

## **UNOFFICIAL TRANSLATION**

Although Japan Post Insurance pays close attention to provide English translation of the information disclosed in Japanese, the Japanese original prevails over its English translation in the case of any discrepancy.

May 18, 2018

Company Name: JAPAN POST INSURANCE Co., Ltd.

Representative: Mitsuhiko Uehira, Director and President, CEO, Representative Executive Officer

Stock exchange listing: Tokyo Stock Exchange (Code Number: 7181)

### **Disclosure of European Embedded Value as of March 31, 2018**

Japan Post Insurance Co., Ltd. (“Japan Post Insurance”, Director and President, CEO Mitsuhiko Uehira) discloses its European Embedded Value (“EEV”) results calculated on the basis of the European Embedded Value Principles (“EEV Principles”) as of March 31, 2018 in order to provide additional information as to the current financial position of Japan Post Insurance.

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## **1. Outline of EEV**

### **(1) Embedded Value (“EV”)**

EV provides an estimate of the value of future profits distributable to shareholders from the assets and liabilities of the covered business, excluding any value of new business that is expected to be sold in the future. This value is the sum of the adjusted net worth (“ANW”) and the value of in-force covered business (“VIF”).

The ANW represents the market value of net assets attributed to shareholders and is the sum of the required capital and the free surplus. The VIF is defined as the present value at the valuation date of the expected future profits distributable to shareholders from the in-force covered business and the assets held in respect of insurance policies, including a deduction for the cost of holding the required capital.

The profit pattern of life insurance products is typically that a loss arises at the time of issue, due to acquisition costs, followed by profits arising over the remainder of the term of the business. The profits over the remaining term of the business are typically expected to more than offset the initial losses which arose due to acquisition costs. While profits under the current accounting practices only represents the profit or loss for a single accounting period, the EV includes the present value of future profits from the in-force business. Therefore we consider that the EV is a useful indicator which provides financial information supplementary to the statutory accounting statements.

### **(2) European Embedded Value (“EEV”)**

The EEV Principles were first published in May 2004 by the CFO Forum, a group representing Chief Financial Officers of major European insurance companies, in order to improve consistency and transparency in EV reporting. In addition, the CFO Forum issued supplementary guidance regarding disclosures and sensitivities in October 2005.

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.

### **(3) EEV Approach**

Japan Post Insurance has adopted a market-consistent approach, in which the cash flows arising from assets and liabilities are valued consistently with similar traded market instruments.

Considering disclosure circumstances in Europe and Japan, Japan Post Insurance’s management discloses Japan Post Insurance’s EV in accordance with the EEV Principles using a market-consistent approach.

## **2. Postal Life Insurance Policies**

Japan Post Insurance was established in September 2006, and commenced operations in October 2007, on the basis of the Postal Service Privatization Act of October 2005. Pursuant to the Postal Service Privatization Act, insurance policies held by Japan Post on September 30, 2007 (“Postal Life Insurance policies”) were taken over by the Management Organization for Postal Savings and Postal Life Insurance (“Management Organization”). The Management Organization ceded 100% of its insurance policies to Japan Post Insurance via a reinsurance agreement.

Japan Post Insurance manages the Postal Life Insurance policies ceded from the Management Organization as a block, separate from other policies. In addition, the contingency reserve and reserve for price fluctuations related to the Postal Life Insurance policies are managed separately. An amount equal to 80% of the profits arising from these policies (including profits arising from the release of the contingency reserve and reserve for price fluctuations, and excluding guaranteed policyholder dividend payments and total income taxes), as well as the fixed amount of guaranteed policyholder dividends, is used to determine the reinsurance dividend paid to the Management Organization. The EEV calculations take into consideration the profits net of this reinsurance dividend.

As the profits arising from the release of the contingency reserve and reserve for price fluctuations related to the Postal Life Insurance policies form a part of the reinsurance dividend paid to the Management Organization, the contingency reserve and reserve for price fluctuations related to these policies are included in the VIF, rather than the ANW, as it is assumed that these reserves will be released in the future.

### 3. EEV Results

The EEV of Japan Post Insurance is ¥3,743.3 billion as of March 31, 2018, an increase of ¥387.6 billion from March 31, 2017.

(in billions JPY)

	March 31, 2017	March 31, 2018	Increase (Decrease)
EEV	3,355.6	3,743.3	387.6
Adjusted net worth	1,965.2	2,136.4	171.2
Value of in-force covered business	1,390.4	1,606.8	216.4

	Fiscal year ended March 31, 2017	Fiscal year ended March 31, 2018	Increase (Decrease)
Value of new business	36.8	226.7	189.8

#### (1) Adjusted Net Worth (“ANW”)

The ANW represents the value of net assets attributed to shareholders. This is the market value of net assets in excess of policyholder liabilities and other liabilities. The ANW as of March 31, 2018 is ¥2,136.4 billion, an increase of ¥171.2 billion from March 31, 2017, which is largely due to net income for the fiscal year ended March 31, 2018, and an increase in the retained earnings in liabilities (total of the contingency reserve and reserve for price fluctuations). The breakdown of the ANW is shown in the table below.

(in billions JPY)

	March 31, 2017	March 31, 2018	Increase (Decrease)
Adjusted net worth	1,965.2	2,136.4	171.2
Total net assets on the balance sheet <sup>(*)</sup>	1,527.4	1,595.8	68.4
Reserve for price fluctuation <sup>(**)</sup>	140.2	251.2	110.9
Contingency reserve <sup>(**)</sup>	415.2	449.2	34.0
Others <sup>(***)</sup>	52.6	50.3	(2.2)
Tax effect on the above	(170.3)	(210.2)	(39.9)

<sup>(\*)</sup> As the only subsidiary company is included in covered business described in “Appendix A: EEV Methodology 1. Covered Business”, the total net assets are the total net assets as on the consolidated balance sheet, excluding the total amount of accumulated other comprehensive income. In addition, the board benefit trust reported as treasury stock has been added at book value.

<sup>(\*\*)</sup> Excluding amounts in respect of the Postal Life Insurance policies (i.e. those policies taken over by the Management Organization) that are included in the VIF.

