	(766)	410	(856)
100 bps increase in public equity and ALDA returns [3]	1,411	1,261	1,003	-	3,675
100 bps decrease in public equity and ALDA returns [3]	(1,320)	(2,103)	(979)	-	(4,402)
10% immediate increase in public equity and ALDA market values [4]	1,079	2,280	914	134	4,407
10% immediate decrease in public equity and ALDA market values [4]	(1,109)	(2,313)	(929)	(136)	(4,487)
Required surplus – relative 25% increase [4]	(1,682)	(3,656)	(742)	-	(6,080)

[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 high 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, 2018	**$ 207**	**$ 98**	**$ 427**	**$ 543**	**$ 473**	**$ 1,748**
100 bps increase in discount rate	$ (37)	$ (18)	$ (63)	$ (50)	$ (48)	$ (216)
100 bps decrease in discount rate	44	24	75	58	56	257
50 bps increase in fixed income market yields for all future years	14	11	71	40	21	157
50 bps decrease in fixed income market yields for all future years	(12)	(11)	(76)	(62)	(27)	(188)
100 bps increase in public equity and ALDA return [3]	5	7	17	30	11	70
100 bps decrease in public equity and ALDA return [3]	(4)	(3)	(17)	(29)	(11)	(64)
10% immediate increase in public equity and ALDA market values [4]	7	8	-	20	10	45
10% immediate decrease in public equity and ALDA market values [4]	(7)	(7)	-	(25)	(10)	(49)
Required surplus – relative 25% increase [4]	(34)	(36)	(36)	(13)	(25)	(144)

(1) For general fund adjustable benefit products subject to minimum rate guarantee, the sensitivities are based on the assumption 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 take into account 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, 2018.

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, 2018, and the NBV calculation 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	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.

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 — 200% 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 public equity return assumptions 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, 2018. 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, 2017 and 2018 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, 2018 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, 2017, and the NBV for the year ended December 31, 2017 were:

Principal Economic Assumptions as at December 31, 2017

	Canada	U.S.	Japan	Hong Kong
Capital ratio	150% MCCSR	150% MCCSR	400% solvency margin	150% solvency margin
Discount rate	7.5%	8.25%	5.75%	9.50%
Equity return	8.8%	9.8%	6.0%	10.0%
Income tax rate (1)	26.75%	35% / 21% (1)	28.00%	16.5% (2)
Reinvestment assumption for 10-year government bonds				
Immediate	2.06%	2.41%	0.04%	1.81%
10 years in future	2.44%	2.79%	1.12%	2.66%
20 years in future	3.60%	3.79%	2.14%	3.16%
30 years in future	4.06%	4.19%	2.67%	3.43%

(1) The NBV calculation for the year ended December 31, 2017 reflects a U.S. corporate tax rate of 35%. The EV calculation as at December 31, 2017 reflects the reduction of the U.S. corporate tax rate to 21%, effective January 1, 2018.

(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.

The forward-looking statements in this document include, but are not limited to, statements with respect to the expected impact of our decision to reduce the allocation to alternative long-duration assets ("ALDA") in our portfolio asset mix supporting our legacy business and of U.S. Tax Reform, as well as projections and statements regarding future experience.

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: the final interpretation of U.S. Tax Reform by tax authorities, the amount of time required to reduce the allocation to ALDA in our asset mix and redeploy capital towards higher-return businesses, the specific type of ALDA we dispose of and the value realized from such dispositions; 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.