

# 2016 Embedded Value Report for Manulife's Insurance and Other Wealth Businesses

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

Dated May 3, 2017

## Overview:

Manulife Financial Corporation (the “Company” or “Manulife”) generated New Business Value (“NBV”) of \$1,226 million in 2016, up \$271 million or 22%<sup>1</sup> from 2015. In addition, NBV margin increased to 25.7% in 2016 from 23.5% in 2015. The growth in NBV and NBV margin was driven by strong sales growth and improved product margins in Asia.

Manulife’s Embedded Value (“EV”) was \$46.5 billion as at December 31, 2016, a decrease of \$1.3 billion from 2015. Contributions from inforce and new business increased EV by \$2.9 billion or 6% from 2015. This was more than offset by the impact of currency movements, the payment of shareholder dividends and the impact of acquisitions and distribution agreements completed in 2016 through the exclusion of goodwill and intangibles from 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 as a result of 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 2016 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 through the use of 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 a number of 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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<sup>1</sup> 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, 2016. The EV results, together with a description of the methodology and assumptions that have been used, were shown in the "2016 Embedded Value Report for Manulife's Insurance and Other Wealth 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 2016, and the NBV for 2016 and the first quarter of 2017, 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, 2016, the NBV for the twelve-month period January 1, 2016 to December 31, 2016, the NBV for the three-month period January 1, 2017 to March 31, 2017, the analysis of movement in EV for the twelve-month period December 31, 2015 to December 31, 2016, or the sensitivity analysis.

## Embedded Value Results

### Embedded Value Summary

As at December 31, (C\$ millions)	2016	2015
<b>Adjusted net worth excluding holding company activities<sup>(1)</sup></b>	<b>\$ 42,269</b>	<b>\$ 39,957</b>
Present value of future profits	\$ 37,031	\$ 35,652
Cost of capital	(16,373)	(15,608)
<b>Value of in-force business<sup>(2)</sup></b>	<b>\$ 20,658</b>	<b>\$ 20,044</b>
<b>Holding company activities</b>		
Carrying value of debt and preferred shares	\$ (16,453)	\$ (12,241)
<b>Embedded value</b>	<b>\$ 46,474</b>	<b>\$ 47,760</b>

<sup>(1)</sup> 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.

<sup>(2)</sup> 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, 2016, Manulife's EV was \$46.5 billion, a decrease of \$1.3 billion from Manulife's EV as at December 31, 2015. EV before acquisitions and distribution agreements, currency and capital movements increased by \$2.9 billion, reflecting the contributions of inforce and new business to EV movement. This increase was primarily due to the interest on the prior year's EV and the EV created by new business, which increased by 22%<sup>1</sup> compared to the EV created by new business for the year ended December 31, 2015, partially offset by the impact of interest rates and market movements, the 3Q16 review of actuarial methods and assumptions, unfavourable policyholder experience during the year and the impact of regulatory capital changes in China and the Philippines. Acquisitions and distribution agreements, currency and capital movements decreased EV by \$4.2 billion, primarily due to the depreciation of the U.S. dollar and Hong Kong dollar compared with the Canadian dollar, the normal course payment of common shareholder dividends, and the impact of acquisitions and distribution agreements completed in 2016 through the exclusion of goodwill and intangibles from EV.

### Embedded Value Movement

For the year ended December 31, (C\$ millions)	2016	2015
Embedded value as at January 1	\$ 47,760	\$ 39,392
Current period earnings from WAM, Bank and P&C Reinsurance businesses <sup>(1),(2)</sup>	811	792
Interest on embedded value	3,875	3,384
New business value	1,226	955
Changes in investment assumptions and investment experience <sup>(3)</sup>	(1,832)	(426)
Changes in operating assumptions and operating experience	(823)	(859)
Unallocated overhead expenses <sup>(4)</sup>	(354)	(295)
<b>Embedded value before acquisitions and distribution agreements, currency and capital movements</b>	<b>\$ 50,663</b>	<b>\$ 42,943</b>
Impact of acquisitions and distribution agreements	\$ (1,008)	\$ (2,515)
Currency	(1,686)	6,496
Common shareholder dividends	(1,435)	(1,301)
Other capital movements <sup>(5)</sup>	(60)	2,137
<b>Embedded value as at December 31</b>	<b>\$ 46,474</b>	<b>\$ 47,760</b>

<sup>(1)</sup> 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.

