

May 22, 2017  
Sony Life Insurance Co., Ltd.

## Disclosure of Market Consistent Embedded Value as of March 31, 2017

Tokyo, May 22, 2017 – Sony Life Insurance Co., Ltd. (“Sony Life”), a wholly owned subsidiary of Sony Financial Holdings Inc., today disclosed its Market Consistent Embedded Value (“MCEV”) as of March 31, 2017, compliant with the European Insurance CFO Forum Market Consistent Embedded Value Principles<sup>1</sup> (“MCEV Principles”). MCEV is an indicator used to support an analysis of the value of a life insurance operation.

Sony Life maintains its accounting records and prepares its financial statements in Japanese yen in accordance with the Company Law of Japan and the Insurance Business Law of Japan and in conformity with generally accepted accounting principles and practices in Japan (“Japanese GAAP”). Sony Financial Holdings Inc.’s parent company, Sony Corporation, reports its financial statements in accordance with generally accepted accounting principles and practices in the United States. The figures shown below with respect to Sony Life’s financial statements are based on Japanese GAAP.

### Summary

Sony Life’s MCEV as of March 31, 2017 was as follows. New business value indicates the value of new business acquired during the fiscal year ended March 31, 2017.

(Billions of yen)

	As of March 31, 2017	As of March 31, 2016 (Restated)	Change
MCEV	1,441.1	1,330.1	111.0
Adjusted net worth	1,657.7	2,074.4	(416.7)
Value of existing business	(216.7)	(744.4)	527.7

	FY2016	FY2015 (Restated)	Change
New business value <sup>2</sup>	29.1	50.4	(21.3)

Beginning with the disclosure as of March 31, 2017, the extrapolation methodology for ultra-long term risk-free rates was changed from assuming a flat forward rate after the last market data to applying an ultimate forward rate. Due to this change, Sony Life restated its MCEV as of March 31, 2016 and new business value during the fiscal year ended March 31, 2016 by applying the same methodology. Please refer to Section 2.1 for the impact of the restatement and Section 3.1 (1) for the risk-free rates used for restatement.

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<sup>2</sup> For FY2016, the methodology used to calculate new business value has been revised in addition to the above change in the extrapolation methodology for ultra-long term risk-free rates. Please refer to Sections 2.4 and 4.10 for details.

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## **1. Introduction**

### **1.1 About MCEV**

The primary purpose of this press release is to provide information regarding the economic value of our life insurance business and movement analysis of its value.

Many companies—primarily leading life insurance firms in Europe—have disclosed European Embedded Value (“EEV”) following the publication of EEV Principles by the CFO Forum in May 2004. The CFO Forum, formed by the Chief Financial Officers (CFOs) of major European insurance companies, published the EEV Principles in order to address criticisms of Traditional Embedded Value (TEV) and to facilitate the implementation of market consistent valuation methods. (Criticisms of TEV included concern over the valuation of the cost of options and guarantees and concerns about the comparability of results among firms.) This led to the disclosure by many leading European insurers of EEV using a market-consistent approach.

The EEV Principles allow various calculation methodologies, including MCEV. Recognizing that many insurance companies in Europe had begun to disclose MCEV as part of their financial reports and to use MCEV as an internal management tool, the CFO Forum published the MCEV Principles in June 2008. The MCEV Principles aim to improve the effectiveness of EV information for investors by streamlining MCEV disclosure standards for international use. The CFO Forum revised the MCEV Principles in May 2016 and added guidance that allows EU Solvency II methodologies with conditions.

Sony Life has disclosed MCEV in compliance with the MCEV Principles from March 31, 2008.

### **1.2 Covered business**

Our calculations include the business operated by Sony Life and its subsidiaries and affiliated companies. It should be noted, however, that we have calculated the value of the subsidiaries and affiliated companies by adding the following values to the calculation of adjusted net worth:

- AEGON Sony Life Insurance Co., Ltd. is valued at net asset value plus reserve for price fluctuations and contingency reserve, minus intangible fixed assets, reinsurance credits on modified coinsurance (to be amortized in the future) and Insurance Business Law Article 113 deferred assets, plus the tax effect equivalent on Insurance Business Law Article 113 deferred assets, multiplied by the participation rate.
- Other companies are valued at book value under Japanese GAAP.

### **1.3 Statement of directors**

The Board of Directors of Sony Life confirms that the EV presented here has been produced following the methodology set out in the MCEV Principles. Areas of material noncompliance are stated in Section 1.5

## 1.4 Opinion of outside specialist

Sony Life requested Milliman, Inc., an external actuarial consulting firm with expert knowledge in the area of MCEV valuations, to review the methodology, assumptions and calculations and obtained an opinion from this firm. Please refer to Section 5 (“Opinion of Outside Specialist”) for details.

## 1.5 Compliance with MCEV Principles

We have calculated our MCEV in accordance with the calculation methodologies and assumptions in the MCEV Principles. Notable points regarding compliance with the MCEV Principles are as follows:

- The reference rate used in the calculations has been defined as the government bond nominal spot rate curve rather than the swap rate curve as stipulated in the MCEV Principles.
- The calculated value of MCEV is the value for Sony Life only, and not the consolidated value of our parent company, Sony Financial Holdings Inc.
- Group MCEV, as prescribed in the MCEV Principles, is not considered in this report, as the report is for Sony Life on a stand-alone basis.
- With respect to Sony Life’s subsidiary and its equity-method affiliates, we have not evaluated their life insurance business but reflected the following values in the calculation of adjusted net worth:
  - AEGON Sony Life Insurance Co., Ltd. is valued at net asset value plus reserve for price fluctuations and contingency reserve, minus intangible fixed assets, reinsurance credits on modified coinsurance (to be amortized in the future) and Insurance Business Law Article 113 deferred assets, plus the tax effect equivalent on Insurance Business Law Article 113 deferred assets, multiplied by the participation rate
  - Other companies are valued at book value under Japanese GAAP

## 1.6 Definition of MCEV

The MCEV Principles define MCEV as follows:

MCEV represents the present value of the current and future distributable earnings to shareholders generated from assets allocated to the covered business after sufficient allowance for the aggregate risks in the covered business. MCEV can be expressed as the EV evaluated by a method consistent with the calculation of prices of financial products traded in the financial markets.

MCEV consists of adjusted net worth and the value of existing business.

Adjusted net worth is the amount of assets allocated for the covered business as of the valuation date and is calculated as the amount of its market value in excess of statutory policy reserves and other liabilities. Adjusted net worth can be split into required capital and free surplus.

The value of existing business consists of the present value of certainty-equivalent profit, time value of options and guarantees, frictional costs, and the cost of non-hedgeable risks.

- The present value of certainty-equivalent profit is the present value of profit based on future cash flows

generated from the covered business.

- Time value of options and guarantees is the stochastic valuation of the time value of options and guarantees inherent in insurance contracts based on risk-neutral scenarios.
- Frictional costs are the present value of investment costs and taxes on assets backing the required capital at each point of time in the future.
- Cost of non-hedgeable risks means the present value of costs necessary to maintain capital related to non-hedgeable risks in the future.

These four items are all evaluated on an after-tax basis.

Please refer to Section 4 for more detailed definitions of terms.

### **1.7 Use of government bond yields as risk-free rates**

EU Solvency II suggests the criteria the relevant risk-free rates should meet. Considering some of the criteria, as described below, we use government bond yields instead of swap rates as a proxy for risk-free rates.

- No credit risk

The Japanese yen is the currency whose purchasing power is regulated by the Japanese government under a floating exchange rate system, and Japanese government bonds denominated in Japanese yen can be considered to be financial assets with the lowest credit risk. On the other hand, swap rates are reflected by credit risk with regard to LIBOR.