<sup>(\*\*\*)</sup> Unrealized gains and losses on securities, loans, and real estate, general reserve for possible loan losses and unfunded retirement benefit obligations (unrecognized prior service cost and unrecognized actuarial differences), excluding amounts related to insurance policies.

The breakdown of the amounts related to the insurance policies which were excluded when

calculating the ANW is shown in the table below.

(in billions JPY)

	Company aggregate (1)	Related to insurance policies (2)	Adjusted ANW (1) - (2)
Adjusted net worth	9,799.8	7,663.3	2,136.4
Total net assets on the balance sheet <sup>(*)</sup>	1,595.8	-	1,595.8
Reserve for price fluctuation <sup>(*)</sup>	916.7	665.5	251.2
Contingency reserve <sup>(*)</sup>	2,114.3	1,665.0	449.2
Others <sup>(*)</sup>	8,358.4	8,308.0	50.3
Tax effect on the above	(3,185.5)	(2,975.3)	(210.2)

(\*) The total net assets are the total net assets as on the consolidated balance sheet, excluding the total amount of accumulated other comprehensive income. In addition, the board benefit trust reported as treasury stock has been added at book value.

(\*) The amount related to insurance policies (2) consists of amounts in respect of the Postal Life Insurance policies only. Please refer to “2. Postal Life Insurance Policies.”

(\*) Unrealized gains and losses on securities, loans, and real estate (excluding amounts related to insurance policies), general reserve for possible loan losses and unfunded retirement benefit obligations (unrecognized prior service cost and unrecognized actuarial differences).

## (2) Value of In-Force Covered Business (“VIF”)

The VIF represents the present value of future profits distributable to shareholders from the in-force covered business and the assets held in respect of insurance policies as of the valuation date. The March 31, 2018 VIF is ¥1,606.8 billion, an increase of ¥216.4 billion from March 31, 2017, which is primarily due to sale of the new business. The breakdown of the VIF is shown in the table below.

When calculating future profits, the assets in respect of insurance policies are valued using at book value approach. Furthermore, the VIF includes the profits arising from the release of contingency reserve and reserve for price fluctuations related to Postal Life Insurance policies, under the assumption that they will be released in the future. Please refer to “2. Postal Life Insurance Policies”.

(in billions JPY)

	March 31, 2017	March 31, 2018	Increase (Decrease)
Value of in-force covered business	1,390.4	1,606.8	216.4
Certainty equivalent present value of future profits	1,960.1	2,105.5	145.3
Time value of financial options and guarantees	(408.2)	(353.7)	54.4
Cost of holding required capital	(0.0)	(0.0)	(0.0)
Allowance for non-hedgeable risks	(161.4)	(144.8)	16.6

### (3) Value of New Business

Value of new business is the value as at the time of sale of the new business issued in the reporting period (for switchovers, the net increase in value – please refer to “Appendix A: EEV Methodology 8. Value of New Business”). The value of new business consists of the components shown in the table below. The value of new business for the fiscal year ended March 31, 2018 was ¥226.7 billion, an increase of ¥189.8 billion from the fiscal year ended March 31, 2017, due largely to an increase in interest rates used for the valuation of the new business (Please refer to “Appendix B: Main EEV Assumptions 1. Economic Assumptions”) and the revision of insurance premiums.

(in billions JPY)

	Fiscal year ended March 31, 2017	Fiscal year ended March 31, 2018	Increase (Decrease)
Value of new business	36.8	226.7	189.8
Certainty equivalent present value of future profits	97.0	246.3	149.3
Time value of financial options and guarantees	(41.7)	(14.1)	27.6
Cost of holding required capital	(0.0)	-	0.0
Allowance for non-hedgeable risks	(18.3)	(5.4)	(12.9)

The table below shows the new business margin, calculated as the ratio of the value of new business to the present value of new business premiums.

(in billions JPY)

	Fiscal year ended March 31, 2017	Fiscal year ended March 31, 2018	Increase (Decrease)
Value of new business	36.8	226.7	189.8
Present value of new business premium <sup>(*)</sup>	6,058.7	4,150.7	(1,908.0)
New business margin	0.61%	5.46%	4.85 points

<sup>(\*)</sup> Future premium income is discounted by the risk-free rate used for the value of new business calculation.

#### 4. Movement Analysis

(in billions JPY)

	Adjusted net worth	Value of in-force covered business	EEV
Values as of March 31, 2017	1,965.2	1,390.4	3,355.6
(1) Opening adjustments	(36.0)	-	(36.0)
Values as of March 31, 2017 after adjustment	1,929.2	1,390.4	3,319.6
(2) Value of new business	-	226.7	226.7
(3) Expected existing business contribution (risk-free rate)	(3.8)	89.8	86.0
(4) Expected existing business contribution (in excess of risk-free rate)	1.2	25.2	26.4
(5) Expected transfer from VIF to adjusted net worth	143.5	(143.5)	-
On in-force at the beginning of the year	162.9	(162.9)	-
On new business	(19.4)	19.4	-
(6) Non-economic experience variances	3.0	(10.5)	(7.5)
(7) Non-economic assumption changes	-	(1.7)	(1.7)
(8) Economic variances	63.2	30.3	93.5
Values as of March 31, 2018	2,136.4	1,606.8	3,743.3

##### (1) Opening adjustments

This amount includes ¥36.0 billion of shareholder dividends paid during the fiscal year ended March 31, 2018, which reduced the ANW.

##### (2) Value of new business

The value of new business represents the value at the time of sale, after all acquisition-related costs, attributable to new business obtained during the fiscal year ended March 31, 2018.

##### (3) Expected existing business contribution (risk-free rate)

In calculating the VIF, future expected profits are discounted using risk-free rates. Thus, the discounted value grows at the risk-free rate due to the passage of time. This item also includes the release for the fiscal year ended March 31, 2018 of the time value of financial options and guarantees, the cost of holding required capital and the allowance for non-hedgeable risks. In addition, interest on the adjusted net worth at the risk-free rate, which was -0.254%, is included in this item.