<sup>(2)</sup> P&C Reinsurance business refers to our property and casualty reinsurance business.

<sup>(3)</sup> Includes changes in the fair value adjustments made for the Company's long-term debt, preferred shares and surplus assets.

<sup>(4)</sup> Unallocated overhead expenses include both Group unallocated expenses and Asia regional office unallocated expenses.

<sup>(5)</sup> Includes share issues, option exercises and preferred share dividends.

<sup>1</sup> Growth in NBV is stated on a constant currency basis.

During 2016 the Company acquired Standard Chartered's Mandatory Provident Fund ("MPF") and Occupational Retirement Schemes Ordinance ("ORSO") businesses in Hong Kong and Transamerica's broker-dealer business in the U.S. In addition, the Company launched a 15-year exclusive distribution partnership with Standard Chartered in Hong Kong and a 15-year regional distribution agreement with DBS Bank Ltd. ("DBS") in Singapore, Hong Kong, Indonesia and mainland China. These acquisitions and distribution agreements resulted in a decrease in EV of \$1 billion, as EV excludes goodwill and intangibles. New business arising from these acquisitions and distribution agreements will contribute to new business value generation and earnings generation for WAM businesses in future years.

### Embedded Value Components by Division

As at December 31, 2016 (C\$ millions)	Asia	Canada	U.S.	Corporate and Other	Total
Required capital <sup>(1)</sup>	\$ 4,173	\$ 8,186	\$ 15,927	\$ 145	\$ 28,431
Allocated surplus <sup>(1)</sup>	3,296	3,051	5,585	1,906	13,838
<b>Adjusted net worth excluding holding company activities<sup>(2)</sup></b>	<b>\$ 7,469</b>	<b>\$ 11,237</b>	<b>\$ 21,512</b>	<b>\$ 2,051</b>	<b>\$ 42,269</b>
Present value of future profits	\$ 11,887	\$ 9,541	\$ 15,553	\$ 50	\$ 37,031
Cost of capital	(1,778)	(4,415)	(10,135)	(45)	(16,373)
<b>Value of in-force business<sup>(3)</sup></b>	<b>\$ 10,109</b>	<b>\$ 5,126</b>	<b>\$ 5,418</b>	<b>\$ 5</b>	<b>\$ 20,658</b>
<b>Embedded value excluding holding company activities</b>	<b>\$ 17,578</b>	<b>\$ 16,363</b>	<b>\$ 26,930</b>	<b>\$ 2,056</b>	<b>\$ 62,927</b>
<b>Holding company activities</b>					
Carrying value of debt and preferred shares					\$ (16,453)
<b>Total embedded value</b>					<b>\$ 46,474</b>

<sup>(1)</sup> Required capital is based on the required capital ratios as outlined in the "Assumptions" section below. The allocated surplus by division 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.

<sup>(2)</sup> 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.

<sup>(3)</sup> 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)	2016	2015
Common Shareholders' equity on Consolidated Statements of Financial Position	\$ 38,255	\$ 38,466
Carrying value of debt and preferred shares <sup>(1)</sup>	16,453	12,241
Fair value adjustments <sup>(2)</sup>	(130)	65
Goodwill and intangibles <sup>(3)</sup>	(9,196)	(8,393)
Impact of differences between IFRS and statutory values of insurance and investment contract liabilities and assets in Asia <sup>(4)</sup>	(3,113)	(2,422)
<b>Adjusted net worth excluding holding company activities</b>	<b>\$ 42,269</b>	<b>\$ 39,957</b>

<sup>(1)</sup> The carrying value of debt and preferred shares increased during 2016 primarily due to the issuance of \$4,021 million of long-term debt and \$884 million of preferred shares.

<sup>(2)</sup> 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 surplus assets which are measured at amortized cost under IFRS reporting but fair value for EV reporting. The adjustment decreased during 2016 primarily due to the increase in the fair value of long-term debt.