- Realism

Realism refers to whether it should be possible to earn the rates in practice without credit risk. We have been conducting risk management based on economic values. For the purpose of interest rate risk management (ALM), given the difficulties in utilizing swap rate transactions due to limitations under the current accounting framework and solvency regulations as well as the credit risk issue mentioned above, we are primarily utilizing Japanese government bonds in practice.

- High liquidity

Japanese government bonds have high liquidity even for long maturities such as 30 or 40 years.

We also use U.S. Treasury yields for risk-free rates in U.S. dollars that were applied to U.S. dollar-denominated products.

Please refer to Section 2.7 for the impact of the change in risk-free rates from government bond yields to swap rates on MCEV as of March 31, 2017.

## 2. MCEV Results for Sony Life

### 2.1 MCEV results

Beginning with the disclosure as of March 31, 2017, the extrapolation methodology for ultra-long term risk-free rates was changed from assuming a flat forward rate after the last market data to applying an ultimate forward rate. Due to this change, Sony Life restated its MCEV as of March 31, 2016 and new business value during the fiscal year ended March 31, 2016 by applying the same methodology. The impact of the restatement is shown below. Please refer to Section 3.1 (1) for the risk-free rates used for restatement.

(Billions of yen)

	As of March 31, 2016 (Restated)	As of March 31, 2016	Change
MCEV	1,330.1	1,063.7	266.4
Adjusted net worth	2,074.4	2,074.4	—
Value of existing business	(744.4)	(1,010.7)	266.4

	FY2015 (Restated)	FY2015	Change
New business value	50.4	35.2	15.1

Sony Life's MCEV as of March 31, 2017 increased ¥111.0 billion, due to an increase in interest rates and other factors. Please note that the significant changes in adjusted net worth and value of existing business offset each other with the effect of ALM.

(Billions of yen)

	As of March 31, 2017	As of March 31, 2016 (Restated)	Change
MCEV	1,441.1	1,330.1	111.0
Adjusted net worth	1,657.7	2,074.4	(416.7)
Value of existing business	(216.7)	(744.4)	527.7

### 2.2 Adjusted net worth

Adjusted net worth is calculated as the market value of assets allocated for the covered business in excess of statutory policy reserves and other liabilities as of the valuation date. Based on Japanese GAAP, it is calculated as the total amount of the net assets section on the balance sheets, adding reserve for price fluctuations, contingency reserve, reserve for possible loan losses, reinsurance debit for coinsurance-type reinsurance (future profits to be recognized), unrealized gains or losses on held-to-maturity securities, unrealized gains or losses on policy reserve matching bonds and unrealized gains or losses on land and buildings, less unfunded pension liabilities and intangible fixed assets, and adjusting for the amount of tax effect equivalent to these nine items, on which valuation gains or losses on subsidiaries and affiliated companies are added. The adjusted net worth at the end of the current fiscal year decreased ¥416.7 billion, primarily because of the decrease in unrealized gain on held-to-maturity securities caused by an increase in interest rates. The breakdown is shown in the table below. Please note that the

restatement as of March 31, 2016 had no impact on the adjusted net worth as of March 31, 2016.

(Billions of yen)

	As of March 31, 2017	As of March 31, 2016	Change
Adjusted net worth	1,657.7	2,074.4	(416.7)
Total net assets	473.6	482.2	(8.6)
Reserve for price fluctuations	46.0	44.3	1.7
Contingency reserve	82.5	75.2	7.3
Reserve for possible loan losses	0.0	0.0	0.0
Reinsurance debit for coinsurance-type reinsurance	1.2	—	1.2
Unrealized gains or losses on held-to-maturity securities	1,445.6	2,026.2	(580.6)
Unrealized gains or losses on policy reserve matching bonds	26.0	41.3	(15.3)
Unrealized gains or losses on land and buildings	71.0	56.5	14.5
Unfunded pension liabilities	(3.6)	(4.8)	1.3
Intangible fixed assets	(19.4)	(19.2)	(0.2)
Tax effect equivalent of above nine items	(461.8)	(621.4)	159.6
Valuation gain or loss on subsidiaries and affiliated companies	(3.4)	(5.8)	2.5

We set our required capital as the larger of the amount of Japanese regulatory minimum capital requirement at the solvency margin ratio of 200% or the amount of capital to cover risks based on an internal model based on economic value. The required capital at the end of the current fiscal year decreased due to a decrease in the economic value of technical provisions that mainly resulted from an increase in interest rates. Please refer to Section 4.7 for the method used to calculate required capital.

(Billions of yen)

	As of March 31, 2017	As of March 31, 2016 (Restated)	Change
Adjusted net worth	1,657.7	2,074.4	(416.7)
Free surplus	496.1	394.0	102.0
Required capital	1,161.7	1,680.4	(518.7)



## 2.3 Value of existing business

The value of existing business is the present value of certainty-equivalent profit less the time value of options and guarantees, and frictional costs and the cost of non-hedgeable risks. The value of existing business as of March 31, 2017 increased ¥527.7 billion, primarily because of an increase in interest rates. The breakdown of the value of existing business is shown in the table below.

(Billions of yen)

	As of March 31, 2017	As of March 31, 2016 (Restated)	Change
Value of existing business	(216.7)	(744.4)	527.7
Present value of certainty-equivalent profit	350.0	(169.9)	519.9
Time value of options and guarantees	(145.2)	(137.3)	(7.8)
Frictional costs	(35.6)	(36.4)	0.8
Cost of non-hedgeable risks	(385.9)	(400.7)	14.8

## 2.4 New business value

New business value represents the value at point of sale of new business acquired during the fiscal year ended March 31, 2017, and does not include the value of new business expected to be acquired in the future. In the previous year-end disclosure, new business value was calculated quarterly using the assumptions as of the end of each quarter. From this year-end disclosure, economic assumptions as of the end of each month are applied. Please refer to Section 4.10 for details. The new business value in this fiscal year decreased ¥21.3 billion, primarily because the overall level of interest rates throughout the year decreased compared with the previous fiscal year. The breakdown of new business value is as follows:

(Billions of yen)

	As of March 31, 2017	As of March 31, 2016 (Restated <sup>3</sup> )	Change
Value of new business	29.1	50.4	(21.3)
Present value of certainty-equivalent profit	68.3	114.2	(45.8)
Time value of options and guarantees	(9.1)	(29.6)	20.5
Frictional costs	(0.1)	(0.4)	0.3
Cost of non-hedgeable risks	(29.8)	(35.0)	5.2
Other profits or losses	(0.2)	1.3	(1.5)

<sup>3</sup> The new business value as of March 31, 2016 was restated for the change in extrapolation methodology for ultra-long term risk-free rates and calculated quarterly using the assumptions as of the end of each quarter.

## 2.5 New business margin

The new business margin described below is the ratio of the value of new business to the present value of premium income. The present value of premium income is calculated applying the same assumptions as those for the calculation of new business value, and is based on premiums before the deduction of reinsurance premiums.

(Billions of yen)

	As of March 31, 2017	As of March 31, 2016 (Restated)	Change
Value of new business	29.1	50.4	( 21.3)
Present value of premium income	1,297.4	1,475.9	(178.5)
Value of new business / Present value of premium income	2.2%	3.4%	(1.2)points

Relationships between annualized premiums from new policies and the present value of premium income from new business were as follows:

(Billions of yen)

	As of March 31, 2017	As of March 31, 2016 (Restated)	Change
New business single premium	22.6	125.2	(102.6)
Annualized premiums from level premium new business <sup>4</sup>	104.7	111.0	(6.2)
Average annualization multiplier <sup>5</sup>	12.17	12.17	(0.00)

<sup>4</sup> Annualized premiums from level premium new business is calculated by multiplying the number of payments in a year by the amount of premiums received at a time. It should be noted that the definition of annualized premiums here is different from that used in disclosures such as financial results and annual reports.

<sup>5</sup> The average annualization multiplier is calculated as (Present value of premium income – New business single premium) / Annualized premiums from level premium new business.

