

May 19, 2017

Mitsui Sumitomo Primary Life Insurance Company, Limited.

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**Disclosure of European Embedded Value as of March 31, 2017**


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Mitsui Sumitomo Primary Life Insurance Co., Ltd. (hereafter “MSI Primary Life” or “the Company”, President: Yasuhiro Nagai), a member of MS&AD Insurance Group Holdings, Inc. hereby discloses the European Embedded Value (“EEV”) as of March 31, 2017.

**Executive Summary:**

The Company’s EEV at March 31, 2017 was Yen 375.3 billion, an increase of Yen 41.4 billion from the EEV at March 31, 2016. The main reasons for the growth in value are the increasing value of fixed products due to interest rate movements, and the addition of value of new business.

(Yen billions)

		March 31, 2016	March 31, 2017	
				Increase (decrease)
EEV		333.8	375.3	41.4
	Value of net assets	245.5	252.9	7.3
	Value of in-force business	88.2	122.3	34.1
	Value of new business	33.7	19.1	(14.5)

**Attachments**

March 31, 2017 EEV

## **March 31, 2017 EEV**

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## **1. Overview**

### **1-1. Embedded Value**

Embedded value (“EV”) is calculated by adding the value of net assets at the valuation date to the discounted present value of future profits arising from the in-force business at the valuation date (“Value of In-Force”).

Business performance can be difficult to interpret using current statutory accounting which applies initial costs at the time of insurance contract sale, with profits emerging in later years. By considering the present value of future profits of in-force business, EV can be said to be a useful supplement to statutory accounting measures regarding business performance and company value.

### **1-2. EEV**

The EEV Principles and related guidance were published in May 2004 by the CFO Forum, an organization comprising the chief financial officers of Europe's leading life insurers, in order to improve consistency and transparency in EV reporting. In October 2005, further guidance on minimum required disclosures of sensitivities and other items was provided by the CFO Forum. In May 2016, an amended version of the EEV Principles was published by the CFO Forum which permits the use of projection methods and assumptions aligned with those applied for the European Solvency II regime, which came into effect in January 2016, and equivalent market consistent solvency regimes. EEV is EV calculated following the EEV Principles and related guidance, and the calculation of EEV has been adopted by a large number of life insurers in Europe and Japan.

### **1-3. The Company’s EEV**

The EEV disclosed herein covers only the business of the Company. As a result, the EEV disclosed herein is not the consolidated EEV of MS&AD Insurance Group, and does not cover the business of other life insurers, non-life insurers, or reinsurers within the Group

In the calculation of EEV, the Company has adopted a market-consistent approach – an approach which values cash flows from both assets and liabilities of a company consistently with comparable financial instruments traded in the market. A market-consistent approach is currently being adopted in Europe’s Solvency II and new regulations for adopting a similar approach for Japan life insurers are currently being considered. We have chosen a market consistent approach to reduce the subjectivity of the valuation of risk in EV, and also, through the adoption of the EEV Principles and associated guidance, to increase the transparency and comparability of the calculation of our results. Further, we consider that the use of a net worth based on market values makes the EV more useful as an indicator of business performance and company value.

We note that this EEV was not prepared on the basis of the European Insurance CFO Forum Market Consistent Embedded Value Principles ©<sup>1</sup>.

#### **1-4. Use of EV**

In calculating the EV of the Company, numerous assumptions are required concerning the future, which is inherently uncertain. As a result, future conditions may differ, perhaps significantly, from those assumed in the calculation of the embedded value. Further, the EV is not the only indicator of the value of a company, and investors may incorporate other information into their views on the value of a company which may differ significantly from the EV. Sufficient caution should be exercised when using the EV, with the aforementioned considerations kept in mind.

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## 2. EEV Calculation Results

### 2-1. The Company's EEV

The EEV of the Company at March 31, 2017 was Yen 375.3 billion, an increase of Yen 41.4 billion (+12.4%) from EEV at March 31, 2016. The overall value of net assets was Yen 252.9 billion, an increase of Yen 7.3 billion and the value of in-force business was Yen 122.3 billion, an increase of Yen 34.1 billion.

The increase of EEV was mainly due to increasing value of fixed products due to interest rates movements, and the addition of value of new business.

