somewhat different

MCEV Report 2012

hannover re®

Contents

Introduction

Hannover Rückversicherung AG's (Hannover Re) 2012 Market Consistent Embedded Value (MCEV) disclosure generally complies with the European Insurance CFO Forum Market Consistent Embedded Value Principles© (MCEV Principles) published in June 2008. The only exception is the non-disclosure of the Group Market Consistent Embedded Value.

The CFO Forum published a revised version of the MCEV Principles in October 2009 which allow for the inclusion of a liquidity premium in addition to the reference rates. However, the discussion regarding the products to which a liquidity premium should be applied is still ongoing. Hannover Re has therefore decided not to include a liquidity premium in the calculation of the base results. A sensitivity showing the impact of a liquidity premium of 10bps on our business has been analysed.

This report refers to the valuation date 31 December 2012.

Hannover Re's embedded value report is presented net of non-controlling interests ("after minorities") unless otherwise stated. All amounts in the result tables are shown in EUR million rounded to one decimal place. Small differences may therefore arise between the totals and the sum of the individual amounts.The directors of Hannover Re acknowledge their responsibility for the preparation of the supplementary information in accordance with the Market Consistent Embedded Value Principles.

B&W Deloitte GmbH, actuaries and consultants, has been retained to review the Market Consistent Embedded Value results. The scope and conclusions of this review are shown at the end of this document.

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

1. Covered Business

The business covered includes the business reported in the life and health segment of Hannover Re's published financial statements.

All worldwide reinsurance activities of Hannover Re in the life, annuity and health (including personal accident) insurance lines are combined under the name "Hannover Re Life and Health" (Hannover Re L&H).

This disclosure document generally shows total results as well as a breakdown for the Domestic and Foreign Operations.

The Domestic Operations include the business written directly by Hannover Re and E+S Rückversicherung AG (E+S Rück) in Hannover and also the business written by the branches. Business retroceded by the Foreign Operations to Hannover Re is also included under Domestic Operations. The life and health business written by the subsidiary Hannover ReTakaful in Bahrain has been included under Domestic Operations because this subsidiary reports directly to the Domestic Operations. Details of the Domestic Operations are shown in Appendix IV "Overview of Domestic Operations".

The Foreign Operations include the life and health reassurance subsidiaries of Hannover Re in South Africa, the United States, Australia, Bermuda and the UK. Hannover Re's Irish life and health and non-life subsidiaries merged in 2012. The life and health business segment of the Irish subsidiary is also included under Foreign Operations. Details are shown in Appendix V "Overview of Foreign Operations".

Hannover Re L&H writes the following lines of business:

Individual life and group life, unit linked as well as conventional business, annuities (standard, impaired and enhanced), disability income, critical illness, long-term care, medical supplement, medicare, and special (personal accident) risks.

All values shown in the disclosure are net of intra-group retrocessions and external retrocessions. In the case of intra-group retrocessions, this means that the retroceded business is excluded from the retroceding company's results and included in the results of the retrocessionaire. The values shown are post-tax.

The consolidated results allow for the elimination of the book values for all six subsidiaries of Hannover Re for which a Market Consistent Embedded Value has been determined.

All formulae, abbreviations and notations are provided in Appendix III "Formulae and Abbreviations".

2. Market Consistent Embedded Value 2012 and its Components

2.1 Performance 2012

The following table shows the key figures for the Market Consistent Embedded Value (MCEV) 2012 and 2011.

Table 1: Performance Market Consistent Embedded Value (MCEV)

in EUR million	2012				2011
	Before consolidation			After consolidation [1]	After consolidation [1]
	Domestic Operations	Foreign Operations	Total	Total	Total
Market Consistent Embedded Value (MCEV)	1,989.6	2,323.5	4,313.1	3,133.9	3,065.8
Return on Market Consistent Embedded Value (MCEV) [2]			8.2%	9.6%	16.2%
Value of New Business (VNB)	84.7	228.9	313.6	313.6	240.6
New Business Margin (NBM)	2.8%	10.0%	5.9%	5.9%	3.4%

[1] The book values of the subsidiaries that have determined MCEV results have been eliminated.
[2] Excluding opening and closing adjustments

The main drivers for the high return on the MCEV 2012 are:

- Excellent Value of New Business
- Positive Experience Variances on Investment Yield
- Expected existing business contribution (planned roll forward of the MCEV from the previous year to the current year)

Please refer to sections 3 "New Business" and 4 "Analysis of Earnings" for details on the drivers behind the excellent Value of New Business and high return on MCEV.