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

Rates of future returns are assumed to be risk-free rates in calculating EEV. However, after-tax investment earnings on assets are expected to be in excess of the risk-free rates. This item reflects the expected excess. For detail of the expected investment earnings assumptions for the fiscal year ended March 31, 2018, refer to “Appendix B: Main EEV Assumptions”.

**(5) Expected transfer from VIF to adjusted net worth**

The total expected profit during the fiscal year ended March 31, 2018 is transferred to the adjusted net worth. This item includes both the profit expected to emerge from business in force at the start of the reporting period, as well as the expected emergence of profit or loss arising from the new business issued in the fiscal year ended March 31, 2018, including the impact of acquisition costs.

This item is a transfer from VIF to ANW and does not affect the total EEV.

**(6) Non-economic experience variances**

This item represents the difference between the non-economic assumptions which were used for calculating EEV as of March 31, 2017 and the actual experience during the fiscal year ended March 31, 2018 corresponding to such assumptions.

**(7) Non-economic assumptions changes**

This item quantifies the amount of change attributable to increase/decrease in future profits/losses after March 31, 2018 due to changes made to the non-economic assumptions.

**(8) Economic variances**

This item represents the impact of differences between actual investment returns in the period and the expected investment returns, and the impact on the VIF from the change to the end of period economic assumptions such as interest rates and implied volatilities.

The ANW increased ¥63.2 billion, due largely to gain on sale of fixed assets.

Although interest rates decreased, the VIF increased ¥30.3 billion, due largely to an increase in stock prices and a decrease in implied volatilities.

## 5. Sensitivities

The impact of changes in assumptions (sensitivities) on the EEV is summarized below.

For each sensitivity scenario, only one specific assumption is changed and other assumptions remain unchanged from the base. It should be noted that the effect of a change of more than one assumption at a time is likely to be different from the sum of the relevant individual sensitivity results shown.

(in billions JPY)

	EEV	Change in EEV
Base Scenario March 31, 2018	3,743.3	-
Sensitivity 1 50bp increase in risk-free rate	3,917.1	173.8
Sensitivity 2 50bp decrease in risk-free rate	3,507.5	(235.7)
Sensitivity 3 50bp decrease in risk-free rate (parallel shift without zero floor)	3,402.8	(340.4)
Sensitivity 4 10% decrease in equity and real estate value	3,640.9	(102.3)
Sensitivity 5 10% decrease in maintenance expenses	3,917.4	174.1
Sensitivity 6 10% decrease in surrender and lapse rates	3,788.6	45.3
Sensitivity 7 5% decrease in mortality and morbidity rates for life business	3,859.7	116.4
Sensitivity 8 5% decrease in mortality and morbidity rates for annuity business	3,621.4	(121.8)
Sensitivity 9 Change the required capital to statutory minimum	3,743.3	0.0
Sensitivity 10 25% increase in implied volatilities of equity and real estate values	3,672.6	(70.6)
Sensitivity 11 25% increase in implied volatilities of swaptions	3,645.4	(97.8)

The following table shows the effect on the adjusted net worth of sensitivities 1 through 4.  
Only the VIF is affected in sensitivities 5 through 11 in the above table.

(in billions JPY)

	Change in ANW	Reference: Change for the total company in unrealized gains and losses <sup>(*)</sup>
Sensitivity 1 50bp increase in risk-free rate	(68.9)	(2,530.0)
Sensitivity 2 50bp decrease in risk-free rate	14.5	1,221.8
Sensitivity 3 50bp decrease in risk-free rate (parallel shift without zero floor)	72.8	2,751.4
Sensitivity 4 10% decrease in equity and real estate value	(5.2)	(191.0)

<sup>(\*)</sup> For reference, the table shows the changes for the total company in unrealized gains and losses on assets (net of tax effect). It should be noted that the unrealized gains and losses on assets related to insurance policies are not included in ANW but are included in the calculations of VIF, for calculating EEV.

The sensitivity analysis for the value of new business is summarized below.

(in billions JPY)

	Value of New Business	Change in Value of New Business
Base scenario New business for the fiscal year ended March 31, 2018	226.7	-
Sensitivity 1 50bp increase in risk-free rate	277.3	50.5
Sensitivity 2 50bp decrease in risk-free rate	182.4	(44.2)
Sensitivity 3 50bp decrease in risk-free rate (parallel shift without zero floor)	154.7	(71.9)
Sensitivity 4 10% decrease in equity and real estate value	226.7	-
Sensitivity 5 10% decrease in maintenance expenses	239.7	12.9
Sensitivity 6 10% decrease in surrender and lapse rates	242.7	15.9
Sensitivity 7 5% decrease in mortality and morbidity rates for life business	237.9	11.2
Sensitivity 8 5% decrease in mortality and morbidity rates for annuity business	226.7	(0.0)
Sensitivity 9 Change the required capital to statutory minimum	226.7	-
Sensitivity 10 25% increase in implied volatilities of equity and real estate values	226.2	(0.4)
Sensitivity 11 25% increase in implied volatilities of swaptions	226.5	(0.2)

#### ○ Sensitivity scenario 1: 50bp increase in risk-free rate

- The item represents the effect of an upward parallel shift of 50bp (for all future years) in the yield curve of risk-free forward rates. As prices of bonds, loans, and other assets change, the adjusted net worth changes. Also, as future expected investment yields change, the VIF changes.
- For the long-duration risk-free rate at terms longer than the extrapolation entry term, extrapolation

to the ultimate forward rate is applied without changing the ultimate forward rate itself.

○ **Sensitivity scenario 2: 50bp decrease in risk-free rate**

- The item represents the effect of a downward parallel shift of 50bp (for all future years) in the yield curve of risk-free forward rates. The lower limit in case of the downward parallel shift of positive risk-free forward rates is assumed to be zero. Where the base risk-free forward rate is negative, it is not changed.
- For the long-duration risk-free rate at terms longer than the extrapolation entry term, extrapolation to the ultimate forward rate is applied without changing the ultimate forward rate itself.