(Yen billions)

	March 31, 2016	March 31, 2017	
			Increase (decrease)
EEV	333.8	375.3	41.4
Value of net assets	245.5	252.9	7.3
Value of in-force business	88.2	122.3	34.1
Value of new business	33.7	19.1	(14.5)

### 2-2. Value of Net Assets

The value of net assets represents the market value of assets in excess of policyholder and other liabilities.

In other words, the value of net assets is calculated by adjusting the total net assets on the balance sheet for the retained earnings in quasi-equity liabilities, unrealized gains or losses in assets or liabilities not accounted for under the mark-to-market methodology and tax effect equivalents on the items above. The breakdown of the Company's value of net assets is as follows:

(Yen billions)

	March 31, 2016	March 31, 2017	Increase (decrease)
Value of net assets	245.5	252.9	7.3
Net assets (Note 1)	114.4	130.2	15.7
Contingency reserve (Note2)	43.3	48.8	5.4
Price fluctuation reserve	55.0	84.0	28.9
Unrealized gains/losses on securities	83.6	39.9	(43.6)
Other adjustment (Note3)	-	(2.3)	(2.3)
Tax effects on the above	(50.9)	(47.7)	3.2

(Note1): Excluding unrealized gains and losses on balance sheet.

(Note2): Excluding Contingency reserve III (“CR III”), which was reserved for minimum guarantee risk for variable products.

(Note3): An adjustment regarding unamortized ceding commission of the surplus relief reinsurance has been made for EEV calculation.

### 2-3. Value of In-force Business

The value of in-force business corresponds to the present value of future profits arising from business in-force at the valuation date. The breakdown by item is as follows:

(Yen billions)

	March 31, 2016	March 31, 2017	Increase (decrease)
Value of in-force business	88.2	122.3	34.1
Certainty equivalent present value of future profits	164.2	187.7	23.4
Time value of financial options and guarantees	(65.4)	(52.1)	13.3
Cost of holding required capital	(3.8)	(6.7)	(2.9)
Allowance for non-financial risks	(6.6)	(6.4)	0.2

- The certainty equivalent present value of future profits is the discounted present value of after-tax profits. The assumed investment return and discount rate are both calculated at the reference rate.
- The time value of financial options and guarantees is the value associated with the fluctuation of future cash flows, i.e. it is the value aside from the base value which is captured in the certainty equivalent present value of future profits.
- The cost of holding required capital arises from the taxation on investment returns on required capital assets and the related investment expenses incurred for the management of the assets.
- The allowance for non-financial risks covers costs not otherwise included in the certainty equivalent present value of future profits or the time value of financial options and guarantees, including operational risk and other risk.

## 2-4. Value of New Business

The value of new business is the value of new policies at the time of sale, acquired during the reporting period. Non-economic assumptions employed are the same as for the value of in-force business but point of sale economic assumptions have been used.

(Yen billions)

	March 31, 2016	March 31, 2017	Increase (decrease)
Value of new business	33.7	19.1	(14.5)
Certainty equivalent present value of future profits	60.6	25.2	(35.4)
Time value of financial options and guarantees	(23.5)	(2.4)	21.0
Cost of holding required capital	(1.6)	(1.8)	(0.2)
Allowance for non-financial risks	(1.7)	(1.7)	(0.0)

The new business margins are as follows:

(Yen billions)

	March 31, 2016	March 31, 2017	Increase (decrease)
Value of new business	33.7	19.1	(14.5)
Present value of future premium income	1299.4	1071.1	(228.3)
New business margin	2.6%	1.8%	(0.8%)

- The present value of future premium income is the future premium income discounted at the reference rate.
- The new business margin is the value of new business divided by the present value of future premium income.