2.2 Comparison: Market Consistent Embedded Value 2011 and 2012

Table 2 shows the components of the MCEV as well as the MCEV before and after consolidation adjustments.

Table 2: Market Consistent Embedded Value (MCEV) 2012 and 2011

in EUR million	2012			2011		
	Domestic Operations	Foreign Operations	Total	Domestic Operations	Foreign Operations	Total
Free Surplus (FS)	377.8	215.7	593.5	512.9	374.4	887.3
Required Capital (RC)[1]	633.4	955.0	1,588.4	537.6	878.6	1,416.2
Shareholder Net Worth (SNW)	**1,011.2**	**1,170.6**	**2,181.9**	**1,050.5**	**1,253.0**	**2,303.5**
Present Value of Future Profits (PVFP)	1,109.5	1,568.1	2,677.6	1,108.5	1,360.9	2,469.3
Cost of Residual Non- Hedgeable Risks (CoRNHR)	(101.3)	(326.7)	(427.9)	(124.6)	(290.3)	(414.9)
Frictional Costs of Required Capital (FCoRC)	(19.7)	(83.0)	(102.7)	(20.6)	(78.8)	(99.4)
Financial Options and Guarantees (FOGs)	(10.2)	(5.6)	(15.8)	(7.3)	(6.4)	(13.7)
Value In-Force (VIF)	**978.4**	**1,152.8**	**2,131.2**	**956.0**	**985.3**	**1,941.3**
Market Consistent Embedded Value (MCEV) before consolidation	**1,989.6**	**2,323.5**	**4,313.1**	**2,006.5**	**2,238.4**	**4,244.9**
Consolidation[2]			(1,179.1)			(1,179.1)
Market Consistent Embedded Value (MCEV) after consolidation			3,133.9			3,065.8

1 Sum of local Required Capital (RC) before allowing for diversification between the entities of Hannover Re Life and Health

2 Book values of the subsidiaries that have determined MCEV results

2.3 Value In-Force – 2012 Breakdown

Hannover Re Life and Health's (Hannover Re L&H) reporting structures were adjusted and refined to focus more closely on Hannover Re L&H's growth markets. The business of Hannover Re L&H is now divided into Financial Solutions and Risk Solutions; the latter is further subdivided into Mortality, Longevity and Morbidity.

Financial Solutions covers all treaties in which the primary emphasis is on financing or capital management components. Reinsurance treaties focused first and foremost on transfer of the mortality risk are allocated to the Mortality category. Allocation to the Longevity and Morbidity categories is similarly determined by the underlying risks. In this context, Morbidity encompasses not only health business but also other risks such as disability and critical illness. This means that the reporting structure now puts the focus on the individual risk types (please also refer to our annual report published on 7 March 2013). The breakdown of the Value In-Force (VIF) by type of risk covered is shown in Table 3.

Since Financial Solutions is not further split into the different risk types, the figures shown in Table 3 are not comparable to the figures shown for life, annuity, health and personal accident in 2011.

For Foreign Operations the amount reported under Financial Solutions increased in comparison to 2011. This increase is mainly caused by new treaties in the US market.

For Domestic Operations the differences in comparison to 2011 for Financial Solutions and Risk Solutions are caused by new business treaties, assumption changes as well as changes due to the new reporting structure.

