

## **European Embedded Value (EEV) 2006**

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## **1 Introduction**

Hannover Rückversicherung AG (Hannover Re) is a member company of the CFO Forum, which in May 2004 published the European Embedded Value (EEV) Principles with the intention of improving the transparency and comparability of embedded value reporting across Europe. The Board of Hannover Re has adopted these Principles together with the Additional Guidance on European Embedded Value Disclosures published in October 2005 in respect of the life and health reinsurance business.

Hannover Re first disclosed EEV results in respect of the year ending 2005. The methodology for the 2006 results has been further refined to be market consistent. The majority of assumptions, as far as possible, have been calibrated to observable market prices. All assets are assumed to earn the risk free return based on the appropriate swap curve at the valuation date (i.e. certainty equivalent approach) and an explicit allowance has been made for the Cost of Non-Financial Risks (CoNFR). The 2005 EEV results have been restated on a consistent basis.

The majority of the treaties written by Hannover Re do not contain any significant financial options or guarantees. The time value of options and guarantees for a few treaties originating in the US has been determined using stochastic projections. A stochastic approach is not necessary in respect of other treaties with interest guarantees as the liabilities are backed by matching assets.

The Directors of Hannover Re acknowledge their responsibility for the preparation of the supplementary information in accordance with the EEV Principles.

B&W Deloitte GmbH, independent actuaries and consultants, has been engaged to review the EEV. The scope and conclusions of this review are shown at the end of the document.

The EEV disclosure should not be viewed as a substitute for Hannover Re's primary financial statements.

## **2 Covered Business**

The covered business includes the business reported in the Life & Health Segment of Hannover Re's (Hannover Life Re) published financial statements with the exception of a few life reinsurance treaties which historically were written by companies outside the Life & Health business centres.

This disclosure document generally shows the total results as well as a breakdown for the domestic and foreign operations.

The Domestic Operations include the business written directly by Hannover Rückversicherung AG and E+S Rückversicherung AG in Hannover and the life and health business written by the branches in Paris, Stockholm, Kuala Lumpur and Hong Kong. Business retroceded by the foreign operations to Hannover Re is also included under Domestic Operations.

The Foreign Operations include the life reinsurance subsidiaries of Hannover Re in the UK, Ireland, the United States, Africa and Australia.

Hannover Life Re writes the following lines of business: Individual Life and Group Life, Standard, Impaired and Enhanced Annuities, Disability Income, Critical Illness, Long-Term Care, Medical Supplement, Medicare, and Special (Personal Accident) Risks.

All the values shown in the disclosure are net of intra-group and external retrocessions. In the case of intra-group retrocessions, this means that the retroceded business is excluded by the ceding company and included by the receiving company. The values shown are post tax and before or after minority interests as stated.

The consolidation adjustments shown in the disclosure allow for the elimination of the book values of the foreign life and health subsidiaries for which an EEV has been determined.

### 3 European Embedded Value 2006 and its Components

#### 3.1 EEV 2005 and 2006

The EEV result as at 31 December 2006 is EUR 1,518.3 million, which represents a strong growth of 16.3% relative to the restated 2005 EEV.

According to the EEV Principles the composition of the EEV is:

$$\text{EEV} = \text{SNW} + \text{PVFP}.$$

The following abbreviations are used:

FS: Free Surplus

RC: Required Capital,

hereunder always being the Statutory Minimum Solvency Margin (MSC)

CoC(RC): Cost of Capital

PVFP: Present Value of Future Profits

SNW: Shareholders' Net Worth = FS + RC – CoC(RC)

The PVFP contains the following components:

PVFP(CE): the PVFP based on a certainty equivalent approach including Pension Deficits (PD) and Look Through (LT)

CoNFR: the Cost of Non-Financial Risks

FOGs: the Time Value of Financial Options and Guarantees

The above formula for the EEV can then be rewritten as:

$$\text{EEV} = \text{FS} + (\text{RC} - \text{CoC(RC)}) + \text{PVFP(CE)} - \text{CoNFR} - \text{FOGs}$$

Tables 1 and 2 below show the EEV before and after consolidation adjustments.

**Table 1: Restated EEV 2005 (after allowance for initial adjustments, on a market consistent basis and before minorities)**

EUR million	FS	RC = MSC	CoC	SNW	PVFP	EEV	Consol.	EEV after Consol.
<b>Domestic Operations</b>	387.7	228.0	14.8	600.9	568.4	1,169.3		
<b>Foreign Operations</b>	228.1	182.3	25.1	385.2	319.2	704.4		
<b>Total</b>	<b>615.8</b>	<b>410.2</b>	<b>39.9</b>	<b>986.1</b>	<b>887.6</b>	<b>1,873.7</b>	<b>-567.9</b>	<b>1,305.9</b>

The restated EEV 2005 after consolidation and minorities is EUR 1,110.7 million.

Further information about the restatement can be found in section 5.