### 3. Movement Analysis of EEV

(Yen billions)

	Value of net assets	Value of in-force	EEV
EEV at March 31, 2016	245.5	88.2	333.8
(1) Opening adjustments	(4.5)	0.0	(4.5)
EEV at March 31, 2016 after adjustment	241.0	88.2	329.3
(2) New business in reporting year	0.0	19.1	19.1
(3) Expected existing business contribution at the reference rate	(0.0)	1.3	1.3
(4) Expected existing business contribution above reference rate	0.3	3.3	3.7
(5) Transfers from value of in-force to value of net assets	6.6	(6.6)	0.0
Of which due to in-force at end of previous year	14.7	(14.7)	0.0
Of which due to new business	(8.0)	8.0	0.0
(6) Operating experience variances	(0.6)	0.9	0.2
(7) Changes in operating assumptions	0.0	0.1	0.1
(8) Economic variances and changes to economic assumptions	5.7	15.6	21.3
(9) Other operating movements	0.0	0.0	0.0
(10) Other non-operating movements	0.0	0.1	0.1
EEV at March 31, 2017	252.9	122.3	375.3

#### (1) Opening adjustments

This amount consists of shareholder dividends paid during the fiscal year ended March 31, 2017 and is deducted from the value of net assets.

#### (2) Value of new business

The value of new business represents the value of new policies at the time of sale, acquired during the reporting year. Non-economic assumptions employed are the same as for the value of in-force business but point of sale economic assumptions have been used.

As explained below, the value of new business includes the effects of the legislated changes in the timing of the increase in consumption tax rates.



(3) Expected existing business contribution at the reference rate

In the market consistent approach, future profits distributable to shareholders are discounted at the reference rate to produce the value of in-force business. The expected existing business contribution at the reference rate represents the unwinding of this discounting. This item includes the unwinding of the time value of options and guarantees, the cost of required capital, and the cost of non-financial risk.

(4) Expected existing business contribution above the reference rate

The market consistent approach assumes all future investment returns are equal to the reference rate, but due to the actual risk characteristics of the assets held, a return in excess of the reference rate is expected. This item represents the excess investment income expected over the reference rate. For the expected return used, please refer to section 6-1-3.

(5) Transfers from value of in-force to the value of net assets

A part of the value of in-force business as of the end of the previous year and a part of the value of new business during the reporting year (i.e. the profit associated with the current year) are transferred to the value of net assets. This item is the transferred value. The transfer does not increase or decrease the total EEV.

(6) Operating experience variances

This item is the result of differences between expected experience as at the end of the previous year, and realized experience.

(7) Changes to operating assumptions

This item represents the impact on future profits of changes in operating assumptions since the end of the previous year.

(8) Economic variances and changes to economic assumptions

This is the variance due to differences between economic assumptions (market interest rates, implied volatilities, and other assumptions) as at the end of the previous year, actually realized experience, and changes in economic assumptions. The increase in

EEV was mainly due to increased value of in-force of fixed products resulting from increased interest rates, improved investment performance on the assets held to support fixed products and increased value of variable products due to good performance in the equity market.

(9) Other operating movements

This item represents the impact on future profits of operational changes, excluding changes in operating assumptions.

(10) Other non-operating movements

This item represents the impact of reflecting the legislated changes in the timing of the increase in consumption tax rates.

## 4. Sensitivity Analysis

### 4-1. Sensitivity Analysis of EEV

The following table shows a sensitivity analysis of the EEV to changes in assumptions.

(Yen billions)		
Assumptions	EEV	Increase (decrease)
EEV at March 31, 2017	375.3	0.0
Sensitivity 1: 50bp upward parallel shift in reference yield curve	370.4	(4.9)
Sensitivity 2: 50bp downward parallel shift in reference yield curve	377.0	1.6
Sensitivity 3: 10% decline in equity and real estate values	369.7	(5.5)
Sensitivity 4: 10% decline in maintenance expenses	384.3	8.9
Sensitivity 5: 10% decline in surrender and lapse rate	374.5	(0.8)
Sensitivity 6: 5% decline in mortality and morbidity rates for life insurance products	375.9	0.6
Sensitivity 7: 5% decline in mortality and morbidity rates for annuity products	375.2	0.0
Sensitivity 8: Equity and property implied volatility increase of 25%	372.5	(2.7)
Sensitivity 9: Swaption implied volatility increase of 25%	371.3	(4.0)
Sensitivity 10: Required capital set at statutory minimum level	380.3	4.9
Sensitivity 11: Nil illiquidity premium	362.5	(12.7)

The following table shows the effect on the value of net assets of sensitivities 1 through 3 above. In sensitivities 4 through 11, only the value of in-force business is affected.