## 2.6 Reconciliation analysis from MCEV at the end of the prior year

The table below shows the reconciliation analysis of MCEV as of March 31, 2017, from MCEV as of March 31, 2016.

(Billions of yen)

	Free surplus	Required capital	Value of existing business	MCEV
Opening MCEV (MCEV as of March 31, 2016)	100.1	1,974.3	(1,010.7)	1,063.7
Change in extrapolation methodology for risk-free rates	293.9	(293.9)	266.4	266.4
Opening MCEV (MCEV as of March 31, 2016) (restated)	394.0	1,680.4	(744.4)	1,330.1

(Billions of yen)

	Free surplus	Required capital	Value of existing business	MCEV
Opening MCEV (MCEV as of March 31, 2016) (restated)	394.0	1,680.4	(744.4)	1,330.1
Opening adjustments	(21.0)	—	—	(21.0)
Adjusted opening MCEV	373.0	1,680.4	(744.4)	1,309.1
New business value	(1.3)	1.1	29.3	29.1
Expected existing business contribution (risk-free rate)	(0.5)	(2.6)	23.6	20.4
Expected existing business contribution (in excess of risk-free rate)	0.9	4.2	10.5	15.6
Transfers from value of existing business and required capital to free surplus	18.2	(69.7)	51.5	—
<i>Of which, on new business</i>	(56.5)	—	56.5	—
Experience variances	47.0	(39.9)	3.3	10.4
Assumption changes	(61.9)	61.9	(45.0)	(45.0)
Other operating variance	0.0	(0.0)	0.0	0.0
Operating MCEV earnings	2.3	(44.9)	73.1	30.5
Economic variances	119.1	(472.2)	453.2	100.0
Other non-operating variance	1.6	(1.6)	1.4	1.4
Total MCEV earnings	123.0	(518.7)	527.7	132.0
Closing adjustments	—	—	—	—
Closing MCEV (MCEV as of March 31, 2017)	496.1	1,161.7	(216.7)	1,441.1

### (1) Change in extrapolation methodology for risk-free rates

This figure reflects the impact of the change in the extrapolation methodology for ultra-long term risk-free rates from assuming a flat forward rate after the last market data to applying an ultimate forward rate. It also includes the impact of the change in inflation rates for the 41st year and later to assure consistency with the extrapolation methodology for ultra-long term risk-free rates. For details of the inflation rates, please refer to Section 3.3 (8).

(2) Opening adjustments

These adjustments reflect changes in dividends paid to shareholders.

(3) New business value

This figure reflects increases resulting from the acquisition of new business during the fiscal year ended March 31, 2017. Please refer to Section 4.10 for information concerning the calculation method.

(4) Expected existing business contribution (risk-free rate)

This figure includes the release of the portion for the fiscal year ended March 31, 2017 of the time value of options and guarantees and the cost of non-hedgeable risks, in addition to the unwinding of the opening MCEV at a risk-free rate.

(5) Expected existing business contribution (in excess of risk-free rate)

This figure reflects the profit expected in excess of the risk-free rate generated by holding assets such as ordinary corporate bonds, loans, stocks and real estate. The expected yield used for the fiscal year ended March 31, 2017 was 0.095%, which was developed by reflecting our view of the market environment and annual investment plans for the year against the asset balance at the end of the previous fiscal year.

(6) Transfer from value of existing business and required capital to free surplus

This figure tracks changes in free surplus that emerge over the course of a fiscal year due to transferring profit earned during the fiscal year from existing business value to free surplus and to changes in required capital. The transfer of profit includes both the transfer of profit that was anticipated during the current fiscal year under the MCEV calculation performed at the prior year-end and the transfer of profit that was calculated as a component of new business value for the current fiscal year.

The value of MCEV itself does not change as a result of this transfer as the transfer merely constitutes an internal shift among MCEV components.

(7) Experience variances

These variances show the impact on MCEV of the actual versus assumed differences in non-economic expected profit for the fiscal year ended March 31, 2017 under the MCEV calculation as of March 31, 2016, and of the differences between actual policies in force as of March 31, 2017, and those that were projected to be in force on March 31, 2016 using persistency assumptions.

(8) Assumption changes

This figure primarily indicates the impact of changes in assumptions based on experience data in mortality and morbidity rates, lapse and surrender rates, and operating expense rates. While mortality and morbidity rates are declining, the value of existing business fell primarily because of a decrease in assumed lapse and surrender rates this fiscal year. The primary cause for this is higher persistency on those blocks of business for which risk-free rates are below the interest rates underlying statutory reserve in the low interest rates environment in Japan.

(9) Other operating variance

This represents the impact of improvements and corrections of the model used in calculating MCEV.

(10) Operating MCEV earnings

This figure shows the aggregate amount of items (3) through (9).

(11) Economic variances

These variances show the impact of actual to assumed differences in economic assumptions, such as market interest rates and implied volatilities that were reflected in the market environment when calculating MCEV as of March 31, 2016 (for new business values, as of the date when they were calculated) on future values, and the impact of the actual to assumed difference in expected investment income that was assumed to be realized during the year ended March 31, 2017 under MCEV as of March 31, 2016.

The major reasons for the increase in the value of existing business include an update of economic scenarios due to changes in the market environment such as an increase in interest rates, an increase in stock prices and changes in implied volatilities, accounting for an increase in the present value of certainty-equivalent profit of ¥416.2 billion, a decrease in the time value of options and guarantees of ¥14.6 billion, a decrease in frictional costs of ¥4.6 billion and a decrease in the cost of non-hedgeable risks of ¥35.4 billion. Another factor is an increase in expenses tied to the rise in inflation rates, accounting for a decrease in the value of existing business of ¥17.6 billion. The major reason for the decline in the adjusted net worth was the decrease in prices of government bonds caused by an increase in interest rates. The required capital fell primarily because the amount of liabilities and risks on an economic basis decreased due to an increase in interest rates, causing declines in frictional costs and the cost of non-hedgeable risks.

Please note that the significant changes in adjusted net worth and value of existing business offset each other with the effect of ALM. The total amount of changes in MCEV are disaggregated into an increase of ¥117.6 billion as a result of changes in the market environment such as the increase in interest rates, and a decrease of ¥17.6 billion as a result of the increase in inflation rates.

(12) Other non-operating variance

This figure includes the impact of the change in timing of the consumption tax increase. Please refer to Section 3.3 (7) for details.

(13) Closing adjustments

No items were included in closing adjustments.

## 2.7 Sensitivity analysis

The impact of changing the underlying assumptions on MCEV and new business value is as follows:

Sensitivities of MCEV

(Billions of yen)

Assumption	Change in assumption	MCEV	Change in amount	Rate of change
Base	No change	1,441.1	—	—
Interest rates	50bp decrease	1,309.6	(131.4)	(9%)
	50bp increase	1,492.3	51.2	4%
	Swap rates	1,404.4	(36.7)	(3%)
Stock / Real estate market value	10% decrease	1,418.6	(22.5)	(2%)
Stock / Real estate implied volatility	25% increase	1,413.1	(27.9)	(2%)
Interest swaption implied volatility	25% increase	1,420.2	(20.9)	(1%)
Maintenance expenses	10% decrease	1,464.7	23.7	2%
Lapse and surrender rates	x 0.9	1,427.6	(13.5)	(1%)
Mortality rates	Death protection products x 0.95	1,503.7	62.6	4%
	Third-sector and annuity products x 0.95	1,429.5	(11.5)	(1%)
Morbidity rates	x 0.95	1,504.1	63.0	4%
Required capital	Regulatory minimum	1,472.7	31.6	2%
Foreign exchange rates	10% appreciation of JPY	1,432.6	(8.5)	(1%)

The breakdown of the changes in MCEV into the adjusted net worth and the value of existing business are shown in the table below. Of items not specified in this table, only the value of existing business has been changed while adjusted net worth remains the same.