**Table 2: EEV 2006 (before minorities)**

EUR million	FS	RC = MSC	CoC	SNW	PVFP	EEV	Consol.	EEV after Consol.
<b>Domestic Operations</b>	203.0	478.9	22.1	659.9	617.4	1,277.3		
<b>Foreign Operations</b>	251.8	213.1	26.2	438.7	373.4	812.2		
<b>Total</b>	<b>454.8</b>	<b>692.0</b>	<b>48.2</b>	<b>1,098.6</b>	<b>990.9</b>	<b>2,089.5</b>	<b>-571.2</b>	<b>1,518.3</b>

The EEV 2006 after consolidation and minorities is EUR 1,311.0 million.

### 3.2 Highlights 2006

The following table shows the strong EEV performance in 2006 relative to the restated EEV 2005.

**Table 3: Highlights EEV 2006**

Before Minorities	Before Consolidation			After Consol.
	Domestic Operations	Foreign Operations	Total	Total
EUR million and as a percentage of restated EEV 2005				
<b>EEV 2005 (restated)</b>	1,169.3 100.0%	704.4 100.0%	1,873.7 100.0%	1,305.9 100.0%
<b>Operating Embedded Value Earnings</b>	67.2 5.7%	134.6 19.1%	201.8 10.8%	185.6 14.2%
<b>Embedded Value Earnings</b>	73.6 6.3%	149.1 21.2%	222.8 11.9%	222.8 17.1%
<b>Change in EEV 2005 / 2006 before capital movements</b>	55.9 4.8%	123.3 17.5%	179.2 9.6%	179.2 13.7%
<b>Change in EEV 2005 / 2006</b>	108.0 9.2%	107.8 15.3%	215.8 11.5%	212.4 16.3%

## Return on EEV

The return on EEV is defined as

$$\text{Return on EEV (2006)} = \frac{\text{EEV(2006)} - \text{Capital Movements} - \text{EEV(2005 restated)}}{\text{EEV(2005 restated)}}$$

$$= 13.7\%$$

$$\text{Return on EEV (2005)} = 11.3\%$$

The values are after consolidation and before minorities.

## 3.3 PVFP 2006 – Breakdown

The following table shows the breakdown of the PVFP between Life / Annuity and Health / Personal Accident (PA) business.

**Table 4: PVFP (before minorities)**

EUR million	Domestic Operations	Foreign Operations	Total
Life / Annuity	568.6	344.8	913.4
Health / PA	48.8	28.6	77.4
<b>Total</b>	<b>617.4</b>	<b>373.4</b>	<b>990.9</b>

The major product lines shown above include a wide variety of different reinsurance contracts. As well as differentiating the business by the type of risk covered, it is also possible to distinguish between treaties that only provide risk cover and those that also include financing to cover the ceding companies' acquisition expenses.

The PVFP for treaties providing risk cover and financing respectively is shown in the following table:

**Table 5: PVFP (before minorities)**

EUR million	Domestic Operations	Foreign Operations	Total
Risk Treaties	131.4	293.7	425.0
Financing Treaties	486.1	79.8	565.9
<b>Total</b>	<b>617.4</b>	<b>373.4</b>	<b>990.9</b>

## 3.4 Financial Options and Guarantees, Look Through and Pension Deficits

### Financial Options and Guarantees (FOGs)

All significant FOGs in Hannover Life Re's portfolio originate from the US market and are mainly due to guarantees under interest sensitive products. The value of FOGs shown for the Domestic Operations results from the retrocessions from the US subsidiary to Hannover Re. The non-US treaties with interest guarantees either have assets matching the liabilities (e.g.

impaired life annuities in the UK) or are not material (e.g. Italian financing treaties covering participating business). Overall, as can be seen from following table, FOGs have a small impact on the PVFP and hence on the EEV:

**Table 6: Time Value of Financial Options and Guarantees (Before Minorities)**

EUR million	Domestic Operations	Foreign Operations	Total	in % EEV
<b>31 December 2005</b>	0.4	3.7	4.1	0.3
<b>31 December 2006</b>	0.7	8.9	9.6	0.6

## Look Through

The level of services provided to the operating companies by service companies within Hannover Re is not material. Consequently, the EEV calculations do not explicitly allow for the profits generated within such service companies.

## Pension Deficits

Pension liabilities for all the foreign operations and the majority of the domestic operations are based on defined contribution plans or reinsured outside of the group. Pension Deficits merely arise from a small part of the pension liabilities for the domestic operations.

**Table 7: Pension Deficits/ Domestic Operations in EUR million**

31 December 2005	31 December 2006
0.2	0.2

## 3.5 Participating Business

Hannover Life Re has a few reinsurance treaties (see below) where the returns to the reinsurer are dependent on a profit participation in the underlying products. The gross written premiums and the contribution to the PVFP of these treaties are not material, and therefore, the profit participation elements have not been modelled explicitly.

### Domestic Operations

1.0% of the gross written premium for the domestic operations derives from traditional Italian products with profit participation.

### Foreign Operations

HLR UK has reinsured small volumes of with profit low-cost endowment business.

HLR US reinsures a small volume of business under which dividends are paid to policyholders.

## 4 New Business

### 4.1 Value of New Business

The following table shows the value of new business (VNB) before and after minorities for the year 2006. PVNB is the present value of the new business profits (or losses) at the point of sale after CoNFR.