○ **Sensitivity scenario 3: 50bp decrease in risk-free rate (parallel shift without zero floor)**

- The item represents the effect of a downward parallel shift of 50bp (for all future years) in the yield curve of risk-free forward rates.
- Different to sensitivity scenario 2, the 50bp downward shift is applied to both positive and negative risk-free rates, without a floor.
- For the long-duration risk-free rate at terms longer than the extrapolation entry term, extrapolation to the ultimate forward rate is applied without changing the ultimate forward rate itself.

○ **Sensitivity scenario 4: 10% decrease in equity and real estate value**

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

○ **Sensitivity scenario 5: 10% decrease in maintenance expenses**

- The item represents the effect of a decrease of 10% in maintenance expenses, i.e. the base rates are multiplied by 90%.

○ **Sensitivity scenario 6: 10% decrease in surrender and lapse rates**

- The item represents the effect of a decrease of 10% in surrender and lapse rates, i.e. the base rates are multiplied by 90%.

○ **Sensitivity scenario 7: 5% decrease in mortality and morbidity rates for life business**

- The item represents the effect of a decrease of 5% in mortality and morbidity rates for life business, i.e. the base rates are multiplied by 95%.

○ **Sensitivity scenario 8: 5% decrease in mortality and morbidity rates for annuity business**

- The item represents the effect of a decrease of 5% in mortality and morbidity rates for annuities business, i.e. the base rates are multiplied by 95%.

○ **Sensitivity scenario 9: Change required capital to statutory minimum**

- The item represents the effect of a change in the level of required capital to the statutory minimum

level in Japan, i.e. a 200% solvency margin ratio.

○ **Sensitivity scenario 10: 25% increase in implied volatilities of equity and real estate**

- The item represents the effect on the time value of financial options and guarantees of an increase of 25% in the implied volatilities of equity and real estate values options.

○ **Sensitivity scenario 11: 25% increase in implied volatilities of swaptions**

- The item represents the effect on the time value of financial options and guarantees of an increase of 25% in the base implied volatilities of swaptions.

## **6. Notes on the Use of Results**

The calculation of EEV results involves certain assumptions regarding the future that are subject to risk and uncertainty, many of which are outside Japan Post Insurance's control. Actual future results might differ materially from the assumptions used in the EEV calculation. Consequently, the inclusion of EEV results herein should not be regarded as a statement by Japan Post Insurance that the stream of future after-tax profits discounted to produce the EEV results will be achieved; the users are strongly advised to exercise caution.

## **Appendix A: EEV Methodology**

The methodology and assumptions adopted by Japan Post Insurance to calculate the EEV results as of March 31, 2018 are market-consistent and in accordance with the EEV Principles and Guidance.

### **1. Covered Business**

All of the life insurance business written through Japan Post Insurance and its subsidiaries is covered in the EEV calculations. Japan Post Insurance has only life insurance business.

Although Japan Post Insurance is a member of the Japan Post group, the EEV in this document is calculated on a solo entity basis.

### **2. ANW**

The ANW is calculated by adjusting the total net assets on Japan Post Insurance's balance sheet for the following:

- Consistent with the EEV Principles, the ANW is calculated at market value. Items on the balance sheet which are not held at market value, such as bonds categorized as "Held to Maturity", real estate and certain other assets, are by principle taken at market value, and differences between the market value and the book value of these items have been added to the ANW on a post-tax basis. However, differences between the market value and the book value of assets in respect of insurance policies, are reflected in the VIF, rather than the ANW.
- Certain liabilities that can be considered effectively part of net assets are added on a post-tax basis to the ANW. In particular, the contingency reserve, reserve for price fluctuations and general reserves for possible loan losses have been added to the ANW on a post-tax basis. However, the corresponding items for Postal Life Insurance policies are not included in the ANW calculation (see "2. Postal Life Insurance Policies").
- In relation to pension benefit obligations, unrecognized prior service cost and unrecognized actuarial differences are reflected in the ANW on a post-tax basis.
- The board benefit trust reported as treasury stock has been added to the ANW at book value. This adjustment is made because, although the stocks of Japan Post Insurance owned by the trust are expected to be paid to retired executive officers and excluded from the amount of treasury stock in the future, the book value is deducted from total net assets on the balance sheet as treasury stock.

Free surplus is the amount of any ANW in excess of the amount of required capital.

### **3. VIF**

The VIF is calculated as the certainty equivalent present value of projected after-tax profits, less deductions for the time value of financial options and guarantees, the cost of holding required capital and an allowance for non-hedgeable risks.

#### **4. Certainty Equivalent Present Value of Future Profits**

The certainty equivalent present value of future profits is the present value of the future cash flows, calculated on a deterministic basis, using best estimate operating assumptions, with all cash flows discounted at the risk-free rate.

When calculating future profits, a book value approach is used, where book value investment returns are projected and adjusted such that the present value of asset cash flows discounted at the risk-free rate is equal to the market value of the assets (compliant with the EEV Principles Guidance 10.11). The certainty equivalent approach is such that future investment risk premiums (e.g., excess investment yield over the risk-free rate, expected from risk assets such as equities and corporate bonds) are not reflected in the EEV and the value of new business. Future profits include the profits arising from the release of the contingency reserve and reserve for price fluctuations related to Postal Life Insurance policies, under the assumption that they will be released in the future. Furthermore, such profits are considered net of the reinsurance dividend paid to the Management Organization (please refer to “2. Postal Life Insurance Policies”). It reflects the intrinsic value of financial options and guarantees (e.g., policyholder dividends), but not the time value of financial options and guarantees; this is calculated separately.

#### **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 using best estimate operating assumptions and the average of the present value of future after-tax profits calculated by stochastic methods where economic assumptions are consistent with current market prices for traded assets.

Elements of the kind described below have been taken into account in calculating the time value of financial options and guarantees:

- **Dividend Options for Participating Business**

For participating business, the amount of profit distributable to shareholders is asymmetric with respect to realized profits and losses. For example, when profits emerge, policyholders' dividends are paid out and shareholders do not receive 100% of the profit. On the other hand, when losses arise, shareholders need to bear the cost of guarantees attached to participating policies. Policyholders' dividends have been assumed as certain percentages of the profit, and future dividend amounts therefore vary according to the economic scenario.