(Yen billions)	
	Increase (decrease)
Sensitivity 1: 50bp upward parallel shift in reference yield curve	(54.9)
Sensitivity 2: 50bp downward parallel shift in reference yield curve	51.7
Sensitivity 3: 10% decline in equity and real estate values	0.0

#### - Sensitivity 1

The item represents the effect on EEV of an upward parallel shift of 50bp in the yield curve of reference forward rates. Changes in the prices of bonds and loans change the value of net assets. Also, as future expected investment yields change, the value of in-force business changes.

- Sensitivity 2

The item represents the effect on EEV of a downward parallel shift of 50bp in the yield curve of reference forward rates. The lower limit reflected for the equivalent sensitivity in the previous report (assumed to be zero) is not applied. The risk-free forward rates are reduced by 50bp without the lower limitation of zero.

- Sensitivity 3

This item shows the effect on EEV of a decline of 10% in equity and real estate values.

- Sensitivity 4

The item represents the effect on EEV of a decrease of 10% in estimated maintenance expenses associated with maintaining in-force business.

- Sensitivity 5

The item represents the effect on EEV of a decrease of 10% in surrender and lapse rates.

- Sensitivity 6

The item represents the effect on EEV of a decrease of 5% in mortality and morbidity rates for life and medical insurance products.

- Sensitivity 7

The item represents the effect on EEV of a decrease of 5% in mortality rates for annuities.

- Sensitivity 8

The item represents the effect on EEV of an increase of 25% in the implied volatilities of equity and real estate values. This effect occurs because the value of in-force business changes as the time value of financial options and guarantees changes.

- Sensitivity 9

The item represents the effect on EEV of an increase of 25% in the implied volatilities of swaptions. This effect occurs because the value of in-force business changes as the time value of financial options and guarantees changes.

- Sensitivity 10

The item represents the effect on EEV in the event that required capital was changed to the statutory minimum level in Japan of a 200% solvency margin ratio.

- Sensitivity 11

The item represents the effect on EEV of eliminating the illiquidity premium from the economic assumption basis.

**4-2. Sensitivity Analysis of the Value of New Business**

(Yen billions)

Assumptions	Value of new business	Increase (decrease)
Value of new business issued in the fiscal year of 2016	19.1	0.0
Sensitivity 1: 50bp upward parallel shift in reference yield curve	21.5	2.4
Sensitivity 2: 50bp downward parallel shift in reference yield curve	16.5	(2.5)
Sensitivity 3: 10% decline in equity and real estate values	19.1	0.0
Sensitivity 4: 10% decline in maintenance expenses	21.1	2.0
Sensitivity 5: 10% decline in surrender and lapse rate	18.7	(0.3)
Sensitivity 6: 5% decline in mortality and morbidity rates for life insurance products	19.3	0.2
Sensitivity 7: 5% decline in mortality and morbidity rates for annuity products	19.0	0.0
Sensitivity 8: Equity and property implied volatility increase of 25%	19.2	0.0
Sensitivity 9: Swaption implied volatility increase of 25%	18.1	(1.0)
Sensitivity 10: Required capital set at statutory minimum level	20.4	1.3
Sensitivity 11: Nil illiquidity premium	15.4	(3.7)

The calculation approach is the same as for the sensitivities of the value of in-force business shown in Section 4-1.

## **5. EEV Methodology**

The methodology and assumptions adopted by the Company to calculate EEV are market-consistent and in accordance with the EEV Principles and related guidance issued by the CFO Forum.

### **5-1. Covered business**

The covered business represents all the life insurance business of the Company at the valuation date, and the Company has no subsidiaries. Any services provided by other companies in the MS&AD Insurance Group to the Company have been treated on an arms-length basis in these EEV results, as this EEV disclosure is from the Company's perspective and not MS&AD Group.

### **5-2. Value of net assets**

The value of net assets is calculated by adjusting the total net assets on the company's balance sheet for the following:

- In order to mark to market, differences in market value and book value of assets and liabilities other than insurance contract liabilities have been reflected
- Liabilities that are appropriate to be added to the value of net assets (the contingency reserve, excluding CR III, and reserve for price fluctuations) have been added on an after-tax basis.
- The value of net assets is shown after adjustment for the future costs of amortization of surplus relief reinsurance commission. The Company receives surplus relief reinsurance commission from the reinsurer to reduce the burden of initial costs at the time of new policy sale, and the commission is amortized over the contract period. For EEV purposes, we reclassify the future cost of amortization for surplus relief reinsurance commission from the value of in-force business to the value of net assets because we consider the reclassification more appropriately expresses the value of in-force business and the value of net assets.