**Table 8: Value of New Business**

EUR million	Before Minorities			After Minorities
	Domestic Operations	Foreign Operations	Total	Total
Profit/Loss on New Business during year	-107.8	-13.3	-121.1	-101.2
PVNB	145.9	51.8	197.7	169.7
- CoC(RC)	6.6	4.4	11.0	9.9
- FOG	0.0	1.5	1.5	1.5
<b>Value of New Business</b>	<b>31.5</b>	<b>32.7</b>	<b>64.2</b>	<b>57.2</b>

The value of new business has decreased by EUR 20.5 million from EUR 84.7 million in 2005 to EUR 64.2 million in 2006 although Hannover Re maintained the high quality in writing new business. The decrease is explained largely by three effects:

The UK term assurance market has become increasingly competitive and Hannover Re has reduced capacity in this segment.

Resulting from a more detailed cost analysis for the Domestic Operations additional administration expenses for writing new business have been included in the VNB.

Hannover Life Re has written more financing business in 2006 in comparison to 2005 and this results in a higher "Profit/Loss on New Business during year" (EUR 107.4 million in 2005 and of EUR 121.1 million in 2006). On the other hand the amount of risk premium business was reduced due to the situation in the British market. In general the same volume of risk premium business has a much higher new business value than that of financing business.

## 4.2 New Business Margins

The following table displays the New Business Margins as a proportion of Annual Premium Equivalent (APE) and Present Value of New Business Premiums (PVNBP).

**Table 9: New Business Margins**

EUR million and percent	Before Minorities			After Minorities
	Domestic Operations	Foreign Operations	Total	Total
<b>VNB (Basic)</b>	31.5	32.7	64.2	57.2
New Business Premium in 2006 (NBP)	1,595.9	371.0	1,966.9	1,816.0
PVNBP	1,443.9	1,399.1	2,843.0	2,615.4
New Business Regular Premium (NBRP)	962.4	337.2	1,299.6	1,202.9
New Business Single Premium (NBSP)	633.5	33.8	667.3	613.0
New Business Margin (NBM) = VNB / (NBP + PVNBP)	1.0%	1.8%	1.3%	1.3%
Annual Premium Equivalent Margin = VNB / (NBRP+10% NBSP)	3.1%	9.6%	4.7%	4.5%

Hannover Re continues to maintain a policy of writing high quality business. The relatively low new business margins in 2006 are due to a high volume of financing business written and the model changes described in chapter 4.1.

Furthermore financing business also reduces the sensitivity of Hannover Re's EEV to changes in mortality experience as can be seen in Section 6.

## 5 Analysis of Change and Operating Embedded Value Earnings

The Analysis of Change of the EEV 2005 to the EEV 2006 consists of the following elements:

**Table 10: Analysis of Change (After Consolidation, Before Minorities)**

EUR million	SNW	PVFP	Total
<b>EEV(2005)</b>			<b>1,313.1</b>
Initial Adjustments			-7.1
<b>Restated EEV(2005)</b>	<b>418.3</b>	<b>887.6</b>	<b>1,305.9</b>
Operating Embedded Value Earnings	86.5	99.1	185.6
Economic Variances	8.2	0.1	8.3
Economic Assumption Changes	0.6	28.3	28.9
<b>Embedded Value Earnings</b>	<b>95.3</b>	<b>127.5</b>	<b>222.8</b>
Changes in Exchange Rate	-12.6	-28.0	-40.6
Capital Movements	33.3	0.0	33.3
Exceptional Items	-6.7	3.8	-3.0
<b>EEV(2006)</b>	<b>527.4</b>	<b>990.9</b>	<b>1,518.3</b>

**Initial Adjustments:**

The initial adjustments are mainly caused by the move to market consistent valuation methodology.

**Economic Assumption Changes:**

The economic assumption changes are essentially driven by the change in the swap yield curve.

**Changes in Exchange Rate:**

The EURO has strengthened during 2006 relative to most of the important currencies, with the exception of the British Pound. This influenced the EEV 2006 negatively by EUR 40.6 million.

**Capital Movements:**

This is the sum of two effects: a dividend payment by HLR Australasia and a capital injection into the life segment of Hannover Re. Further details are shown in Section 8.

**Table 11: Operating Embedded Value Earnings (After Cons., Before Minorities)**

EUR million	SNW	PVFP	Total
Expected Return on Shareholders' Net Worth	13.2	0.0	13.2
Release of Profit on Existing Business and Roll Forward	179.4	-131.5	48.0
Value of New Business (VNB)	-132.0	196.2	64.2
Experience Variances (actual vs exp.)	18.1	-7.8	10.4
Operating Assumption Changes	7.8	42.1	49.9
<b>Operating Embedded Value Earnings</b>	<b>86.5</b>	<b>99.1</b>	<b>185.6</b>

**Experience Variances:**

The actual premiums in 2006 under certain treaties written by the Hannover Life Re branches were lower than assumed. This leads to a negative experience variance of EUR 26.8 million.