- **Policyholder behavior**

Policyholders have a variety of options against Japan Post Insurance in responding to changes in economic conditions. In this valuation, the cost of changes in the surrender behavior in response to the level of interest rates has been allowed for.

#### **6. Cost of Holding Required Capital**

Life insurance companies are required to hold a certain amount of capital in addition to the statutory liabilities in order to maintain financial soundness. 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



investment expenses incurred for the management of the related assets.

The EEV Principles define the minimum required capital to be equal to the statutory minimum capital requirement and that required capital may include amounts required to meet internal objectives. In Japan, the statutory minimum is a 200% solvency margin ratio (the “Japanese Solvency Margin standard”), and Japan Post Insurance has assumed a level of required capital corresponding to a 600% solvency margin ratio.

Under the Japanese Solvency Margin standard, policy reserves in excess of the full-term Zillmer reserve equivalent can be recognized as a margin item, with some limitation, and this has been reflected in the calculation of required capital.

It should be noted that the contingency reserve and reserve for price fluctuations relating to the reinsured Postal Life Insurance policies are included in the VIF calculation and are also permitted to be recognized as solvency margin. As a result, the values of the required capital as of March 31, 2017 and as of March 31, 2018 were both zero. However, release of such reserves could lead to non-zero required capital in the future.

## **7. Allowance for Non-Hedgeable Risks**

The EEV Principles state that “EV is the present value of shareholders’ interests in the earnings distributable from assets allocated to the covered business after sufficient allowance for the aggregate risks in the covered business.” The EEV Principles require the value to be calculated taking into account all risks. There are some risks for which the existing best estimate assumptions do not allow for the impact on the EEV of the full range of potential outcomes. These risks (e.g., operational risk, catastrophe risk) are taken into account via the allowance for non-hedgeable risks.

Also, tax must be paid when profits arise, while tax must be zero when losses occur in a reporting period. Even if losses arise, the losses on a tax basis can be carried forward to be offset by future profits. However, as losses can be carried forward for a limited period, there is risk that Japan Post Insurance will not be able to take full advantage of the tax benefits from losses carried forward.

Further, the long-duration portion of the risk-free rates used for calculation is uncertain due to the lack of a liquid market for long-duration interest rates. This results in uncertainty in value.

Japan Post Insurance estimated the allowance for non-hedgeable risks with a simple model.

## **8. Value of New Business**

The value of new business for the fiscal year ended March 31, 2018 is the value as at the time of sale of the new business issued. The value of new business includes new business and additional riders. However the renewals of existing policies are excluded from the value of new business. Starting in October 2017, we have introduced Non-participating injury rider and Non-participating general medical care rider contracts which contain a provision permitting switchover from a previous hospitalization rider by means of cancellation of the previous hospitalization rider and simultaneous addition of a Non-participating injury rider and Non-participating general medical care rider. The value of new business of such switchovers reflects the net increase in value as a result of cancellation and replacement. The economic assumptions are as at September 30, 2017 and non-economic assumptions are the same as assumptions used to calculate the

VIF.

For Japan Post Insurance, the actual level of policyholder dividends is determined based on the profit and loss of all in-force business, not on profit and loss for new business alone. Therefore, the value of new business is calculated as the difference between the EV calculated on the basis of the profit and loss for all in-force business including new business issued in the reporting period, and the EV calculated on the basis of the profit and loss for all business that would be in-force if no new business had been issued, i.e. by a marginal approach.

As a result of using a marginal approach, effects such as any reduction of risk due to diversification arising from the sale of new business are included in the value of new business.

## Appendix B: Main EEV Assumptions

### 1. Economic Assumptions

#### (1) Risk-free Rate

##### i. Reference Rate

Based on the assets held by Japan Post Insurance, the risk-free rates for use in the certainty equivalent calculation have been determined based on Japanese government bonds as at the valuation date.

##### ii. Extrapolation of interest rates at long durations

For longer durations for which market-based reference interest rates are not available, we apply an extrapolation approach which utilizes an ultimate forward rate. We have assumed an ultimate forward rate of 3.5%, and as the market of Japanese government bonds beyond 30 years is not considered deep and liquid, we have determined the extrapolation entry term as 30 years. For the forward rate for year 31 and later years, we have applied the Smith-Wilson approach with convergence to the ultimate forward rate over 30 years.

The table below shows, for selected terms, the risk-free rates (converted to spot rates) used for the calculation.

Risk-free rates for calculation of the VIF:

Term (Years)	March 31, 2017	March 31, 2018
1	(0.254)%	(0.134)%
2	(0.204)%	(0.137)%
3	(0.179)%	(0.118)%
4	(0.148)%	(0.118)%
5	(0.124)%	(0.108)%
10	0.068%	0.043%
15	0.375%	0.293%
20	0.663%	0.542%
25	0.828%	0.709%
30	0.881%	0.778%
40	1.271%	1.194%
50	1.682%	1.620%
60	1.978%	1.926%

Source: Analysis of Ministry of Finance data

Risk-free rates for calculation of the value of new business:

Term (Years)	Fiscal year ended March 31, 2017 (Rate at September 30, 2016)	Fiscal year ended March 31, 2018 (Rate at September 30, 2017)
1	(0.318)%	(0.134)%
2	(0.289)%	(0.120)%
3	(0.286)%	(0.105)%
4	(0.265)%	(0.093)%
5	(0.249)%	(0.078)%
10	(0.083)%	0.062%
15	0.144%	0.335%
20	0.376%	0.599%
25	0.465%	0.837%
30	0.472%	0.899%
40	0.909%	1.281%
50	1.387%	1.689%
60	1.732%	1.985%

Source: Analysis of Ministry of Finance data

## (2) Economic Assumptions (for Risk Neutral Economic Scenarios)

### a) Interest rate model

Japan Post Insurance has adopted a single-factor Hull-White model, in which interest rates associated with Japanese yen (“JPY”), U.S. dollars (“USD”), Euro (“EUR”) and Australian dollars (“AUD”) (\*1) are calculated. The model has been adjusted to be in line with a risk-neutral approach in which Japanese yen is set as a base currency, with correlations between the interest rates also taken into account. The interest rate model has been calibrated consistent with the market environment as of the valuation date, and parameters used are estimated from the yield curve and implied volatilities of interest rate swaptions with various maturities. A set of 5,000 scenarios is used in calculating the time value of financial options and guarantees utilizing stochastic methods. These scenarios have been generated by Willis Towers Watson.