<sup>(3)</sup> Goodwill and intangible assets are a component of IFRS adjusted net worth; however, they are excluded from EV, net of deferred tax. Acquisitions and the commencement of distribution agreements in 2016 contributed \$1,008 million to the year end 2016 goodwill and intangible assets.

<sup>(4)</sup> 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 2016 primarily due to the impact of changes in fixed income rates on the local reserve basis in Hong Kong.

## Projected After-tax Discounted Distributable Earnings

(C\$ millions)	Discounted Amount
December 31, 2016	\$ (2,615)
2017 – 2021	16,240
2022 – 2026	12,471
2027 – 2031	7,538
2032 – 2036	5,112
2037 and later	7,728
<b>Total embedded value</b>	<b>\$ 46,474</b>

The discounted distributable earnings value as at December 31, 2016 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 MCCR 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, 2016.

## New Business Value Results

(C\$ millions)	New Business Value				APE <sup>(1)</sup>				New Business Value margin <sup>(3)</sup>			
	2017	2016	2016	2015	2017	2016	2016	2015	2017	2016	2016	2015
	Q1	Q1			Q1	Q1			Q1	Q1		
Canada	\$ 66	\$ 47	\$ 169	\$ 188	\$ 374	\$ 249	\$ 1,015	\$ 1,185	17.7%	19.0%	16.7%	15.8%
U.S.	2	\$ 19	59	76	150	167	609	625	1.3%	11.5%	9.7%	12.1%
Asia												
Hong Kong	94	67	368	335	179	149	655	503	52.1%	44.9%	56.1%	66.5%
Japan	141	96	345	255	439	361	1,350	1,152	32.2%	26.5%	25.5%	22.2%
Other Asia	91	58	285	101	322	256	1,137	592	28.4%	22.6%	25.1%	17.2%
<b>Total<sup>(2)</sup></b>	<b>\$ 394</b>	<b>\$ 287</b>	<b>\$ 1,226</b>	<b>\$ 955</b>	<b>\$ 1,464</b>	<b>\$ 1,182</b>	<b>\$ 4,766</b>	<b>\$ 4,057</b>	<b>26.9%</b>	<b>24.3%</b>	<b>25.7%</b>	<b>23.5%</b>

<sup>(1)</sup> 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.

<sup>(2)</sup> NBV does not include WAM, Bank and P&C Reinsurance businesses.

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

For the year ended December 31, 2016, Manulife's NBV increased by 22%<sup>1</sup> compared with Manulife's NBV for the year ended December 31, 2015. This increase was driven by strong sales growth across our Asia businesses, reflecting both organic growth and the strong contribution from the bancassurance partnership with DBS. The total NBV margin increased from 23.5% in 2015 to 25.7% in 2016, largely driven by the scale benefits arising from strong sales growth in Other Asia. Variances by business are explained below.

The NBV margin increased in Japan in 2016 compared to 2015 primarily due to a more favourable business mix and management actions to improve product margins, partially offset by the unfavourable impact of interest rate movements. The NBV margin decreased in Hong Kong primarily due to a less favourable business mix and the unfavourable impact of interest rate movements. The NBV margin increased in Other Asia primarily due to scale benefits arising from strong sales growth. The NBV margin decreased in the U.S. primarily due to a less favourable business mix. The NBV margin increased in Canada primarily due to a more favourable business mix in Group Benefits (excluding Group Benefits the NBV margin for Canada decreased from 19.4% in 2015 to 17.0% in 2016 due to a less favourable business mix in other lines of business and the unfavourable impact of interest rate movements).

NBV in the first quarter of 2017 increased by 42%<sup>1</sup> compared to NBV in the first quarter of 2016. This increase was driven by strong sales growth across our Asia businesses and a more favourable business mix in Japan and Other Asia. The total NBV margin increased from 24.3% in the first quarter of 2016 to 26.9% in the first quarter of 2017. Variances by business are explained below.

<sup>1</sup> Growth in NBV is stated on a constant currency basis.