HLR Ireland had favourable experience variance due to the recapture of a large treaty under favourable terms. Further HLR Ireland was able to realise unexpected earnings under a term assurance treaty. In total these effects amounted to a positive variance of EUR 38.8 million.

The total experience variance after allowing for other smaller effects is EUR 10.4 million.

**Operating Assumption Changes:**

The main effect arises from a change in the administration expense assumption for the Domestic Operations. This reflects actual experience and has a positive impact of EUR 44.7 million.

Together with other minor items Operating Assumption Changes total EUR 49.9 million.

The following table shows the EEV 2005, EEV 2006 and the Value of New Business after consolidation and minorities.

**Table 12: Corresponding Values (After Consolidation, After Minorities)**

EUR million	<b>Total</b>
EEV(2005)	1,117.2
Restated EEV(2005)	1,110.7
Value of New Business (VNB)	57.2
EEV(2006)	1,311.0

## 6 Sensitivities

### 6.1 Sensitivities of the European Embedded Value

The following table shows the sensitivity of the EEV to changes in specified economic and non-economic assumptions. The sensitivities are described in Section 9.

**Table 13: Sensitivities of the European Embedded Value**

EUR million	<b>Before Consol., Before Minorities</b>		
	<b>Domestic Operations</b>	<b>Foreign Operations</b>	<b>Total</b>
<b>EEV (Basic)</b>	1,277.3	812.2	2,089.5
<b>Sensitivities to Economic Assumptions</b>			
Discount Rate + 100 bps	1,252.1	791.3	2,043.4
Interest Rate environment - 100 bps	1,326.4	779.6	2,106.1
Equity/Property market values – 10%	1,277.3	811.1	2,088.4
Value Local Currency + 5%*	1,264.9	805.4	2,070.4
<b>Sensitivities to Non-Economic Assumptions</b>			
Expenses - 10%	1,284.3	822.2	2,106.5
Lapse - 10%	1,300.1	773.6	2,073.6
Mortality/Morbidity - 5%	1,360.6	956.1	2,316.7
Mort./Morb.–5%, Life/Disab. Bus. only	1,367.0	960.1	2,327.1
Mort./Morb.–5%, Annuity Bus. only	1,248.4	808.3	2,056.6

\* Treaties written in foreign currencies

It can be seen that all sensitivities have only a moderate impact and therefore meet our expectations.

The sensitivities for mortality and morbidity indicate that the business benefits from the diversification between financing and risk treaties. The impact of this sensitivity is especially low within the Domestic Operations due to a large proportion of financing business. This pictures the strong immunisation between classes of business.

Generally the average term for the run off of treaties has been reduced for the Domestic Operations which also reduces the impact on sensitivities.

## 6.2 Sensitivities of Value of New Business

As for the EEV, sensitivities have also been calculated for the Value of New Business.

**Table 14: Sensitivities of Value of New Business**

EUR million	Before Minorities		
	Domestic Operations	Foreign Operations	Total
<b>VNB (Basic)</b>	31.5	32.7	64.2
<b>Sensitivities to Economic Assumptions</b>			
Discount rate + 100 bps	27.3	29.5	56.9
Interest Rate environ. - 100 bps	37.2	24.0	61.2
Equity/Property market values – 10%	31.5	32.7	64.2
Value Local Currency + 5%*	29.4	32.2	61.6
<b>Sensitivities to Non-Economic Assumptions</b>			
Expenses - 10%	32.5	34.6	67.1
Lapse - 10%	32.1	27.4	59.5
Mortality/Morbidity - 5%	54.3	75.0	129.4
Mort./Morb.–5%, Life/Disab. Bus. only	54.3	76.3	130.7
Mort./Morb. – 5%, Annuity Bus. only	31.5	31.8	63.2

\*Treaties written in foreign currencies

## 7 Assumptions

### 7.1 Economic Assumptions

#### 7.1.1 Swap Rates

The risk free returns have been calibrated to the swap curves as shown below. A risk neutral approach has been applied and all asset classes are assumed to yield the risk free returns.

**Table 15: Swap Yield Curves as at 31 December 2006**

In %	EUR	USD	GBP	AUD	ZAR
<b>1 Year</b>	4.08	5.33	5.58	6.52	9.15
<b>2 Years</b>	4.12	5.17	5.50	6.52	8.91
<b>3 Years</b>	4.13	5.10	5.48	6.51	8.74
<b>4 Years</b>	4.13	5.09	5.44	6.54	8.62
<b>5 Years</b>	4.13	5.09	5.38	6.50	8.54
<b>6 Years</b>	4.13	5.11	5.33	6.47	8.48
<b>7 Years</b>	4.15	5.12	5.27	6.44	8.42
<b>8 Years</b>	4.16	5.14	5.22	6.41	8.36
<b>9 Years</b>	4.18	5.16	5.16	6.38	8.30
<b>10 Years</b>	4.20	5.18	5.11	6.39	8.24
<b>20 Years</b>	4.31	5.29	4.75	6.19	7.77
<b>30 Years</b>	4.29	5.31	4.51	6.03	7.45

The risk free returns in the following table were assumed for the original 2005 EEV calculations.