Table 3: Value In-Force (VIF) by type of risk covered

in EUR million	Domestic Operations	Foreign Operations	Total
Risk Solutions – Mortality	419.9	746.3	1,166.1
Risk Solutions – Longevity	49.7	10.6	60.3
Risk Solutions – Morbidity	21.2	81.2	102.4
Financial Solutions	487.7	314.7	802.4
Total	**978.4**	**1,152.8**	**2,131.2**

2.4 Financial Options and Guarantees, Look Through and Pension Deficits

2.4.1 Financial Options and Guarantees

Most of the time value of Financial Options and Guarantees (FOGs) in Hannover Re Life and Health's portfolio originates from the US market and is mainly due to guarantees under interest-sensitive products. The value of FOGs shown for the Domestic Operations stems from the internal retrocessions from the US subsidiary and one retrocession treaty from the South African subsidiary. The other treaties with interest guarantees either have assets matching the liabilities or are not material.

A summary of the FOGs is shown in Table 4.

Table 4: Time Value of Financial Options and Guarantees (FOGs)

in EUR million	2012	2011
Domestic Operations	10.2	7.3
Foreign Operations	5.6	6.4
Total	**15.8**	**13.7**
in % of Market Consistent Embedded Value (MCEV)	0.5%	0.4%

2.4.2 Participating Business

Hannover Re L&H has a few reassurance treaties where the returns to the reinsurer are dependent on the policyholder profit participation in the underlying products. The gross written premium and the contribution to the VIF from these treaties are not material. The profit participation elements have therefore not been modelled explicitly.

2.4.3 Look Through

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

2.4.4 Pension Deficits

Pension liabilities for the majority of the pension obligations are based on a defined contribution scheme or reinsured outside of the group. As a result of this Hannover Re L&H has no Pension Deficits.

3. New Business

3.1 Value of New Business

The Value of New Business (VNB) for the year 2012 is shown in Table 5.

The new business contribution in 2012 for the Domestic Operations is largely driven by individual and group life as well as morbidity business written by the branches in Asia and France. The significant increase in the VNB for Foreign Operations is mainly caused by innovative structured Yearly Renewable Term (YRT) transactions and Mortality Solutions business underwritten by the US, Bermudian and Irish subsidiaries.

Table 5: Value of New Business (VNB)

in EUR million	Domestic Operations	Foreign Operations	Total
Profit/Loss on New Business during year (P/L)	(74.3)	(53.4)	(127.7)
Present Value of New Business Profits (PVNB)	173.0	316.8	489.8
Cost of Residual Non-Hedgeable Risks (CoRNHR)	(12.3)	(25.3)	(37.5)
Frictional Costs of Required Capital (FCoRC)	(1.8)	(9.2)	(11.0)
Financial Options and Guarantees (FOGs)	0.0	0.0	0.0
Value of New Business (VNB)	**84.7**	**228.9**	**313.6**

3.2 New Business Margins

The New Business Margin (NBM) and the Annual Premium Equivalent Margin (APEM) are defined as the VNB in percent of the new business premiums (New Business Premium in 2012 (NBP) plus Present Value of New Business Premiums (PVNBP)) and in percent of the Annual Premium Equivalent (APE), respectively. Table 6 shows the New Business Margins separately for the Domestic and Foreign Operations.

The NBM increase for the Domestic Operations stems from very profitable deals written by our branches.

The significant increase in the New Business Margins for the Foreign Operations is driven by the subsidiaries in Ireland, Bermuda and in the US. A significant amount of the new business for the Foreign Operations arises from treaties where the premiums in the calculation of the margins are set equal to the fees.

Table 6: New Business Margins

in EUR million	Domestic Operations	Foreign Operations	Total
Value of New Business (VNB)	84.7	228.9	313.6
New Business Premium in 2012 (NBP)	1,392.8	286.0	1,678.8
Present Value of New Business Premiums (PVNBP)	1,669.0	1,996.1	3,665.1
New Business Regular Premium (NBRP)	370.7	235.9	606.6
New Business Single Premium (NBSP)	1,022.1	50.1	1,072.1
New Business Margin (NBM)[1]	**2.8%**	**10.0%**	**5.9%**
Annual Premium Equivalent Margin (APEM)[1]	**17.9%**	**95.0%**	**43.9%**

[1] The statutory accounting principles in Bermuda and Ireland are similar to IFRS, i.e. deposit accounting treaties and similar arrangements are shown with zero premium in the local financial statements. The premiums shown above also include the fees under these treaties.