The NBV margin increased in Japan in the first quarter of 2017 compared to the first quarter of 2016, primarily due to a more favourable business mix. The NBV margin increased in Hong Kong primarily due to scale benefits arising from strong sales growth and the favourable impact of interest rate movements. The NBV margin increased in Other Asia primarily due to a more favourable business mix and scale benefits arising from strong sales growth. The NBV margin decreased in Canada primarily due to a less favourable business mix in Group Benefits (excluding Group Benefits the NBV margin for Canada increased from 22.5% in the first quarter of 2016 to 31.2% in the first quarter of 2017 primarily due to scale benefits from increased sales and the favourable impact of interest rate movements in Canadian retail insurance). The NBV margin decreased in the US primarily due to a less favourable business mix in our US Life insurance business.

### **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, 2016, and NBV for the year ended December 31, 2016 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<sup>(1),(2)</sup>

As at December 31, 2016

(C\$ millions)	Canada	U.S.	Asia	Corporate and Other	Total
<b>Embedded Value excluding holding company activities</b>	<b>\$ 16,363</b>	<b>\$ 26,930</b>	<b>\$ 17,578</b>	<b>\$ 2,056</b>	<b>\$ 62,927</b>
Carrying value of debt and preferred shares					(16,453)
<b>Total Embedded Value</b>					<b>46,474</b>
Potential impact on Embedded Value of changes in assumptions:					
100 bps increase in discount rate	\$ (1,217)	\$ (2,162)	\$ (969)	\$ 0	\$ (4,348)
100 bps decrease in discount rate	1,486	2,583	1,157	0	5,226
50 bps increase in fixed income market yields for all future years	391	727	330	(210)	1,238
50 bps decrease in fixed income market yields for all future years	(517)	(746)	(646)	234	(1,675)
100 bps increase in public equity and ALDA returns <sup>(3)</sup>	1,354	1,387	681	0	3,422
100 bps decrease in public equity and ALDA returns <sup>(3)</sup>	(1,349)	(1,605)	(660)	0	(3,614)
10% immediate increase in public equity and ALDA market values <sup>(3)</sup>	968	2,219	708	34	3,929
10% immediate decrease in public equity and ALDA market values <sup>(3)</sup>	(1,050)	(2,180)	(736)	(34)	(4,000)
Required surplus – relative 25% increase <sup>(4)</sup>	(1,075)	(2,690)	(470)	(0)	(4,235)

<sup>(1)</sup> 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.

<sup>(2)</sup> 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.

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

<sup>(4)</sup> This shows the impact of increasing required capital levels by a relative 25% above those shown in the assumptions table below. For example, the MCCR ratio for Canada would be 187.5% compared to a base of 150%.

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 divisions 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<sup>(1),(2)</sup>

(C\$ millions)	Canada	U.S.	Japan	Hong Kong	Other Asia	Total
<b>New Business Value for the period January 1 to December 31, 2016</b>	<b>\$ 169</b>	<b>\$ 59</b>	<b>\$ 345</b>	<b>\$ 368</b>	<b>\$ 285</b>	<b>\$ 1,226</b>
100 bps increase in discount rate	\$ (46)	\$ (17)	\$ (82)	\$ (41)	\$ (46)	\$ (232)
100 bps decrease in discount rate	48	21	101	48	55	273
50 bps increase in fixed income market yields for all future years	54	16	98	64	10	242
50 bps decrease in fixed income market yields for all future years	(56)	(16)	(105)	(88)	(13)	(278)
100 bps increase in public equity and ALDA return <sup>(3)</sup>	28	14	42	12	15	111
100 bps decrease in public equity and ALDA return <sup>(3)</sup>	(27)	(12)	(42)	(14)	(15)	(110)
10% immediate increase in public equity and ALDA market values <sup>(3)</sup>	10	6	-	3	15	34
10% immediate decrease in public equity and ALDA market values <sup>(3)</sup>	(10)	(6)	-	(3)	(15)	(34)
Required surplus – relative 25% increase <sup>(4)</sup>	(38)	(32)	(42)	(13)	(21)	(146)

<sup>(1)</sup> 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.

<sup>(2)</sup> 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 as a result of changes in product mix.