**Table 16: Risk Free Rates (RFRs) as at 31 December 2005**

<b>Currency</b>	<b>EUR</b>	<b>USD</b>	<b>GBP</b>	<b>AUD</b>	<b>ZAR</b>
<b>RFR in %</b>	3.31	4.40	4.10	5.22	7.47

For the restatement of the EEV 2005 the following swap rates were used.

**Table 17: Swap Yield Curves as at 31 December 2005**

<b>In %</b>	<b>EUR</b>	<b>USD</b>	<b>GBP</b>	<b>AUD</b>	<b>ZAR</b>
<b>1 Year</b>	2.85	4.84	4.57	5.63	7.04
<b>2 Years</b>	3.02	4.85	4.54	5.64	7.14
<b>3 Years</b>	3.12	4.84	4.57	5.65	7.26
<b>4 Years</b>	3.17	4.86	4.56	5.69	7.38
<b>5 Years</b>	3.21	4.88	4.54	5.70	7.45
<b>6 Years</b>	3.26	4.89	4.53	5.70	7.50
<b>7 Years</b>	3.31	4.89	4.52	5.70	7.54
<b>8 Years</b>	3.36	4.91	4.50	5.71	7.55
<b>9 Years</b>	3.40	4.92	4.48	5.71	7.52
<b>10 Years</b>	3.45	4.94	4.47	5.71	7.54
<b>20 Years</b>	3.73	5.06	4.32	5.67	7.28
<b>30 Years</b>	3.77	5.07	4.20	5.52	7.07

## 7.1.2 Volatilities

Hannover Life Re's portfolio only has significant FOGs in the US. The following volatilities in Table 18 have been applied. These monthly interest rate volatilities are not market consistent.

**Table 18: Volatilities**

<b>In %</b>	<b>31 December 2006</b>	<b>31 December 2005</b>
	<b>USD</b>	<b>USD</b>
<b>1 Year</b>	1.80	2.24
<b>2 Years</b>	1.77	2.26
<b>3 Years</b>	1.77	2.29
<b>4 Years</b>	1.78	2.31
<b>5 Years</b>	1.79	2.33
<b>6 Years</b>	1.80	2.35
<b>7 Years</b>	1.80	2.36
<b>8 Years</b>	1.80	2.36
<b>9 Years</b>	1.80	2.37
<b>10 Years</b>	1.81	2.37
<b>20 Years</b>	1.79	2.38
<b>30 Years</b>	1.79	2.38

The remaining business does not contain any material FOGs and the PVFPs are calculated on a certainty equivalent basis with no volatilities taken into account.

### 7.1.3 Currency Exchange Rates

**Table 19: Equivalent in EUR of 1 unit of the original currency**

	<b>USD</b>	<b>AUD</b>	<b>ZAR</b>	<b>GBP</b>
<b>2005</b>	0.84502	0.61939	0.13353	1.45560
<b>2006</b>	0.75867	0.59948	0.10852	1.48943

### 7.1.4 Credit Risk on Assets

The credit risk on assets is reflected in the initial market value of the assets. All assets are then assumed to earn risk free returns.

### 7.1.5 Counterparty Risk

Counterparty Risks under the reinsurance treaties are reflected within the Cost of Non-Financial Risks. These risks mainly reflect the possible loss of unamortized initial financing should the ceding company become insolvent.

### 7.1.6 Tax

The currently applicable tax rates are:

**Table 20: Tax Rates in %**

<b>Germany</b> 40.15	<b>UK</b> 30.0	<b>US</b> 35.0	<b>Ireland</b> 12.5	<b>Australia</b> 30.0
<b>South Africa</b> 29.0	<b>France</b> 34.0	<b>Sweden</b> 28.0	<b>Hong Kong</b> 11.24	<b>Malaysia</b> 7.96

The projections allow for tax losses carried forward.

## 7.2. Non-Economic Assumptions

### 7.2.1 Cost of Non-Financial Risks

The Risk Discount Rate (RDR) depends on the risk category of each treaty and is determined as the risk free rate (a vector) plus a constant risk margin. The risk margins are derived using a bottom-up approach for groups of treaties with similar characteristics reflecting the inherent non-financial risks.

The non-financial risks reflected in the risk margin are:

- Operational Risk
- Counterparty Risk
- Mortality Risk
- Morbidity Risk
- Longevity Risk
- Lapse Risk

The covered business is categorised according to low risk, medium risk and high risk classes as described in the section "Methodology".

A risk margin of 3.5% and a beta of 1.0 has been assumed for Hannover Re.

The majority of treaties have been defined as medium risk. All the non medium risk treaties classes are described below and their corresponding risk margins have been set on the basis of bottom up considerations.

#### Domestic Operations:

Mainly unit-linked contracts are reinsured under the European coinsurance treaties with deficit accounts. The risk margin for these treaties varies by underwriting year depending on factors such as the expected term to amortize the deficit account or the sensitivity of the expected amortization period to changes in lapse assumptions. For the total class described the weighted average reduction of the medium risk spread is 1.77%. Last year the weighted average reduction of the medium risk RDR has been 0.83%. The change is due to the above mentioned reduction in the average term of reinsurance treaties and a concurrent reduction in risk.