The value of net assets consists of required capital and free surplus. Please refer to the amount respectively in "5-6. Cost of holding required capital".

### **5-3. Value of in-force business**

The value of in-force business is calculated as the certainty equivalent present value of projected after-tax profits deducting the time value of financial options and guarantees, the cost of holding required capital and allowance for non financial risks. The value of new business is calculated in the same way.

### **5-4. Certainty equivalent present value of future profits**

The certainty equivalent present value of future profits is the present value of after-tax profits based on the projected cash flows, calculated on a deterministic basis. All cash

flows are discounted at the reference rate, assuming the investment yield of all assets is equivalent to the reference rate. The intrinsic value of options and guarantees is included in this item. As described in “5-2. Value of net assets”, the certainty equivalent present value of future profits is shown after the adjustment regarding the surplus relief reinsurance.

#### **5-5. Time value of financial options and guarantees**

The time value of financial options and guarantees is calculated as the difference between the certainty equivalent present value of future profits and the average of the present value of future after-tax profits calculated by stochastic methods where economic assumptions are market consistent, as described in “6-1-2. Economic scenarios”.

The projected asset allocation is assumed to be the same as the asset allocation at the valuation date.

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The following options and guarantees are considered in calculating the time value of financial options and guarantees.

##### **- Minimum guarantees for variable products**

For variable products with minimum guarantees, the benefits of investment performance belong to policyholders if it is higher than minimum guarantee level, while the company must be responsible for costs to pay minimum guarantee benefits if the performance is unfavorable.

##### **- Automatic general account conversion at target**

Automatic general account conversion at target rider is available to the policyholders of both variable products and foreign currency denominated fixed products where the fund value is automatically converted to a secure general account dominated in Japanese Yen when the surrender value reaches a target value set by the policyholder.

##### **- Policyholder behavior**

Policyholders have the option to lapse at any time. We have considered the cost of dynamic lapse for variable products and fixed products.

## **5-6. Cost of holding required capital**

In order to secure financial solidity, life insurance companies are required to hold additional assets in excess of the statutory liability. The cost of holding required capital is the cost incurred through the payment of taxes on the investment income of the assets backing the required capital and the related investment expenses incurred for the management of the assets.

The Company defined required capital as the capital level required to maintain a target solvency margin ratio. The target solvency margin ratio was taken to be 600% on the solvency margin basis in Japan. The required capital on the respective bases was Yen 91.5 billion at March 31, 2016 and Yen 123.3 billion at March 31, 2017. (Free surplus was Yen 154.0 billion and Yen 129.6 billion, respectively.) The solvency margin basis permits the inclusion of the excess of reserves over cash surrender value up to a definite limit, and this inclusion was similarly reflected in this calculation.

## **5-7. Allowance for non-financial risks**

EEV Principles define the EV to be the present value of distributable profits attributable to shareholders arising from assets allocated to the covered business, calculated taking into account all the risks of the covered business.

Most of the uncertainty in future cash flow is captured in the certainty equivalent present value of future profits and the time value of options and guarantees. However, other risk factors should be considered, and we have included the cost of these risks in the EEV based on the results of simple models. The items are as follows.

### **- Reinsurance counterparty default risk**

The Company has transferred most of the minimum guarantee risks of the variable products and coinsured a portion of fixed products to reinsurance companies. These risks are therefore considered in terms of risk to the Company of reinsurance counterparty default.

### **- Operational risks**

### **- Non-recoverability of future tax losses**

In the future, if a loss arises, a tax loss is created, but may not be fully recoverable in subsequent years, in which case it cannot serve to reduce the tax burden of the company. This risk is not included in the certainty equivalent value of future profits or in the time value of options and guarantees, so we have considered it separately.