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

<sup>(4)</sup> This shows the impact of increasing required capital levels by a relative 25% above those shown in the assumptions table below. For example, the MCCR ratio for Canada would be 187.5% compared to a base of 150%.

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 September 30, 2016 projected to December 31, 2016, allowing for the actual change in key elements such as the market value of securities, the contribution of new business and policy experience. As such, management believes that the value is a fair representation of the Company’s EV as at December 31, 2016.

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 Minimum Continuing Capital and Surplus Requirements (“MCCR”) framework. The value of in-force business in Asia reflects local statutory earnings and capital requirements.

NBV is the change in EV as a result of 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 MCCR 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, 2016, and the NBV calculation for the year ended December 31, 2016 were:

### Principal Economic Assumptions as at December 31, 2016

Territory	Canada	U.S.	Japan	Hong Kong
Required capital	150% MCCSR	150% MCCSR	400% solvency margin	150% solvency margin
Discount rate	7.5%	8.25%	5.75%	10.0%
Public equity return	8.8%	9.8%	6.0%	11.0%
Jurisdictional income tax rate <sup>(1)</sup>	26.75%	35.0%	28.00%	16.5%
Reinvestment assumption for 10-year government bonds:				
Immediate	1.77%	2.44%	0.04%	1.86%
10 years in future	2.93%	3.16%	1.13%	2.03%
20 years in future	3.76%	3.95%	2.14%	2.92%
30 years in future	4.18%	4.29%	2.66%	3.25%

<sup>(1)</sup> 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
<b>Required Capital:</b>	The capital ratios in jurisdictions not included in the table above are as follows: Mainland China 100% of required minimum solvency margin 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 requirement minimum solvency margin
<b>Discount rate:</b>	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.
<b>Public equity returns:</b>	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 9.0% and 11.0%.
<b>Risk free interest rates:</b>	The risk free interest rates are based on forward interest rates implied by the equilibrium risk-free market curve at December 31, 2016. 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 and reflect the updates to economic reinvestment assumptions made as part of the 2016 review of actuarial methods and assumptions. These updates included a 10 basis point reduction to our ultimate-reinvestment-rate assumptions and a commensurate change in our calibration criteria for stochastic risk-free rates.
<b>Expenses:</b>	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. An allowance has been made for planned expense savings as a result of the Company's efficiency and effectiveness ("E&E") initiative. The present value of the future expense savings associated with the business covered in our EV disclosure contributed \$350 million to our EV. This includes the savings from our E&E program to be achieved in future years, and not allocated to future new business or businesses not covered in the EV. Unallocated Group office and Asia regional office expenses are charged to EV as incurred.

Assumption	Additional information
<b>Exchange rates:</b>	The foreign exchange rate used for the translation of EV results at December 31, 2015 and 2016 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.
<b>Other assumptions:</b>	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, 2016 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, 2015, and the NBV for the year ended December 31, 2015 were:

### Principal Economic Assumptions as at December 31, 2015

	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%	10.0%
Equity return	8.9%	9.8%	6.0%	11.5%
Income tax rate <sup>(1)</sup>	26.75%	35.0%	28.85%	16.5%
Reinvestment assumption for 10-year government bonds				
Immediate	1.45%	2.28%	0.27%	1.54%
10 years in future	2.82%	3.14%	1.80%	2.46%
20 years in future	3.71%	3.96%	2.49%	3.04%
30 years in future	4.19%	4.34%	2.93%	3.37%

<sup>(1)</sup> For Hong Kong, individual insurance products are taxed on a premium tax basis due to a Company election under Hong Kong tax regulations.

The principal economic assumptions used in the NBV calculation for the quarter ended March 31, 2017 were the same as at December 31, 2016 except as noted below:

### Principal Economic Assumptions for the quarter ended March 31, 2017

	Canada	U.S.	Japan	Hong Kong
Reinvestment assumption for 10-year government bonds				
Immediate	1.71%	2.40%	0.06%	1.58%
10 years in future	2.96%	3.13%	1.24%	2.02%
20 years in future	3.76%	3.93%	2.19%	2.87%
30 years in future	4.18%	4.28%	2.69%	3.23%

### 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. Such statements include, but are not limited to 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: 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.