A summary of the implied volatilities of interest rate swaptions used to calibrate the scenarios is as follows.

(\*1) Japan Post Insurance has changed the currencies for EEV calculation based on the composition of its foreign currency-denominated assets by currency for the fiscal year ended March 31, 2018. The EEV as of March 31, 2017 and the value of new business for the fiscal year ended March 31, 2017 were computed using a single-factor Hull-White model to model the interest rates associated with JPY, USD, EUR and pounds sterling (“GBP”).

Implied volatility used for the calculation of the VIF <sup>(\*)</sup>:

		March 31, 2017				March 31, 2018			
Option Term (Years)	Swap Term (Years)	JPY	USD	EUR	GBP	JPY	USD	EUR	AUD
5	5	27.0bp	83.1bp	69.1bp	79.8bp	21.4bp	75.3bp	62.8bp	62.6bp
5	7	28.7bp	81.8bp	70.0bp	78.3bp	22.8bp	72.6bp	62.5bp	62.0bp
5	10	31.7bp	80.0bp	70.8bp	76.0bp	25.2bp	71.7bp	61.7bp	60.7bp
7	5	30.4bp	80.9bp	71.6bp	77.8bp	24.6bp	72.5bp	64.3bp	63.2bp
7	7	31.3bp	79.9bp	71.6bp	75.9bp	25.9bp	70.7bp	63.8bp	61.9bp
7	10	33.3bp	76.7bp	71.4bp	73.4bp	27.4bp	68.1bp	62.9bp	59.8bp
10	5	33.4bp	76.2bp	71.8bp	73.5bp	28.0bp	68.5bp	63.7bp	63.7bp
10	7	33.9bp	74.8bp	71.0bp	72.2bp	29.2bp	66.4bp	63.3bp	61.2bp
10	10	35.7bp	71.8bp	69.6bp	69.5bp	30.3bp	64.0bp	62.4bp	58.6bp

Source: Bloomberg

Implied volatility used for the calculation of the value of new business <sup>(\*)</sup>:

		Fiscal year ended March 31, 2017 (Volatility at September 30, 2016)				Fiscal year ended March 31, 2018 (Volatility at September 30, 2017)			
Option Term (Years)	Swap Term (Years)	JPY	USD	EUR	GBP	JPY	USD	EUR	AUD
5	5	—	88.0bp	62.4bp	83.3bp	23.8bp	77.0bp	65.3bp	70.8bp
5	7	30.5bp	86.9bp	66.9bp	83.5bp	25.4bp	76.2bp	66.0bp	73.6bp
5	10	32.1bp	85.1bp	70.6bp	84.1bp	28.0bp	75.3bp	66.2bp	76.2bp
7	5	32.0bp	85.9bp	69.2bp	83.1bp	27.0bp	76.5bp	68.1bp	72.3bp
7	7	32.7bp	84.3bp	70.6bp	81.0bp	27.7bp	75.2bp	68.1bp	75.0bp
7	10	33.2bp	86.1bp	71.6bp	81.8bp	30.3bp	73.5bp	68.1bp	78.5bp
10	5	34.8bp	73.0bp	72.3bp	77.2bp	30.5bp	75.9bp	68.8bp	73.1bp
10	7	34.8bp	72.8bp	72.1bp	76.1bp	30.2bp	74.0bp	68.5bp	76.9bp
10	10	34.8bp	76.2bp	—	79.4bp	32.7bp	69.7bp	67.6bp	81.6bp

Source: Bloomberg

<sup>(\*)</sup> We have changed the data source from the Black model-basis to the Normal model-basis from March 31, 2017. The data of the previous year are converted to Normal model-basis for comparison purposes.

b) Implied volatilities of equities and currencies

Volatilities of major equity indices and currencies are calibrated based on implied volatilities of relevant options traded in the market. Implied volatilities used to calibrate the scenarios are shown below. Japan Post Insurance has made adjustments based on the implied volatilities of these indices, taking into account the asset composition at the valuation date. As TOPIX is the main benchmark index used by Japan Post Insurance for managing Japanese equity assets, the actual JPY volatilities used for the calculation are derived by taking the Nikkei 225 implied volatilities shown below and multiplying them by the historical volatility ratio of TOPIX to the Nikkei 225 (92.8% as of March 31, 2017 and 92.5% as of March 31, 2018).

Stock Options

Implied volatilities used for calculation of the VIF:

Currency	Underlying asset	Option Term	Volatility at March 31, 2017	Volatility at March 31, 2018
JPY	Nikkei 225	3 year	19.4%	18.5%
		4 year	19.4%	18.5%
		5 year	19.4%	18.6%
USD	S&P 500	3 year	17.1%	18.6%
		4 year	18.4%	19.2%
		5 year	19.7%	19.9%
EUR	Euro Stoxx 50	3 year	18.6%	16.2%
		4 year	19.1%	16.4%
		5 year	19.6%	16.6%

Source: Analysis of Markit data

Implied volatilities used for calculation of the value of new business:

Currency	Underlying asset	Option Term	Fiscal year ended March 31, 2017 (Volatility at September 30, 2016)	Fiscal year ended March 31, 2018 (Volatility at September 30, 2017)
JPY	Nikkei 225	3 year	20.1%	18.3%
		4 year	19.9%	18.7%
		5 year	19.9%	18.9%
USD	S&P 500	3 year	18.6%	16.3%
		4 year	19.7%	17.3%
		5 year	21.0%	18.3%
EUR	Euro Stoxx 50	3 year	20.2%	17.2%
		4 year	20.2%	17.7%
		5 year	20.3%	18.2%