**5-8. Value of new business**

The value of new business is shown as the value of new policies at the time of sale, acquired during the reporting year. Non-economic assumptions employed are the same as for the value of in-force business but point of sale economic assumptions have been used. The value of new business is based on the definitions used for statutory reporting, and includes new premiums and additional premiums paid by existing policyholders, but does not include renewals of existing policies.

## 6. Principal EEV Assumptions

### 6-1. Economic assumptions

#### 6-1-1. Reference rates

In the certainty equivalent calculation, reference rates based on the swap rates as at the valuation date are used, taking into account assets in the company's portfolio and the liquidity of the market. We have taken the forward rate beyond for year's beyond which market rates are available to be the same as the forward rate for the last year for which market data is available (year 40). The table below shows, for selected terms, the Japanese Yen (JPY) swap rates (spot rates) which we have used.

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 10	Year 15
March 31, 2017	0.045%	0.053%	0.064%	0.083%	0.106%	0.267%	0.506%
March 31, 2016	(0.050%)	(0.114%)	(0.127%)	(0.107%)	(0.070%)	0.150%	0.357%
	Year 20	Year 25	Year 30	Year 35	Year 40	Year 45	Year 50
March 31, 2017	0.700%	0.807%	0.860%	0.901%	0.948%	0.989%	1.021%
March 31, 2016	0.510%	0.583%	0.615%	0.621%	0.618%	0.615%	0.613%

(Source: Bloomberg, shown above following extrapolation and interpolation)

The reference rates applied to single premium fixed annuities (SPFA) and single premium whole life (SPWL) business denominated in either Australian dollars (AUD) or U.S. dollars (USD) include allowance for an illiquidity premium. The majority of the SPFA and SPWL business is denominated in either AUD or USD, with minor exposures to other currencies. The SPFA and SPWL business is supported by portfolios which include AUD and USD corporate bonds. The inclusion of the illiquidity premium in the reference rates for these products is consistent with the company's internal risk management. The illiquidity premiums are calculated as 50% of the weighted spread of the relevant bond holdings of MSP (the assets backing the SPFA and SPWL liabilities) over swap rates, less 20 basis points – for each currency this is then subject to an overall minimum illiquidity premium of nil. The table below shows the illiquidity premium applied for SPFA and SPWL business.

	AUD	USD
March 31, 2017	0.150%	0.181%
March 31, 2016	0.180%	0.254%

This level of illiquidity premium is applied additively to the forward swap curve up to year 10. The illiquidity premium then reduces linearly from year 10 to nil in year 15. Nil illiquidity premium is applied to forward rates from year 15 onwards. This adjusted

forward curve is then reconstructed into a “swaps plus illiquidity premium” spot curve. The table below shows, for selected terms, the AUD and USD swap and “swap plus illiquidity premium” spot rates.

[AUD and USD swap plus illiquidity premium (spot rates)]

AUD	Year 1	Year 3	Year 5	Year 10	Year 15	Year 20	Year 30
March 31, 2017	2.181%	2.444%	2.705%	3.191%	3.434%	3.552%	3.591%
March 31, 2016	2.541%	2.454%	2.550%	2.859%	3.072%	3.199%	3.230%
USD	Year 1	Year 3	Year 5	Year 10	Year 15	Year 20	Year 30
March 31, 2017	1.571%	2.004%	2.265%	2.623%	2.772%	2.813%	2.798%
March 31, 2016	1.005%	1.231%	1.463%	1.952%	2.192%	2.283%	2.344%

[Reference: AUD and USD swap (spot rates)]

AUD	Year 1	Year 3	Year 5	Year 10	Year 15	Year 20	Year 30
March 31, 2017	2.028%	2.290%	2.552%	3.036%	3.306%	3.456%	3.526%
March 31, 2016	2.357%	2.270%	2.366%	2.675%	2.919%	3.083%	3.153%
USD	Year 1	Year 3	Year 5	Year 10	Year 15	Year 20	Year 30
March 31, 2017	1.388%	1.820%	2.080%	2.438%	2.618%	2.697%	2.721%
March 31, 2016	0.749%	0.974%	1.206%	1.694%	1.977%	2.122%	2.236%

(Source: Bloomberg, shown above following extrapolation and interpolation)

## 6-1-2. Economic scenarios

### 1. Interest rate model

We have adopted a single-factor Hull-White model, in which interest rates associated with JPY, AUD, USD, Euro (EUR) and New Zealand Dollar (NZD) are calculated. The model follows a risk-neutral approach in which JPY is set as a base currency, and correlations between the interest rates are taken into account. The interest rate model has been calibrated considering the market environment as of each reporting date, and the parameters used are estimated from the yield curve and implied volatilities of interest rate swaptions with various maturities. A set of 5,000 simulated economic scenarios are used in calculating time value of financial options and guarantees. These scenarios have been generated by Willis Towers Watson.