(Billions of yen)

Assumption	Change in assumption	MCEV	Adjusted net worth	Value of existing business
Interest rates	50bp decrease	(131.4)	695.0	(826.4)
	50bp increase	51.2	(664.4)	715.6
Stock / Real estate market value	10% decrease	(22.5)	(10.9)	(11.6)
Foreign exchange rates	10% appreciation of JPY	(8.5)	3.6	(12.1)

## Sensitivity of new business value

(Billions of yen)

Assumption	Change in assumption	New business value	Change in amount	Rate of change
Base	No change	29.1	—	—
Interest rates	50bp decrease	0.7	(28.4)	(98%)
	50bp increase	51.7	22.7	78%
	Swap rates	17.7	(11.4)	(39%)
Stock / Real estate market value	10% decrease	29.0	(0.0)	(0%)
Stock / Real estate implied volatility	25% increase	28.4	(0.7)	(2%)
Interest swaption implied volatility	25% increase	27.5	(1.6)	(6%)
Maintenance expenses	10% decrease	30.7	1.6	6%
Lapse and surrender rates	x 0.9	36.2	7.1	24%
Mortality rates	Death protection products x 0.95	34.1	5.0	17%
	Third sector and annuity products x 0.95	28.7	(0.4)	(1%)
Morbidity rates	x 0.95	31.1	2.0	7%
Required capital	Regulatory minimum	29.1	0.0	0%
Foreign exchange rates	10% appreciation of JPY	27.5	(1.5)	(5%)

## (1) Interest rates

This sensitivity represents the impact of an immediate parallel shift of the Japanese and foreign government bond yield curves as of the end of March 2017, and the impact if swap rates were used instead of government bond yields. In each parallel shift sensitivity, adjusted net worth changes as the market value of bonds and other assets change; this is not applicable to the case where swap rates are used. In each of the interest rate sensitivities, the value of existing business changes as interest rates, the discount rate, yields of new bonds to be purchased in the future as existing bonds mature, and the investment returns on stocks and other assets change.

Please note that, due to the bonds held for ALM purposes, the adjusted net worth moves in a direction to offset a change in the value of existing business.

The sensitivities are calculated for a 50bp increase and decrease rather than a 100bp increase and decrease as illustrated in the MCEV Principles, considering the level of interest rates in Japan. Here, the sensitivity scenarios were made so that the parameters related to interest rate volatility were equal to those derived for the base case. Only the parameters related to the interest rate term structure were altered when scenarios were developed using the interest rate model. The ultra-long term risk-free rates were extrapolated without changing the ultimate forward rate. The floor for downward changes in interest rates was set at 0%.

The sensitivities of new business value reflect the changes in unrealized gains or losses of pre-hedge assets included in new business value. Please refer to Section 4.10 for details on pre-hedge.

## (2) Stock and real estate market value

This sensitivity represents the impact of an immediate drop in market value of stock and real estate as of the end of March 2017. Adjusted net worth is directly affected by the change in market value of stock and real estate. The value of existing business would also be affected by the change in the value of assets.

(3) Implied volatility of stock and real estate

This sensitivity represents the impact of an increase in the implied volatilities of stock used in calculating the time value of options and guarantees. The value of existing business changes because changes in stock implied volatilities change the time value of options and guarantees.

(4) Interest swaption implied volatility

This sensitivity represents the impact of a change in the implied volatility of interest swaption used in calculating the time value of options and guarantees. The value of existing business would change as the time value of options and guarantees change.

Please note that the definition of implied volatility was changed as of this fiscal year-end. Please refer to Section 3.1 (2) for details.

(5) Maintenance expenses

This sensitivity represents the impact of a decrease in maintenance expenses. It should be noted that maintenance expenses do not include sales commissions from the in-force policies payable to Sony Life's Lifepanner sales employees and other sales force in future periods.

(6) Lapse and surrender rates

This sensitivity represents the impact of a decrease in lapse and surrender rates.

(7) Mortality rates

This sensitivity represents the impact of a decrease in mortality rates. We have shown the impact on "death protection products" and the impact on "third-sector insurance and annuity products" separately, as they would have different impacts. In the segment of "third-sector insurance and annuity products", we include base policies and riders of which the principal benefits are accidental death, disability, cancer, medical and nursing care benefits, and individual annuities. No management actions were reflected.

(8) Morbidity rates

This sensitivity represents the impact of a decrease in the morbidity rates of sickness and others in third-sector products.

(9) Required capital

This sensitivity represents the impact in the event that required capital is changed to the regulatory minimum level, which is a solvency margin ratio of 200%.

(10) Foreign exchange rates

This sensitivity represents the impact of an immediate appreciation of Japanese yen as of the end of March 2017. Adjusted net worth is affected by the change in the value of assets and liabilities denominated in foreign currency. The value of existing business would also be affected.

(11) Other

The following points should be noted regarding the sensitivities:

- Frictional costs and the cost of non-hedgeable risks do not change in the sensitivity tests, with the exception of frictional costs, which are changed in terms of (9) required capital.
- Values of subsidiaries and affiliated companies are not changed except in the case of (2) stock and real



estate market value, where the stock value of subsidiaries and affiliated companies are altered.

- The impact of changing more than one assumption at a time is not equal to the sum of the impacts for each assumption.

### 3. Assumptions

#### 3.1 Economic assumptions

We have made economic assumptions in our calculation of MCEV as of the end of March 2017.

##### (1) Risk-free rate

We have used the JGB yields and U.S. Treasury yields as of the end of March 2017 as reference rates for the certainty-equivalent projections.

We have not added a liquidity premium on the risk-free rate as there are no products which are considered to have reasonably predictable and illiquid cash flows and would therefore be appropriate to apply a liquidity premium.

Previously, regarding the extrapolation for ultra-long term risk-free rates where there is no market data, flat forward rates were assumed after the latest market data (40 years for JPY and 30 years for USD). From this year-end disclosure, an ultimate forward rate was applied. More specifically, the ultimate forward rate was set at 3.5% and the last liquid point was set at 40 years (30 years for USD) and, based on Smith-Wilson methodology, forward rates on or after 41 years (31 years for USD) were extrapolated to converge to the ultimate forward rate over 20 years (30 years for USD). These parameters were set primarily in reference to the discussion on Insurance Capital Standard (ICS) being developed by the International Association of Insurance Supervisors (IAIS) for the international capital standard. The reasons for setting the last liquid point at 40 years (30 years for USD) are as follows:

- Government bonds with 40-year maturity (30-year maturity for USD) have high liquidity and observable market data.
- Consistency in valuation between assets and liabilities as Sony Life holds a large amount of government bonds with 30- to 40-year maturity (30-year maturity for USD).

The risk-free rates used in calculation for key terms (on a par-rate basis) are as follows:

Term (years)	JPY			USD		
	March 2017	March 2016 (Restated)	March 2016	March 2017	March 2016 (Restated)	March 2016
1	(0.25%)	(0.15%)	(0.15%)	1.02%	0.58%	0.58%
5	(0.12%)	(0.19%)	(0.19%)	1.92%	1.21%	1.21%
10	0.07%	(0.05%)	(0.05%)	2.39%	1.77%	1.77%
20	0.64%	0.44%	0.44%	2.75%	2.17%	2.17%
30	0.84%	0.55%	0.55%	3.01%	2.61%	2.61%
40	0.96%	0.63%	0.63%	3.04%	2.75%	2.81%
50	1.25%	0.98%	0.70%	3.07%	2.82%	2.92%
60	1.45%	1.23%	0.74%	3.09%	2.86%	2.98%
70	1.57%	1.38%	0.77%	3.11%	2.88%	3.02%
80	1.65%	1.47%	0.79%	3.12%	2.90%	3.04%

(Data: Ministry of Finance Japan for JGB [extrapolated] and Bloomberg for U.S. Treasury [extrapolated])

For the swap rates used for sensitivity in Section 2.7 (1), the last liquid point and convergence period were set the same as the base case. The swap rates used for the sensitivity result (on a par-rate basis) are as follows:

Term (years)	JPY	USD
	March 2017	March 2017
1	0.05%	1.38%
5	0.11%	2.05%
10	0.27%	2.38%
20	0.68%	2.62%
30	0.83%	2.65%
40	0.91%	2.72%
50	1.20%	2.78%
60	1.41%	2.83%
70	1.54%	2.86%
80	1.63%	2.88%

(Data: Bloomberg [extrapolated])

## (2) Interest-rate model

We have calibrated the interest rate model to the market as of the end of March 2017. We have estimated parameters for the interest rate model from the yield curve and the implied volatilities of interest swaptions with different terms. We have used 1,000 scenarios generated by Milliman, Inc. in calculating the time value of options and guarantees under the stochastic method.