Source: Analysis of Markit data

## Currency

Implied volatilities used for calculation of the VIF:

Currency	Option Term	Volatility at March 31, 2017	Volatility at March 31, 2018
USD	10 year	12.3%	10.7%
EUR	10 year	12.5%	11.0%
GBP	10 year	11.7%	-
AUD	10 year	-	15.8%

Source: Bloomberg

Implied volatilities used for calculation of the value of new business:

Currency	Option Term	Fiscal year ended March 31, 2017 (Volatility at September 30, 2016)	Fiscal year ended March 31, 2018 (Volatility at September 30, 2017)
USD	10 year	14.1%	11.7%
EUR	10 year	13.4%	12.5%
GBP	10 year	14.2%	-
AUD	10 year	-	15.8%

Source: Bloomberg

### c) Correlations

In addition to implied volatilities described above, Japan Post Insurance has calculated implied volatilities reflecting its asset portfolio and correlation factors. With regard to correlation factors, market-consistent data from exotic options with sufficient liquidity is not available. Therefore, the correlation factors are estimated based on historical market data. Specifically, the monthly data for the most recent 10 years at the valuation date have been used. The following table shows correlation factors between major variables.



Correlations used for the calculation of the VIF:

	JPY yield (10 year)	USD yield (10 year)	EUR yield (10 year)	AUD yield (10 year)	Exchange rate/USD	Exchange rate/EUR	Exchange rate/AUD	Japanese Stock Index/JPY	Foreign Stock Index/JPY
JPY yield (10 year)	1.00	0.56	0.50	0.45	0.37	0.19	0.17	0.31	0.28
USD yield (10 year)	0.56	1.00	0.78	0.76	0.42	0.32	0.27	0.36	0.40
EUR yield (10 year)	0.50	0.78	1.00	0.68	0.23	0.42	0.33	0.33	0.39
AUD yield (10 year)	0.45	0.76	0.68	1.00	0.41	0.49	0.53	0.46	0.52
Exchange rate/USD	0.37	0.42	0.23	0.41	1.00	0.64	0.54	0.59	0.59
Exchange rate/EUR	0.19	0.32	0.42	0.49	0.64	1.00	0.84	0.67	0.79
Exchange rate/AUD	0.17	0.27	0.33	0.53	0.54	0.84	1.00	0.72	0.85
Japanese Stock Index/JPY	0.31	0.36	0.33	0.46	0.59	0.67	0.72	1.00	0.84
Foreign Stock Index/JPY	0.28	0.40	0.39	0.52	0.59	0.79	0.85	0.84	1.00

Source: Ministry of Finance for JPY yields, Bloomberg for others

Correlations used for the calculation of the value of new business:

	JPY yield (10 year)	USD yield (10 year)	EUR yield (10 year)	AUD yield (10 year)	Exchange rate/USD	Exchange rate/EUR	Exchange rate/AUD	Japanese Stock Index/JPY	Foreign Stock Index/JPY
JPY yield (10 year)	1.00	0.57	0.49	0.45	0.40	0.19	0.19	0.32	0.29
USD yield (10 year)	0.57	1.00	0.78	0.75	0.47	0.33	0.30	0.39	0.44
EUR yield (10 year)	0.49	0.78	1.00	0.68	0.27	0.43	0.32	0.34	0.41
AUD yield (10 year)	0.45	0.75	0.68	1.00	0.43	0.50	0.53	0.46	0.52
Exchange rate/USD	0.40	0.47	0.27	0.43	1.00	0.63	0.55	0.61	0.62
Exchange rate/EUR	0.19	0.33	0.43	0.50	0.63	1.00	0.83	0.66	0.78
Exchange rate/AUD	0.19	0.30	0.32	0.53	0.55	0.83	1.00	0.72	0.85
Japanese Stock Index/JPY	0.32	0.39	0.34	0.46	0.61	0.66	0.72	1.00	0.84
Foreign Stock Index/JPY	0.29	0.44	0.41	0.52	0.62	0.78	0.85	0.84	1.00

Source: Ministry of Finance for JPY yields, Bloomberg for others

### (3) Expected Future Asset Portfolio

Future asset purchases are assumed to be invested according to the duration characteristics of the liabilities, with consideration of the actual asset portfolio at the valuation date.

In addition, all foreign assets have been assumed to be USD, EUR or AUD denominated based on the composition of foreign assets within the portfolio to calculate the EEV as of March 31, 2018 and the value of new business for the fiscal year ended March 31, 2018.

It should be noted that all foreign assets have been assumed to be USD, EUR or GBP denominated, based on the composition of foreign assets within the portfolio to calculate the EEV as of March 31, 2017 and the value of new business for the fiscal year ended March 31, 2017. Japan Post Insurance has changed the currencies for calculation, following the change of the composition of foreign currency denominated assets by currency.

### (4) Expected Investment Earnings Assumptions

The expected investment earnings assumptions (the total including the risk-free rate) that are used to calculate the value of the expected existing business contribution in the movement analysis for the fiscal year ended March 31, 2018 are as follows for major asset categories:

Asset	Expected Earning
Government bonds	(0.254)%: 1 year JGB rate
Cash and deposits, call loans	(0.254)%: 1 year JGB rate
Local bonds	(0.204)%: 1 year JGB rate + credit spread of 0.050%
Government-backed bonds	(0.214)%: 1 year JGB rate + credit spread of 0.040%
Corporate bonds	(0.154)%: 1 year JGB rate + credit spread of 0.100%

The expected investment earnings assumption that is used to calculate the value of the expected existing business contribution is calculated by multiplying the asset allocation ratios as of March 31, 2017 by the aforementioned expected investment earnings assumptions. The expected investment earnings assumption for the entire company after considering the asset allocation ratios is -0.111%.