A selection of implied volatilities of interest rate swaptions used to calibrate the scenarios is as follows:

## Interest rate swaptions

Option Term (years)	Swap Term (years)	March 31, 2016					March 31, 2017				
		JPY	AUD	USD	EUR	NZD	JPY	AUD	USD	EUR	NZD
5	5	-	28.8%	42.4%	70.3%	12.0%	69.9%	21.1%	30.6%	53.1%	18.6%
5	7	107.4%	27.7%	40.4%	63.1%	11.6%	58.2%	20.3%	30.8%	47.9%	18.5%
5	10	79.4%	25.9%	38.4%	58.7%	11.1%	47.4%	19.4%	29.7%	44.3%	18.3%
7	5	95.6%	26.1%	38.4%	56.0%	-	53.0%	19.0%	28.3%	43.5%	-
7	7	76.6%	25.0%	37.0%	53.7%	-	44.1%	18.4%	28.2%	41.5%	-
7	10	65.2%	23.6%	34.7%	53.6%	-	38.7%	17.6%	27.9%	40.3%	-
10	5	-	23.5%	33.8%	50.5%	-	35.8%	17.1%	25.0%	38.5%	-
10	7	-	22.6%	32.7%	51.5%	-	33.1%	16.8%	25.0%	38.2%	-
10	10	55.0%	21.5%	32.1%	53.5%	-	33.2%	16.2%	25.2%	38.2%	-

(Source: Bloomberg, shown above following extrapolation and interpolation)

## 2. Implied volatilities of equities and exchange rates

Volatilities of traditional equity indices and exchange rates are calibrated based on the implied volatilities of relevant options traded in the market. Selected implied volatilities used to calibrate the economic scenarios are as follows:

### Equity Options

Currency	Underlying	Option Term	Implied Volatility	
			March 31, 2016	March 31, 2017
JPY	Nikkei225	3 Year	20.2%	19.4%
		4 Year	19.9%	19.4%
		5 Year	19.8%	19.4%
USD	S&P 500	3 Year	18.8%	17.1%
		4 Year	20.1%	18.4%
		5 Year	21.3%	19.7%
EUR	Euro Stoxx50	3 Year	20.1%	18.6%
		4 Year	20.1%	19.1%
		5 Year	20.2%	19.6%

(Source: Markit (interpolated/extrapolated))

### Foreign Exchange Options

Currency	Option Term	Implied Volatility	
		March 31, 2016	March 31, 2017
AUD	10 Year	18.2%	16.5%
USD	10 Year	12.4%	12.3%
EUR	10 Year	14.1%	12.5%
NZD	10 Year	18.0%	17.0%

(Source: Bloomberg)

### 3. Correlations

In addition to the use of the implied volatilities described above, we have calculated volatilities reflecting our asset portfolio composition and correlation factors among asset classes. The share of each asset in the portfolio is assumed to be unchanged over the projection period.

For correlation factors, we have not observed relevant market data from exotic options with sufficient liquidity. Therefore, we have estimated correlation factors based on the most recent 10 years of market data. The following table shows the correlation factors between the variables used. The following table shows the correlation factors between the variables used at March 31, 2017.