#### Foreign Operations:

- A portion of the UK term assurances written by HLR Ireland was classified as “high risk” and the risk margin has been derived at 4.75%.
- Australian DII business was classified as high risk business. Its PVFP was calculated with a risk margin of 5.5%.
- One Australian coinsurance treaty was classified as low risk. The spread was determined to be 1.5%.
- A South African coinsurance treaty was classified as low risk. The spread was determined to be 2.0%.

### **7.2.2 Mortality Improvements**

Mortality improvements under products covering death benefits have been assumed within the foreign operations mainly for certain reinsurance treaties covering UK term assurances.

### **7.3 Expenses**

The total actual administration expenses for the year 2006 have been taken into account in deriving the expense assumptions. The expenses have been allocated to the treaties and projected into the future allowing for expense inflation.

## 8 Reconciliation of IFRS Equity to EEV / Embedded Value not Recognized

Life & Health reinsurance business is actively written by Hannover Re, E+S Re and the life reinsurance subsidiaries of Hannover Re. The consolidated EEV is derived from the business written by these companies. In the past, Life business has in exceptional circumstances also been written by companies outside of these Life & Health business centres. Accordingly it is necessary for the reconciliation of the IFRS equity to EEV to take into account only those companies which are consolidated for the EEV.

The IFRS equity not included in the consolidated EEV is defined as “**IFRS equity outside**”.

$$\text{IFRS equity Hannover Life Re} = (\text{IFRS equity Life and Health segment})^* - (\text{IFRS equity outside})$$

\* IFRS equity as taken from the segmental balance sheet

The respective values applicable are in EUR million:

IFRS equity:	707.2 (2005);	846.8 (2006)
IFRS equity outside	162.5 (2005 rest.);	250.3 (2006)

There has been a change in the value of the IFRS equity outside from 2005 to 2006 of EUR 87.7 million following a transfer of this amount under existing business at the end of 2006.

Table 21 also shows that the 2005 IFRS equity outside has been restated by an amount of EUR 7.7 million. This represents the IFRS equity of a few small entities that do not write covered business and were summarized under Consolidation Adjustments in 2005.

Hannover Life Re has specialised in writing, and continues to write, reinsurance financing business. In the past the acquisition of large volumes of financing business was only possible due to the financial support provided by the P&C Segment of Hannover Re. Within the segmental reporting this historic financing is shown as an intersegmental liability from the Life Segment to the P&C Segment (“**Bridge Financing**”). The impact of Bridge Financing on the Hannover Re Group balance sheet is neutral as the liability for the Life Segment and the asset for the P&C Segment cancel each other out. The Bridge Financing amounted to EUR 620.9 million (2005) and EUR 678.0 million (2006). The increase is mainly due to the additional financing activities of the Life & Health business centres in 2006.

Table 21 now shows the **Surplus Notes**, that have been provided by Hannover Re to its subsidiaries, separately. In 2005 these Surplus Notes were included in the Consolidation Adjustments.

The following table shows the reconciliation of the IFRS equity for the Life & Health segment to the EEV.

**Table 21: Reconciliation 2005 / 2006 (After Consolidation)**

EUR million	31 Dec 2005	31 Dec 2005 restated	31 Dec 2006
<b>IFRS Equity</b>	<b>707.2</b>	<b>707.2</b>	<b>846.8</b>
IFRS equity outside	-154.8	-162.5	-250.3
Intra Company Surplus Notes		-59.6	-47.1
Bridge Financing	620.9	620.9	678.0
<b>Adjusted IFRS Equity</b>	<b>1,173.3</b>	<b>1,106.0</b>	<b>1,227.4</b>
Valuation Differences	-645.4	-645.4	-672.1
PVFP (After Tax, CoC, FOGs, PD)	856.7	847.7	942.6
Consolidation Adjustments	-71.5	-2.4	20.4
<b>EEV</b>	<b>1,313.1</b>	<b>1,305.9</b>	<b>1,518.3</b>

Part of the EEV of the covered business is already included in the IFRS Equity. On the basis of the above table it is possible to determine the difference between EEV and Adjusted IFRS equity (the “**Embedded Value not Recognized (EVNR)**”):

In EUR million

$$\text{EVNR (2005 rest.)} = 1,305.9 - 1,106.0 = \mathbf{199.9}$$

$$\text{EVNR (2006)} = 1,518.3 - 1,227.4 = \mathbf{290.9}$$

The values are after consolidation and before minorities.

## 9 EEV Methodology

The EEV calculations are performed on a market consistent basis. Investment returns for all asset classes are assumed to be equal to the risk free interest rates and explicit allowance is made to cover the CoNFR.

The majority of treaties either do not have significant FOGs or the assets and liabilities are well matched. The results for these treaties have been calculated using deterministic projections.