The implied volatilities of the interest swaption used in our estimation are presented below.

As of the end of March 2017 (bp)

Term of swap (in years)	Term of option (in years)	Japanese yen	U.S. dollar	Euro	UK pound
1	1	11.9	50.7	28.8	37.4
10	1	21.4	76.1	61.2	73.9
10	10	34.6	71.9	68.2	69.5
10	20	38.9	55.0	56.8	57.9
20	1	32.6	72.3	65.5	73.8
20	10	38.2	63.8	59.5	64.8
20	20	40.6	51.0	46.9	53.0

(Data: Markit)

Until the previous fiscal year, implied volatilities were expressed as a percentage change in interest rates assuming the Black model. As of this fiscal year, they are expressed as a basis point change in interest rates assuming a normal distribution on the Bachelier model.

The implied volatilities as of the end of March 2016 based on the same method are presented below.

As of the end of March 2016 (bp)

Term of swap (in years)	Term of option (in years)	Japanese yen	U.S. dollar	Euro	UK pound
1	1	29.2	60.3	25.0	58.0
10	1	33.5	80.9	63.2	84.5
10	10	44.5	76.5	72.3	70.5
10	20	43.1	59.5	64.5	55.4
20	1	45.9	78.4	72.1	80.1
20	10	48.9	66.7	63.9	64.5
20	20	42.3	53.1	54.9	49.8

(Data: Markit)

## (3) Implied volatilities of foreign exchange rates and stocks

We have obtained spot implied volatilities from options with different terms. Implied volatilities are all those for at-the-money options.

We have assumed that forward implied volatilities in the 11th year and beyond are equal to those in the 10th year for both foreign exchange rates and the stock price index as these derivatives have low liquidities for the

period over 10 years.

Implied volatilities used for the estimation are as follows:

As of the end of March 2017

Term (in years)	Foreign exchange			Stocks			
	U.S. dollar / Japanese yen	Euro / Japanese yen	UK pound / Japanese yen	Japan TOPIX	U.S. S&P	Euro SX5E	UK FTSE
1	9.5%	10.4%	11.1%	17.4%	13.7%	16.7%	13.5%
5	9.9%	11.2%	12.3%	18.3%	19.4%	19.4%	17.8%
10	12.3%	13.0%	11.7%	18.6%	25.0%	20.8%	20.6%

(Data: Bloomberg for foreign exchange and Markit for stocks)

As of the end of March 2016

Term (in years)	Foreign exchange			Stocks			
	U.S. dollar / Japanese yen	Euro / Japanese yen	UK pound / Japanese yen	Japan TOPIX	U.S. S&P	Euro SX5E	UK FTSE
1	9.8%	10.5%	15.0%	20.3%	16.3%	21.1%	18.2%
5	10.6%	12.7%	16.0%	18.7%	21.0%	20.2%	19.6%
10	13.7%	14.5%	14.2%	19.0%	26.4%	20.7%	21.7%

(Data: Bloomberg for foreign exchange and Markit for stocks)

(4) Correlation factors

We have calculated correlation factors from the monthly return of each index for a period of five years from April 2012 to the end of March 2017 as there is no market-consistent data for correlation factors.

As of the end of March 2017

	Japanese yen Interest rate 1Y	U.S. dollar Interest rate 1Y	Euro Interest rate 1Y	UK pound Interest rate 1Y	U.S. dollar / Japanese yen	Euro / Japanese yen	UK pound / Japanese yen	TOPIX	S&P	SX5E	FTSE
Japanese yen Interest rate 1Y	1.00	0.11	0.04	0.26	0.37	0.25	0.40	0.32	0.10	0.27	(0.08)
U.S. dollar Interest rate 1Y	0.11	1.00	0.12	(0.01)	0.24	0.15	0.26	0.17	0.05	0.15	(0.12)
Euro Interest rate 1Y	0.04	0.12	1.00	0.20	0.14	0.37	0.23	0.16	0.07	0.09	(0.00)
UK pound Interest rate 1Y	0.26	(0.01)	0.20	1.00	0.20	0.30	0.34	0.28	0.15	0.34	0.07
U.S. dollar / Japanese yen	0.37	0.24	0.14	0.20	1.00	0.76	0.79	0.67	0.27	0.40	0.14
Euro / Japanese yen	0.25	0.15	0.37	0.30	0.76	1.00	0.79	0.61	0.38	0.30	0.20
UK pound / Japanese yen	0.40	0.26	0.23	0.34	0.79	0.79	1.00	0.71	0.43	0.43	0.09
TOPIX	0.32	0.17	0.16	0.28	0.67	0.61	0.71	1.00	0.62	0.63	0.39
S&P	0.10	0.05	0.07	0.15	0.27	0.38	0.43	0.62	1.00	0.67	0.71
SX5E	0.27	0.15	0.09	0.34	0.40	0.30	0.43	0.63	0.67	1.00	0.70
FTSE	(0.08)	(0.12)	(0.00)	0.07	0.14	0.20	0.09	0.39	0.71	0.70	1.00

(Data: Ministry of Finance Japan for JPY interest rate and Bloomberg for others)

As of the end of March 2016

	Japanese yen Interest rate 1Y	U.S. dollar Interest rate 1Y	Euro Interest rate 1Y	UK pound Interest rate 1Y	U.S. dollar / Japanese yen	Euro / Japanese yen	UK pound / Japanese yen	TOPIX	S&P	SXSE	FTSE
Japanese yen Interest rate 1Y	1.00	(0.40)	(0.02)	0.22	0.23	0.12	0.33	0.25	0.05	0.29	0.01
U.S. dollar Interest rate 1Y	(0.40)	1.00	0.19	(0.14)	0.03	(0.03)	(0.08)	0.10	0.07	0.05	0.00
Euro Interest rate 1Y	(0.02)	0.19	1.00	0.10	0.23	0.44	0.34	0.34	0.40	0.44	0.34
UK pound Interest rate 1Y	0.22	(0.14)	0.10	1.00	0.25	0.23	0.24	0.27	0.10	0.21	0.06
U.S. dollar / Japanese yen	0.23	0.03	0.23	0.25	1.00	0.70	0.75	0.64	0.32	0.39	0.31
Euro / Japanese yen	0.12	(0.03)	0.44	0.23	0.70	1.00	0.83	0.56	0.50	0.36	0.41
UK pound / Japanese yen	0.33	(0.08)	0.34	0.24	0.75	0.83	1.00	0.72	0.58	0.50	0.42
TOPIX	0.25	0.10	0.34	0.27	0.64	0.56	0.72	1.00	0.60	0.62	0.49
S&P	0.05	0.07	0.40	0.10	0.32	0.50	0.58	0.60	1.00	0.76	0.82
SXSE	0.29	0.05	0.44	0.21	0.39	0.36	0.50	0.62	0.76	1.00	0.81
FTSE	0.01	0.00	0.34	0.06	0.31	0.41	0.42	0.49	0.82	0.81	1.00

(Data: Ministry of Finance Japan for JPY interest rate and Bloomberg for others)

(5) Foreign exchange

Assets denominated in foreign currencies and the value of U.S. dollar-denominated products are converted to Japanese yen using the TTM (telegraphic transfer middle exchange rate) as of the end of March 2017.