4. Analysis of Earnings

The following table shows the key drivers for the change in the Market Consistent Embedded Value (MCEV) from the beginning to the end of the reporting year.

Table 7: Analysis of Market Consistent Embedded Value (MCEV) Earnings

	Before consolidation				After consolidation
in EUR million	Free Surplus	Required Capital	Value In-Force	Market Consistent Embedded Value	Market Consistent Embedded Value
Opening Market Consistent Embedded Value (MCEV)	**887.3**	**1,416.2**	**1,941.3**	**4,244.9**	**3,065.8**
Opening adjustments	(12.1)	(4.2)	(1.0)	(17.3)	(7.3)
Dividend payments	(10.0)	0.0	0.0	(10.0)	0.0
Change in currency exchange rates	(2.1)	(4.2)	(1.0)	(7.3)	(7.3)
Other implications	0.0	0.0	0.0	0.0	0.0
Adjusted opening Market Consistent Embedded Value (MCEV)	**875.2**	**1,412.0**	**1,940.4**	**4,227.6**	**3,058.4**
Value of New Business (VNB)	(446.4)	318.7	441.3	313.6	313.6
Expected existing business contribution (reference rate)	10.4	18.9	75.4	104.7	93.4
Expected existing business contribution (in excess of reference rate)	16.0	25.2	0.0	41.2	19.1
Transfers from Value In-Force (VIF) and Required Capital (RC) to Free Surplus (FS)	354.7	(167.6)	(187.0)	0.0	0.0
Experience variances	(128.7)	(2.0)	(39.7)	(170.4)	(170.4)
Assumption changes	(184.5)	(1.4)	(101.0)	(286.9)	(286.9)
Other operating variance	7.9	(4.9)	(28.7)	(25.7)	(25.7)
Model changes	7.9	(4.9)	(22.6)	(19.6)	(19.6)
Other operating variance	0.0	0.0	(6.1)	(6.1)	(6.1)
Operating MCEV earnings	**(370.6)**	**186.9**	**160.3**	**(23.4)**	**(56.9)**
Economic variances	340.2	1.2	20.2	361.7	339.2
Other non-operating variance	11.8	(11.8)	10.3	10.3	10.3
Total MCEV earnings	**(18.7)**	**176.4**	**190.8**	**348.5**	**292.5**
Closing adjustments	**(263.0)**	**0.0**	**0.0**	**(263.0)**	**(217.1)**
Capital injection	(153.1)	0.0	0.0	(153.1)	(153.1)
Dividend payments	(109.9)	0.0	0.0	(109.9)	(64.0)
Closing Market Consistent Embedded Value (MCEV)	**593.5**	**1,588.4**	**2,131.2**	**4,313.1**	**3,133.9**

4.1 Opening Adjustments

Dividend payments

The subsidiary in Bermuda paid dividends to Hannover Re. This effect is removed in the consolidation.

Change in currency exchange rates

The major currencies moved in different directions, yielding a nearly neutral result.

4.2 Expected Existing Business Contribution

At the reference rate

This includes the unwinding for one year of the discount rates (i.e. the reference rates) in respect of the Value In-Force (VIF) and a release from risk for the Cost of Residual Non Hedgeable Risks (CoRNHR) and the Frictional Costs of Required Capital (FCoRC). The expected contribution on the Free Surplus (FS) and the Required Capital (RC) is equal to the reference rates less tax.

In excess of the reference rate

This reflects the management's best estimate of the expected investment returns in the year to the valuation date.

4.3 Experience Variances

The negative change in the Shareholder Net Worth (SNW) is primarily due to adverse deviation in the claims experience for mortality risk treaties in the US market. One of the main drivers behind the adverse experience was an increase in the observed suicide-related claims.

The negative effect on the VIF mainly originates from an increase in the economic capital and the associated higher CoRNHR.