The European Embedded Value (EEV) is defined as:

$$\begin{aligned} \text{EEV} &= \text{FS} + (\text{RC} - \text{CoC}(\text{RC})) + \text{PVFP} \\ &= \text{FS} + (\text{RC} - \text{CoC}(\text{RC})) + \text{PVFP}(\text{CE}) - \text{CoNFR} - \text{FOGs} \end{aligned}$$

- The Free Surplus (FS) is the market value of any capital and surplus allocated to, but not required to support the in force covered business at the valuation date.
- Required Capital (RC) is the Minimum Solvency Capital.
- The cost of holding Required Capital (CoC(RC)) represents the cost of double taxation, calculated as the tax payable on the investment return on the Required Capital. The investment return is derived on a risk free basis (forward rates).
- PVFP(CE) is the present value of projected statutory shareholders' profits from the covered business in force calculated on a certainty equivalent basis. The risk discount rates RDR(CE) are the spot rates derived from the risk free swap curves.
- The Costs of Non-Financial Risks are derived from the formula:  

$$\text{CoNFR} = \text{PVFP}(\text{CE}) - \text{PVFP}.$$

PVFP is calculated with a spread, i.e. with a RDR of RDR(CE) plus risk margin.

The covered business has been categorised according to low, medium and high risk. The risk margin for all mainstream business (medium risks) equals to 3.5%. For low and high risk business the risk margin is determined using sensitivities.

Low risks: The base PVFP does not fall by more than 25% for all the following sensitivities:

mortality/morbidity + 100%, lapse + 100%, lapse -90%, investment yield -2%.

High risks: The base PVFP falls by more than 25% for at least one of the sensitivities: mortality/morbidity + 5%, lapse + 10%, lapse -10%, investment yield -1%.

The sensitivity calculations for the low and high risk treaties are always performed separately.

The **Net Asset Value** (NAV = FS + RC) is derived from the consolidation of the Net Asset Values of the following companies:

**Domestic Operations:**

Hannover Rück AG (Hannover Re) – Life Division  
 E+S Rück AG (E+S Re) – Life Division

**Foreign Operations:**

HLR Africa, Johannesburg	HLR Ireland, Dublin
HLR America, Orlando FL	HLR UK, Virginia Water/London
HLR Australasia, Sydney	

Hannover Re holds 100% of the shares of all companies except E+S Re (55.78%) and HLR Australasia (50%). E+S Re holds 50% of the shares of HLR Australasia.

Hannover Re and E+S Re are both composite reinsurance companies writing life and non-life reinsurance business. The Net Asset Value of the Life Division has been derived by making adjustments to the IFRS (Life-) Equity.

The Net Asset Value after CoC (Free Surplus + RC – CoC) is defined as the **Shareholders' Net Worth** (SNW).

For the roll forward of the free surplus, the required capital less CoC, last year's PVFP and last year's CoNFR prior year's (pre tax) one year forward rates apply.

**General Assumptions:**

- The group companies are under going concern, i.e. they remain in operation and continue writing new business.
- The EEV is calculated using best estimate assumptions.
- All values are post-tax.
- Expense inflation was recognized for the EEV calculations. For part of the business at the same time there is increased efficiency taken into account, which to some extent compensates expense inflation.
- Overhead expenses are included within the administrative expenses.
- No future new business is included in the calculations.
- No productivity gains are considered, except for those compensating the expense inflation.

**Financial Options and Guarantees (FOGs):**

Stochastic models have been used to estimate the FOGs for the US business with guarantees.

The Time Value of the FOGs (TVFOGs) is derived from:

$$\text{TVFOGs} = \text{PVFP(CE)} \\ \text{less Mean Stochastic PVFP (taking the mean of PVFPs derived from a} \\ \text{large number of stochastic scenarios).}$$

**New Business:**

New business is defined as new reinsurance treaties written or new policies written under existing treaties during the year.

It is assumed that the point of sale for new policies was at year-end, i.e. the profit and loss on new business during the year was also effective December 31.

**Value of New Business (VNB):**

The Value of New Business is defined as:

$$\text{VNB} = \text{P/L(NB)} + \text{PVNB} - \text{CoC(NB)} - \text{CoNFR(NB)} - \text{FOG(NB)}$$

The abbreviations stand for:

P/L(NB) = Profit and Loss on New Business for the year;

PVNB = Present Value at year-end of Future Profits on New Business written in current year;

CoC(NB) = Cost of Capital on New Business;

CoNFR(NB) = Cost of Non-Financial Risk on New Business,

FOG(NB) = Value of FOGs on New Business.

**New Business Margins:**

1) The new business margin is defined as:

$$\text{NBM} = \text{VNB} / (\text{NBP} + \text{PVNBP})$$

The abbreviations stand for:

NBM = New Business Margin,

NBP = New Business Premium current year,

PVNBP = Present Value of New Business premium at year-end.

2) The Annual Premium Equivalent Margin (APEM) is defined as:

$$\text{APEM} = \text{VNB} / (\text{Annual New Business Premium} + 10\% \text{ New Business Single Premium}).$$

**Sensitivities:****Discount Rate + 100 bps**

In this sensitivity the discount rate is changed in isolation from all other assumptions.