The table below shows foreign exchange rates of major currencies.

	As of the end of March 2017	As of the end of March 2016
U.S. dollar / Japanese yen	¥112.19	¥112.68
Euro / Japanese yen	¥119.79	¥127.70
UK pound / Japanese yen	¥140.08	¥161.92

### 3.2 Future asset allocation

(1) Asset allocation in the general account

Segment accounting is conducted for individual life insurance and individual annuity based on the classifications of the non-participating product segment, the semi-participating product segment, the interest rate-sensitive whole life insurance segment and the foreign-currency-denominated product segment. Asset allocation in the general account under the stochastic method was determined based on the actual asset allocation in each segment as of the end of March 2017 with an assumption of no changes in asset allocation thereafter.

(2) Asset allocation in the separate account

There are eight funds established in the separate account. The asset allocation for each fund at the beginning of the projection is determined based on the actual fund allocation as of the end of March 2017 and no rebalancing adjustments are applied to maintain the initial fund allocation thereafter.

### 3.3 Other assumptions

Assumptions including mortality and morbidity rates, lapse and surrender rates, and operating expense rates, were developed based on best estimates by product as of the end of March 2017. Best-estimate assumptions are developed to reflect past and current experiences as well as expected experiences in the future. Expected future changes in assumptions should be reflected only when they are supported by sufficient reasons. Except for a deteriorating trend in morbidity rates, no other expected future changes are assumed in the best-estimate assumptions applied. Assumptions were developed as follows:

(1) Mortality and morbidity rates

Developed based on experiences over the past three years. Deteriorating trends in morbidity rates are taken into account for those accidental and health (A&H) products for which deteriorating trends were observed when the experience data were analyzed in conducting the statutory stress test.

(2) Lapse and surrender rates



Lapse and surrender rates for the base case were developed based on experience over the past three years. We have also developed dynamic assumptions in accordance with the level of interest rate or investment performance. The dynamic assumptions are made for the following products:

- Variable life insurance
- Interest rate sensitive whole life insurance
- Semi-participating products
- Non-participating whole life insurance
- Non-participating endowment insurance
- Non-participating educational endowment insurance
- U.S. dollar-denominated insurance

Since we have not identified explicit correlations that relate interest rates or the level of account value against minimum guarantee amount to lapse and surrender rates for policies other than variable insurance, we have developed dynamic surrender rates by examining experience on similar products, and taking into account current domestic and overseas practice. Going forward, we will strive to improve our approach to dynamic surrender assumptions for the relevant products by carefully monitoring experience data and referring to experience with similar products and trends of practice in Japan and other countries.

(3) Flexible premiums

There are no flexible premium products and thus no assumptions were developed.

(4) Renewal rates

Developed based on past experiences. Deterioration in mortality and morbidity rates after renewal due to anti-selection is also reflected.

(5) Operating expense rates

We have developed unit costs of the expenses incurred for maintenance and administration of policies and payments of claims based on the actual operating expenses in the past fiscal year and the depreciation costs over the past three years. For expected system-related expenses in the future, the unit costs reflect the average of depreciation costs over the past three years excluding one-off expenses that are not expected to recur in the future. The one-off expenses excluded from the depreciation costs are ¥1.5 billion (FY2016 base), which are for system revisions.

MCEV Principles require that, where costs of managing the covered business are incurred within group companies, profit or losses to those companies are to be valued on a “look through” basis. In relation to the parent company, Sony Financial Holdings Inc., unit cost includes management administration charges payable to the parent company. In relation to subsidiaries and affiliated companies, unit cost includes the cost incurred at Sony Life to manage those companies. Other look-through effects are not considered.

(6) Effective tax rate

The effective tax rate is set at 28.24% in fiscal years 2016 and 2017 and 28.00% in and after fiscal year 2018.

(7) Consumption tax rate

As a result of bills passed by the Japanese Diet on November 18, 2016 to postpone, until October 1, 2019, the consumption tax increase to 10%, future expenses grew from the reflection of this increase on and after October 1, 2019.

(8) Inflation rate

Inflation rates for the first 40 years were set at 0.376% by referring to a 10-year inflation swap rate and removing the effect of the consumption tax increase. For the 41st year and later, to assure consistency with the extrapolation of ultra-long term risk-free rates, inflation rates were assumed to gradually increase to 2.0% in the 60th year, which is the inflation rate assumed for the ultimate forward rate.

## **4. Calculation Method of MCEV**

### **4.1 Covered business**

The covered business is the business operated by Sony Life, its subsidiaries and its affiliated companies.

### **4.2 Treatment of subsidiaries and affiliated companies**

Our calculations include the following values regarding subsidiaries and affiliated companies in the calculation of adjusted net worth:

- AEGON Sony Life Insurance Co., Ltd. is valued at ¥1.3 billion, which is equal to net asset value plus reserve for price fluctuations and contingency reserve, minus intangible fixed assets, reinsurance credits on modified coinsurance (to be amortized in the future) and Insurance Business Law Article 113 deferred assets, plus the tax effect equivalent on Insurance Business Law Article 113 deferred assets, multiplied by the participation rate.
- Other companies are valued at book value under Japanese GAAP, which is ¥8.0 billion.

There are no other values reflected in the values of subsidiaries and affiliated companies except for the above, and all other results solely reflect Sony Life (on a non-consolidated basis).

### **4.3 Treatment of reinsurance**

As we utilize reinsurance for some in-force business, we reflect reinsurance premiums as expenses and reinsurance benefits and reinsurance commissions as income in the projections. Because part of the reinsurance commissions received on coinsurance-type reinsurance are recognized as a reinsurance debit to defer the recognition of revenue in Japanese GAAP, the reinsurance debit for coinsurance-type reinsurance is added to the adjusted net worth.

### **4.4 Treatment of semi-participating policies**

We have calculated dividends in accordance with the level of future investment returns, based on the same method used to determine the dividend rate for the accounting closure of March 31, 2017, reflecting the present value of certainty-equivalent profit and the time value of options and guarantees.

### **4.5 MCEV**

MCEV is defined as the expected present value of distributable earnings to shareholders generated from assets allocated to the covered business after making appropriate allowance for aggregate risks in the covered business. MCEV is presented as the sum of adjusted net worth and value of existing business.

### **4.6 Adjusted net worth**

Adjusted net worth is calculated as the market value of assets allocated for the covered business in excess of statutory policy reserves and other liabilities as of the valuation date. Based on Japanese GAAP, it is calculated as the total amount of the net assets section on the balance sheets, adding reserve for price fluctuations, contingency reserve, reserve for possible loan losses, reinsurance debit for coinsurance-type reinsurance (future profits to be recognized), unrealized gains or losses on held-to-maturity securities, unrealized gains or losses on policy reserve matching bonds and unrealized gains or losses on land and buildings, less unfunded pension liabilities and intangible fixed assets, and adjusting for the amount of tax effect equivalent to these nine items, on which valuation gains or losses on subsidiaries and affiliated companies are added. Adjusted net worth can be split into required capital and free surplus.

#### **4.7 Required capital**

The MCEV Principles define required capital as the amount of assets that should be held in addition to the assets corresponding to the statutory liability to fulfill in-force policy obligations, which by nature is restricted from distribution to shareholders. The level of required capital should be the larger of the solvency capital to meet the regulatory minimum level or the capital required to meet the internal objectives in terms of marketing or risk management purposes, or to achieve the company's targeted credit rating.

We set our required capital as the larger of the amount of capital required for Japanese regulatory minimum at the solvency margin ratio of 200% or the amount of capital to cover risks based on the internal model on an economic value basis. The latter is larger as of the end of March 2017.