## **2. Non-Economic Assumptions**

All cash flows (premiums, expenses, claims and benefits, cash surrender values, taxes, etc.) are projected applying the best estimate assumptions up to the termination of the policies. Best estimate assumptions are specified by product group, considering past, current, and expected future experience.

### **Expenses**

- Operating expense assumptions have been set based on actual expense experience. A look-through approach has been applied for Japan Post Insurance's subsidiaries. Adjustments were made to eliminate one-off expenses (e.g. expenses for measures to contribute to future work efficiency improvement) which are not expected to be regularly repeated in the future, and to include expenses which are expected to be additionally incurred in the future. No future productivity gains are assumed.
- The future consumption tax rate is assumed to be 8% until September 2019 and 10% from October 2019 onwards.
- The future inflation rate is assumed to be zero up to the extrapolation entry term of the risk-free rate (year 30). For terms longer than the extrapolation entry term of the risk-free rate, the inflation rate follows growth in the forward rate, converging to an ultimate rate of 2%.

### **Policyholder Dividends**

- Policyholder dividend rates are set based on the current dividend policy. For Postal Life Insurance policies, rates for the reinsurance dividend payable to the Management Organization are set based on the reinsurance agreement with the Management Organization.

### **Effective Tax Assumptions**

- Based on the most recent effective tax rates, the effective tax rates are set as follows:  
Fiscal year ended March 31, 2017 and 2018: 28.24%  
Fiscal year ended March 31, 2019 and later: 28.00%

## **Appendix C: Third Party Opinion**

Japan Post Insurance requested Willis Towers Watson, an independent actuarial firm, to review the calculation of Japan Post Insurance'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, 2018 for Japan Post Insurance. The review covered the embedded value as at March 31, 2018, the value of new business issued in the fiscal year 2017, the analysis of movement in the embedded value during the fiscal year 2017 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 and Guidance. In particular:

- The methodology makes allowance for the aggregate risks in the covered business through Japan Post Insurance's bottom-up methodology as described in this document, which includes a stochastic allowance for financial options and guarantees, and deductions to allow for the cost of holding required capital and the impact of non-hedgeable risks;
- The operating assumptions have been set with appropriate regard to past, current and expected future experience;
- The economic assumptions used are internally consistent and consistent with observable market data; and
- For participating business, the assumed policyholders' dividend rates, and the allocation of profit between policyholders and shareholders, are consistent with the projection assumptions, established company practice and local market practice.

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 Japan Post Insurance, including estimates for the market value of assets for which no market prices exist.

This opinion is made solely to Japan Post Insurance 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 Japan Post Insurance for or in connection with its review work, the opinions it has formed, or for any statement set forth in this opinion.

## Glossary

Terminology	Description
Allowance for non-hedgeable risks	An allowance for insurance, operational, and other non-hedgeable non-financial risks which are not covered by the best estimate assumptions, and for non-hedgeable financial risks. The EEV Principles require all risks inherent in the covered business to be taken into account, and an explicit allowance for non-hedgeable risks is commonly made.
Best estimate assumption	A projection assumption which is developed based on experience data up to the present and expected future experience, and which produces the expected outcome.
Certainty equivalent present value of future profits	The present value of the future cash flows, calculated on a deterministic basis, based on best estimate operating assumptions, and assuming that all assets earn the risk-free rate and all cash flows are discounted at the risk-free rate. Book value approaches, where book value investment returns are projected and adjusted such that the present value of asset cash flows discounted at the risk-free rate is equal to the market value of the assets may also be applied.
Cost of holding required capital	The cost to maintain a certain level of capital, in excess of policy reserves, required to continue the life insurance businesses. The value consists of the taxation costs and investment expenses on the assets backing required capital, assuming that the investment return and the risk discount rate are equivalent to the risk-free rate under the market-consistent approach.
European Solvency II regime	The new economic-value-based solvency regulation framework introduced by the European Commission uniformly within the European Union from January 2016.
Free surplus	The amount of any adjusted net worth in excess of the amount required to be maintained for continuing the life insurance business (i.e., required capital).
Look-through approach	An approach such that when a subsidiary or related company within the group is involved in a transaction related to the management etc. of the covered business, the profits and losses arising from that transaction are reflected in the EEV.
Management Organization for Postal Savings and Postal Life Insurance (referred to as the “Management Organization” in the document)	Management Organization for Postal Savings and Postal Life Insurance was set up on October 1, 2007 to manage the insurance policies issued by Japan Post before September 30, 2007 (referred to as “Postal Life Insurance policies” in the document). Japan Post Insurance is responsible for all of the insurance

Terminology	Description
	obligations of the Postal Life Insurance policies through its reinsurance agreement with Management Organization for Postal Savings and Postal Life Insurance.
Postal Service Privatization	<p>Under the Postal Service Privatization Act, on October 1, 2007 Japan Post was privatized and split into five entities (Japan Post Holdings Co., Ltd., Japan Post Service Co., Ltd., Japan Post Network Co., Ltd., Japan Post Bank Co., Ltd., and Japan Post Insurance Co., Ltd.).</p> <p>Further, the Act for Partial Revision of the Postal Service Privatization Act and Others was passed, such that on October 1, 2012 Japan Post Service Co., Ltd. and Japan Post Network Co., Ltd. were merged to form Japan Post Co., Ltd.</p> <p>On November 4, 2015, Japan Post Holdings Co., Ltd., Japan Post Bank Co., Ltd., and Japan Post Insurance Co., Ltd. became listed companies on the Tokyo Stock Exchange.</p>
Stochastic approach	An approach to project a range of possible future outcomes applying certain probability distribution models. In the calculation of the time value of financial options and guarantees, a set of scenarios are generated based on a probability model and each scenario is applied to project future cash flows.
Time value of financial options and guarantees	<p>An option feature consists of two elements of value: intrinsic value and time value. The intrinsic value is the value of the option under conditions at the valuation date.</p> <p>The intrinsic value may increase during the period to expiry of the option. The added value associated with this change is the time value.</p>
Ultimate forward rate	A long-term interest rate applied when the forward rate is assumed to converge over a period of time to a fixed ultimate level, commonly set based on macroeconomic or other methods.