**Interest environment – 100 bps**

Under this sensitivity a parallel shift in the risk free yield curve is assumed. As a consequence current market values of fixed interest assets are increased and future reinvestment rates are reduced. This sensitivity is not performed in isolation, but there are associated impacts on most other economic assumptions.

**Equity/Property market values – 10%**

This sensitivity indicates a certain change in the market values of these assets.

**Value Local Currency + 5%\*\***

The sensitivity reflects a change in the value of the local currency.

**Expenses - 10%**

This sensitivity applies to the projected level of expenses without a change in the expense inflation.

**Lapse - 10%**

Hereunder 10% proportional decrease in lapse rates has been executed i.e. which is a multiplicative change in lapse rates.

**Mortality/Morbidity - 5%**

The sensitivity has been performed for three different situations:

- Mortality and Morbidity are proportionately reduced for all classes of business at the same time.
- The sensitivity is performed only for life, disability, medical insurances and related products.
- Mortality is changed only for the annuity policies.

## **Appendix**

### **Disclaimer**

The information provided in this report does in no way whatsoever constitute legal, accounting, tax, or other professional advice.

While Hannover Re has endeavoured to include in this report information it believes to be reliable, complete and up-to-date, the company does not make any representation or warranty, express or implied, as to the accuracy, completeness or updated status of such information.

Some of the information in this report may be forward-looking information or information on future expectations based on currently available information. Such information naturally is subject to risks and uncertainties. Factors such as the development of general economic conditions, future market conditions, unusual catastrophic loss events, changes in the capital markets and other circumstances may cause the actual events or results to be materially different from those anticipated by such information. Hannover Re assumes no obligation to update any forward-looking information contained in this report.

It should be noted that all calculations are based on data reported by the ceding companies of Hannover Re and its subsidiaries, which are mainly bulk data, which do not allow to specify exactly the portfolio composition.

Therefore, in no case whatsoever will Hannover Re and its affiliate companies be liable to anyone for any decision made or action taken in conjunction with the information in this report or for any related damages.

The Directors  
Hannover Rückversicherung AG  
Karl-Wiechert-Allee 50  
30625 Hannover

26 April 2007

Dear Sirs

**Review of the European Embedded Value of the Life & Health segment of Hannover Rückversicherung AG as at 31st December 2006**

The Life and Health Reinsurance Business of Hannover Rückversicherung AG, as reported under the "life reinsurance" segment in the primary financial statements, is written by Hannover Rückversicherung AG and E+S Rückversicherung AG, together with their subsidiaries, branches and offices (together "Hannover Life Re" or "HLR").

Hannover Rückversicherung AG has determined the European Embedded Value results of HLR for 2006 as set out in the Statements of European Embedded Value (together "the Statements") on a basis consistent with the requirements of the European Embedded Value Principles published by the CFO Forum (the "EEV Principles"). These Statements, the methodologies applied and the assumptions underlying them are each the sole responsibility of the Board of Directors of Hannover Rückversicherung AG.

The Statements have been prepared by HLR as the aggregate of separate European Embedded Values determined for each significant operating unit making due allowance for inter group transactions including retrocessions, any minority interests together with the elimination of the book values of the businesses for which an European Embedded Value has been calculated.

The calculation of embedded values necessarily makes numerous assumptions with respect to economic conditions, operating conditions, taxes, and other matters, many of which are beyond Hannover Rückversicherung AG's control. Although the assumptions used represent estimates which the Directors believe are together reasonable, actual experience in future may vary from that assumed in the calculation of European Embedded Values and such variation may be material. Deviations from assumed experience are normal and are to be expected.

The resulting European Embedded Value does not purport to be a market valuation of HLR and should not be interpreted in that manner since it does not purport to encompass all of the many factors that may bear upon a market value.

## Scope of B&W Deloitte's Review

We have reviewed the methodology adopted, the assumptions used and calculations made by the Directors to determine the European Embedded Values for the businesses concerned and their aggregation into the consolidated European Embedded Value of HLR.

Our work was conducted in accordance with generally accepted actuarial practices and processes. It comprised a combination of such reasonableness checks, analytical review and checks of clerical accuracy as we considered necessary to provide reasonable assurance that the Statements have been compiled free of significant error. However, we have relied upon the completeness and accuracy of the data and information supplied by HLR, including the book value of the net assets of HLR as disclosed in Hannover Rückversicherung AG's financial statements on which the Statements are based. Accordingly, as is customary, we have not audited, verified or otherwise substantiated that data and information.

## Opinion

In our opinion, HLR's methodology as approved by the Directors of Hannover Rückversicherung AG is appropriate, its assumptions taken together are reasonable and the estimate of its consolidated European Embedded Value has been properly compiled consistent with the "EEV Principles".

This report is made solely to Hannover Rückversicherung AG's Directors as a body. To the fullest extent permitted by law we do not accept or assume responsibility to anyone other than Hannover Rückversicherung AG's Directors as a body for our work in respect of this report or for the conclusions that we have reached.

Yours faithfully



Bharat Bhayani  
B&W Deloitte GmbH