We define the amount of capital to cover risks based on the internal model as the total amount of technical provision and solvency risk capital on an economic value basis in excess of statutory policy reserves (excluding contingency reserves). The solvency risk capital on an economic value basis is calibrated at VaR (99.5%) over one year and based on the internal model, which is a similar but modified model based on EU Solvency II standard method.

The solvency risk capital on an economic value basis as of the end of March 2017 was ¥980.6 billion (after tax). The effective tax rate used to adjust to the after-tax basis is 28.00%. The required capital is ¥1,161.7 billion, which is 3508.7% of the regulatory minimum capital requirement.

We will also revise the internal model itself as appropriate, taking into account domestic and overseas conditions, including developments in international accounting standards, valuation methods of insurance liability on an economic value basis and solvency margin standard trends, as well as the analysis of our internal mortality and morbidity rates data.

Major differences between the internal model approach and EU Solvency II standard formula are as follows:

##### **(1) Market risk**

Market risk quantification follows EU Solvency II standard method in principle. However, we modified risk factors specified in EU Solvency II standard method to make them more suitable in light of the market risk attributes to which we are exposed, where risk factors specified in EU Solvency II method or our previous risk

measure is considered unable to reflect enough of the risk amount at a 99.5% confidence level.

For interest rate risk in Japanese yen, principal component analysis is employed, where yield curve changes are disaggregated into three components—parallel shift, twist and butterfly—and the yield curve is shocked by each component, to capture the risk of yield curve changes more precisely. For other risks, major stress parameters different from EU Solvency II include 45% for listed stocks, 100% for subsidiaries and affiliated companies' stocks, and 35% for currency risk.

(2) Insurance underwriting risk

Quantification of insurance underwriting risks follows the EU Solvency II standard method, with the exception of quantification of morbidity, lapse and catastrophe risks, which follows the QIS4 approach.

(3) Operational risk

EU Solvency II standard method is followed.

(4) Correlation parameters

Correlation parameters follow EU Solvency II standard method except that the correlation parameter between Global and Other equities is set to one to exclude any diversification effect while it is set to 0.75 under EU Solvency II standard method.

#### **4.8 Free surplus**

Free surplus is the amount of adjusted net worth other than that for required capital.

#### **4.9 Value of existing business**

The value of existing business is calculated as the present value of certainty-equivalent profit less the time value of options and guarantees, the frictional costs and the cost of non-hedgeable risks.

#### **4.10 New business value**

New business value represents the value at point of sale of new business acquired during the fiscal year ended March 31, 2017. The definition of new business is consistent with the financial information we have disclosed. New business value does not include the value of new business expected to be acquired in the future. As with the value of in-force business, new business value is calculated as the present value of certainty-equivalent profit less the time value of options and guarantees, frictional costs and the cost of non-hedgeable risks. In addition, other profits and losses reflected unrealized gains or losses in assets purchased prior to acquisition of new business to hedge interest rate risk on new business (pre-hedge gains or losses).

The assumptions used in calculation, other than surrender and lapse rates, consumption tax, economic assumptions and inflation rates, are the same as those used to value in-force business as of the end of the previous fiscal year. The impact of changing these assumptions to those used to value in-force business as of the end of this fiscal year

is included in the line item described in Section 2.6 (8).

The assumptions for lapse and surrender rates and the consumption tax rate are those as of the end of the previous quarter. The timing of the consumption tax increase to 10% is assumed to be April 1, 2017 for new business acquired before December, and October 1, 2019 for new business acquired after January. The impact of changing these assumptions to those used to value in-force business as of the end of this fiscal year is included in the line items described in (8) and (12) under Section 2.6.

In the previous year-end disclosure, economic assumptions and inflation rates were those as of the end of the previous quarter. From this year-end disclosure, economic assumptions and inflation rates as of the end of each month are applied. The impact of changing these assumptions to those used to value in-force business as of the end of this fiscal year is included in the line item described in Section 2.6 (11).

#### **4.11 Present value of certainty-equivalent profit**

The present value of certainty-equivalent profit is the present value of profit based on the future cash flows generated from the covered business. The risk-free rate is used as the assumed investment return on all assets and the discount rate.

The present value of certainty-equivalent profit reflects the intrinsic value of options and guarantees.

#### **4.12 Time value of options and guarantees**

We have calculated the time value of options and guarantees using the stochastic method with risk-neutral scenarios. The time value of options and guarantees is calculated as the difference between the present value of certainty-equivalent profit and the present value of stochastic future profits.

The time value of options and guarantees considers the following items:

- Minimum guarantees of variable life insurance  
The excess of account value over the scheduled policy reserves is attributed to policyholders. However, when the account value is less than the scheduled policy reserves, the cost incurred from executing guaranteed minimum death benefits for variable life insurance is attributed to shareholders.
- Minimum interest rate guarantee for interest rate sensitive whole life insurance  
When the investment return exceeds the assumed interest rate, the outperforming portion is credited to policyholder account value. However, when the investment return underperforms the assumed interest rate, the cost for the difference is attributed to shareholders, as the assumed interest rate is guaranteed.
- Interest dividend for semi-participating products  
When the investment return exceeds the assumed interest rate, the outperforming portion is credited to the fund for policyholder dividends and paid to policyholders every five years as interest dividends. Accordingly, none of such interest gains would be attributed to shareholders, while interest losses would be attributed to shareholders.
- Surrender options

Policyholders have various options in insurance contracts. Reflected among them are the costs of policyholders exercising the right of surrender in the event of increased interest rates. Since we have not identified explicit correlations that relate interest rates or the level of account value against the minimum guarantee amount to lapse and surrender rates for policies other than variable insurance, we have developed dynamic surrender rates by examining experience on similar products, and taking into account current domestic and overseas practices. Going forward, we will strive to improve our approach to dynamic surrender assumptions for the relevant products by carefully monitoring experience data and referring to experience with similar products and trends of practice in Japan and other countries.

#### **4.13 Frictional costs**

We have calculated frictional costs as the present value of investment costs and taxes on assets backing the required capital at each point of time in the future.

#### **4.14 Cost of non-hedgeable risks**

As risks regarding the asymmetric nature of cash flows not reflected in the present value of certainty-equivalent profit are fully reflected in the time value of options and guarantees, we have reflected an allowance for the uncertainty of non-economic assumptions and the portion of economic assumptions considered non-hedgeable with respect to the cost of non-hedgeable risks.

Specifically, we have assumed a risk margin based on the EU Solvency II standard method as the cost of non-hedgeable risks and calculated it using the cost of capital approach. It should be noted that the following points are different from the EU Solvency II standard method:

- Non-hedgeable interest rate risk, which is not subject to risk margin in EU Solvency II, is set to the uncertainty of the risk-free rates beyond the 40th year for Japanese yen and the 30th year for U.S. dollar.
- Morbidity, lapse and catastrophe risk follows the QIS4 approach as described in Section 4.7 (2).
- We have used risk amounts quantified after taking into consideration the risk mitigation effect through policyholder dividends without any adjustments.
- Please refer to Section 4.15 for the cost of capital rate.

#### **4.15 Cost of capital rate**

EU Solvency II has set the cost of capital rate at 6%, which is used for the cost of capital calculation. On the other hand, the CRO (Chief Risk Officer) Forum comprising CROs from leading insurance companies in Europe proposed that 2.5% to 4.5% would be the appropriate level based on several trial calculations. Following the philosophy of the CRO Forum's approach, we have decided to use a cost of capital rate of 2.5 % consistent with the MCEV framework considering Japanese long-term equity risk premiums, the beta of Sony Financial Holdings Inc., and the anticipated impact of Sony Life's equity risk exposure on the beta of Sony Financial Holdings Inc., which is a hedgeable risk. We may revise the method of setting the cost of capital rate in the future, as an industry standard has not yet been established.