	JPY Short Rate	AUD Short Rate	USD Short Rate	EUR Short Rate	NZD Short Rate	JPY/AUD Exchange Rate	JPY/USD Exchange Rate	JPY/EUR Exchange Rate	JPY/NZD Exchange Rate	JPY Equity Index	USD Equity Index	EUR Equity Index
JPY Short Rate	100%	51%	57%	52%	44%	32%	48%	34%	33%	44%	25%	24%
AUD Short Rate	51%	100%	76%	69%	75%	54%	43%	51%	46%	46%	36%	35%
USD Short Rate	57%	76%	100%	78%	60%	31%	47%	34%	30%	40%	31%	30%
EUR Short Rate	52%	69%	78%	100%	53%	33%	28%	43%	30%	34%	33%	31%
NZD Short Rate	44%	75%	60%	53%	100%	37%	30%	34%	43%	31%	25%	20%
JPY/AUD Exchange Rate	32%	54%	31%	33%	37%	100%	55%	83%	89%	72%	66%	54%
JPY/USD Exchange Rate	48%	43%	47%	28%	30%	55%	100%	64%	54%	61%	24%	29%
JPY/EUR Exchange Rate	34%	51%	34%	43%	34%	83%	64%	100%	80%	66%	56%	47%
JPY/NZD Exchange Rate	33%	46%	30%	30%	43%	89%	54%	80%	100%	70%	65%	53%
JPY Equity Index	44%	46%	40%	34%	31%	72%	61%	66%	70%	100%	68%	68%
USD Equity Index	25%	36%	31%	33%	25%	66%	24%	56%	65%	68%	100%	83%
EUR Equity Index	24%	35%	30%	31%	20%	54%	29%	47%	53%	68%	83%	100%

(Source: Bloomberg)

### **6-1-3. Assumed investment yields on each asset class**

The assumed investment yields on each asset classes used in the calculation of the expected existing business contribution in excess of reference rate in the movement analysis are as follows:

Asset class	Assumed investment yield
Short term assets	0.00%
Domestic bonds	0.31%
Domestic equity	6.28%
Foreign bonds	1.23%
Foreign equity	5.07%

In the calculation of the expected existing business contribution in excess of reference rate, the portfolio investment yield is calculated by taking a weighted average of the assumed investment yield of each asset class above.

### **6-2. Non-economic assumptions**

All cash flows (including premiums, operating expenses, benefits and claims, payments of cash surrender value, taxes, and others) are projected applying best estimate assumptions up to the termination of the policies, with the assumptions set by product with consideration to past, current and expected future experience.

#### **6-2-1. Expenses**

Expense assumptions were set based on the actual experience in the latest year.

The current consumption tax rate has been set at 8% and at 10% from October 1, 2019 onward in calculation of the EEV.

The future inflation rate was set to zero.

#### **6-2-2. Corporate tax rates**

Corporate tax rates were set based on recent tax practice. In the EEV the corporate tax rates (including local tax) used for fiscal years 2016 and 2017 is 28.24% and from fiscal year 2018 is 28.00%.

## 7. Actuarial Opinion

The Company requested Willis Towers Watson, an independent actuarial firm, to review the calculation of the Company's EEV results and obtained the following opinion.

Willis Towers Watson has reviewed the methodology and assumptions used to determine the embedded value results as at March 31, 2017 for MSI Primary Life. The review covered the embedded values as at March 31, 2017, the value of new business issued in fiscal year 2016, the analysis of movement in the embedded value during fiscal year 2016 and the sensitivities of the embedded value and new business value to changes in assumptions.

Willis Towers Watson has concluded that the methodology and assumptions used, together with the disclosure provided in this document, comply with the EEV Principles. In particular:

- The methodology makes allowance for the aggregate risks in the covered business through the Company's market-consistent methodology as described in this document, which includes a stochastic allowance for financial options and guarantees, and deductions to allow for the frictional cost of required capital and the impact of non-financial risks;
- The operating assumptions have been set with appropriate regard to past, current and expected future experience; and
- The economic assumptions used are internally consistent and consistent with observable market data.

Willis Towers Watson has also reviewed the results of the calculations, without however undertaking detailed checks of all the models, processes and calculations involved. On the basis of this review, Willis Towers Watson is satisfied that the disclosed results have been prepared, in all material respects, in accordance with the methodology and assumptions set out in this disclosure document.

In arriving at these conclusions, Willis Towers Watson has relied on data and information provided by the Company, including estimates for the market value of assets for which no market prices exist. This opinion is made solely to the Company in accordance with the terms of Willis Towers Watson's engagement letter. To the fullest extent permitted by applicable law, Willis Towers Watson does not accept or assume any responsibility, duty of care or liability to anyone other than the Company for or in connection with its review work, the opinions it has formed, or for any statement set forth in this opinion.