## 5. Opinion of Outside Specialist

Sony Life requested Milliman, Inc., an external actuarial consulting firm with expert knowledge in the area of MCEV valuations, to review the methodology, assumptions and calculations. The opinion obtained from Milliman, Inc. is as follows:

Milliman, Inc. (“Milliman”) has been engaged to review the methodology, assumptions and calculations used by Sony Life Insurance Co., Ltd. (“Sony Life”) to determine the Market Consistent Embedded Value (“MCEV”) as of March 31, 2017. Specifically, the scope of our review included the embedded value as of March 31, 2017, the sensitivities, the new business value and the movement analysis from MCEV as of March 31, 2016.

The Board of Directors made a statement in its News Release Form dated May 22, 2017 that the methodology, assumptions and calculations have been made in accordance with the European Insurance CFO Forum Market Consistent Embedded Value Principles<sup>1</sup>, with the following exceptions:

- The reference rate used in the calculations has been defined as the government bond nominal spot rate curve rather than the swap rate curve as stipulated in the MCEV Principles.
- The calculated value of MCEV is the value for the life insurance business of Sony Life only and not the consolidated value of Sony Life’s parent company, Sony Financial Holdings Inc.
- Group MCEV, as prescribed in the MCEV Principles, is not considered in this report, as the report is for Sony Life on a stand-alone basis.
- With respect to Sony Life’s subsidiaries and its equity-method affiliates, Sony Life has not evaluated their life insurance business but reflected the following values in the calculation of adjusted net worth:
  - AEGON Sony Life Insurance Co., Ltd. is valued at net asset value plus reserve for price fluctuations and contingency reserve, minus intangible fixed assets, reinsurance credits on modified coinsurance (to be amortized in the future) and Insurance Business Law Article 113 deferred assets, plus the tax effect equivalent on Insurance Business Law Article 113 deferred assets, multiplied by the participation rate
  - Other companies are valued at book value under Japanese GAAP

Milliman has concluded that the methodology and assumptions used comply with the MCEV Principles except for the points described in the above paragraph. In particular

- The non-economic assumptions have been set with regard to past, current and expected future experience;
- The economic assumptions used in the calculations are internally consistent and consistent with observable market data as per the valuation date;
- The methodology makes an allowance for all the aggregate risks in the covered business. The primary methodologies employed are:
  - a stochastic allowance for the cost of financial options and guarantees
  - a deduction for the cost of non-hedgeable risks
  - a deduction for the frictional costs of the required capital
- For participating insurance contracts, the assumptions and scenarios used in the projections are consistent with actual practice regarding the allocation of profits between policyholders and shareholders, the setting of policyholder dividend rates, and other management actions.

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Milliman has reviewed the MCEV methodology, assumptions, calculations and analysis prepared by Sony Life, but this does not mean that Milliman has conducted a detailed review in all aspects. During its review Milliman identified and discussed various MCEV calculation and definition issues with Sony Life staff. Based upon those discussions and follow-up actions, Milliman is not aware of any issues that would materially impact the disclosed market consistent embedded values, new business values, sensitivities or movement analysis from the prior period. In arriving at this conclusion, Milliman has relied on data and information provided by Sony Life.

The calculation of MCEV is based on numerous assumptions with respect to economic conditions, operating conditions, taxes and other matters, many of which are beyond the control of Sony Life. Although the methodology and assumptions used comply with the MCEV Principles, deviations between projection assumptions and actual experience in the future are to be expected. Such deviations may materially impact the value calculated.

This opinion is made solely to Sony Life in accordance with the engagement letter between Sony Life and Milliman. Milliman does not accept or assume any responsibility, duty of care or liability to anyone other than Sony Life for or in connection with its review work, the opinion Milliman has formed or for any statements set forth in this opinion, to the fullest extent permitted by applicable law.

## 6. Glossary

Term		Definition
A	Appraisal value	Corporate value based on projected cash flows receivable for shareholders from existing business and future new business. It is defined as the current MCEV plus new business value acquired in the future.
	Asymmetric risk	The risk where symmetric upward and downward changes on assumptions do not result in symmetric changes in cash flow. Such risk includes minimum guarantee of variable life insurance and policyholder dividend payment. These risks are evaluated with a stochastic method and presented as a time value of options and guarantees.
B	Best-estimate assumption	The assumption that is most likely to occur in the future.
C	Calibration	To set various stochastic model parameters in a market-consistent manner.
	Cost of capital approach	One of the approaches to calculate the risk margin. The cost of risk is determined by taking the present value of the cost to hold capital required in future periods.
	Cost of non-hedgeable risk	The present value of the cost to hold required capital to cover future non-hedgeable risks. As risks regarding the asymmetric nature of cash flows not reflected in the present value of certainty-equivalent profit are fully reflected in the time value of options and guarantees, we have reflected the following in this cost: allowance for uncertainty of non-economic assumptions and the portion of economic assumptions considered non-hedgeable with respect to the cost of non-hedgeable risks.
E	EU Solvency II	Insurance regulation (economic value-based solvency regulation) which was introduced to the European Union in January 2016.
F	Free surplus	The portion of adjusted net worth other than the required capital.
	Frictional costs	The present value of investment costs and taxes on assets backing the required capital at each point of time in the future.
I	Implied volatility	The expected rate of future variability embedded in current option prices, and represents the expected value of the market against the price fluctuation.
	ICS (Insurance Capital Standard)	The capital standard for internationally active insurance groups (IAIGs) being developed by the International Association of Insurance Supervisors (IAIS).
L	Look through	To measure the impact of an action on an entire business group rather than only on a particular part of the group.
N	Non-financial risk	Examples are mortality risk, longevity risk, disability risk, operating expense risk, surrender risk and operational risk.
	Non-hedgeable non-financial risk	A non-financial risk such that deep and liquid capital markets do not exist to hedge such risk.
	Non-hedgeable risk	Non-hedgeable risk is composed of non-hedgeable financial risk and non-hedgeable non-financial risk.

Term		Definition
O	Options and guarantees	The following are some features of options and guarantees: <ul style="list-style-type: none"> <li>• Policy cash flow would be changed by exercising options granted to the policyholder. An example of such features is the exercise of the surrender option.</li> <li>• It includes guarantee of benefits or policyholder values. An example is guaranteed minimum death benefits for variable life insurance.</li> </ul>
P	Present value of certainty-equivalent profit	Present value of certainty-equivalent profit is the present value of profit based on the future cash flows generated from the covered business.
Q	QIS4	Quantitative Impact Study. Conducted prior to implementation of the EU Solvency II. The fourth study was conducted in May 2008 and is referred to as QIS4.
R	Required capital	The MCEV Principles define required capital as the capital necessary to hold in excess of statutory policy reserves (excluding contingency reserve), and it is considered to be the larger of the solvency capital to meet the statutory required minimum level or the capital necessary to meet internal objectives or to achieve the company's targeted credit rating. The required capital of Sony Life is set as the larger of the amount of capital corresponding to the solvency margin ratio of 200% or the amount of capital to cover risks based on the internal model on an economic value basis.
	Risk-free rate	The reference rate defined in the MCEV Principles. The MCEV Principles state that it should be the swap rate of the currency of cash flows.
	Risk margin	The cost to hold capital to cover non-hedgeable risks reflected in evaluating the insurance liability on an economic value basis.
	Risk-neutral probability	A pseudo probability derived so that the present value of future expected values under multiple scenarios discounted with current risk-free rates is equal to the current value.
	Risk-neutral scenario	An interest rate scenario generated under risk-neutral probabilities.
T	Technical provision	The value of liability on an economic value basis, which equals the present value of best estimate cash flows plus the risk margin.
	Time value and intrinsic value	An option value that has two elements: time value and intrinsic value. Intrinsic value is the option value under certainty-equivalent conditions. Time value is the value of options other than intrinsic value, which is calculated as the difference between the present value of certainty-equivalent profit and the present value of stochastic future profit.
U	Ultimate forward rate	The level of forward rate to which future forward rates are assumed to ultimately converge. It is generally determined in a macro-economic approach.