4.4 Assumption Changes

The negative impact on the SNW due to assumption changes mainly arises from an increase in the additional reserve for certain risk treaties in the US market. It is assumed that this conservative statutory reserve will not be used and therefore has a corresponding positive impact on the VIF. In total the effect on the MCEV is nearly neutral.

The negative change in the VIF is primarily due to the adoption of new mortality assumptions, including mortality improvement assumptions, for the mortality risk treaties in the US market and for the annuity treaties in the UK market. The new assumptions are based on extensive experience analyses which were carried out for these treaties.

4.5 Other Operating Variance

Change of model

The negative effect on the VIF can be explained by an adjustment of the dynamic management interactions under certain treaties in the US market.

Other operating variance

The sum of minor unexplained effects is shown under this position.

4.6 Economic Variances

The main driver for the positive economic variances of the FS is higher than expected investment returns for the current year. These returns refer not only to the investment returns earned on the SNW, but also to the returns earned on the assets backing liabilities. Furthermore, the decrease in the yield curves has led to an increase in the market value of the SNW.

The positive economic variances of the VIF result from the continued slight reduction in interest rates. For Domestic Operations the assets backing most of the liabilities are deposited back with the ceding companies where a fixed interested rate is guaranteed by the ceding company. The lower yield curves therefore only impact the discounting (and not the future investment return) and thereby lead to a higher Present Value of Future Profits (PVFP). Some of the Foreign Operations are adversely impacted by the reduction in interest rates due to lower future investment returns, which exceed the positive impact of lower discount rates. In total, Domestic and Foreign Operations show a positive effect.

4.7 Other Non Operating Variance

Changes to the RC requirements in Bermuda and the UK led to an overall decrease in the RC and a corresponding increase in the FS. Reductions in the tax rates in the UK, Sweden and Korea led to an increase in the VIF.

4.8 Closing Adjustments

Capital injection

The capital injection includes the decrease in the intra-company bridge financing (for details see section 6 "Reconciliation of IFRS Equity to Market Consistent Embedded Value/Embedded Value not Recognised") as well as a net decrease in surplus notes and subordinated loans included in the MCEV of the US and UK subsidiaries.

Dividend payments

The dividend payments show the portion of the dividends paid by Hannover Re which was allocated to Hannover Re Life and Health.

In addition, dividends have been paid by the Irish subsidiary to Hannover Re. This effect is removed in the consolidation.

5. Sensitivities

5.1 Sensitivities of Market Consistent Embedded Value

The following table shows the sensitivity of the Market Consistent Embedded Value (MCEV) to changes in specified economic and non-economic assumptions. The sensitivities are described in the Appendix "Sensitivities". Table 8 shows the absolute deviation from the base value.

Only non-symmetric sensitivities are shown in both directions.

The increased sensitivity to interest rates is driven by improved modelling of the book-to-market value adjustments for US business, which now explicitly allows for changes in the book-to-market value adjustments under the interest rate sensitivity calculations.

The asymmetry of the interest rate sensitivities under Foreign Operations can be explained by dynamic management interactions under special treaties in the US market. In particular, a contractually agreed limitation of the allowed premium increase in case of poor capital market developments has been implemented.

The base run does not include any liquidity premium. Therefore, the sensitivity "Liquidity premium +10bps" implies a 10 bps liquidity premium applied to all treaties where a liquidity premium could be earned.

The asymmetry of the lapse sensitivities is caused by conservative modelling of certain mortality treaties in the US market.

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 lower within the Domestic Operations due to a larger proportion of financing business.

Table 8: Sensitivities of the Market Consistent Embedded Value (MCEV)

in EUR million	Domestic Operations	Foreign Operations	Total	After consolidation Total
Basic Market Consistent Embedded Value (MCEV)	**1,989.6**	**2,323.5**	**4,313.1**	**3,133.9**
Sensitivities to economic assumptions				
Interest rate environment +100 bps	(77.7)	(156.7)	(234.4)	(234.4)
Interest rate environment -100 bps	75.0	213.3	288.3	288.3
Equity/property market value -10%	(1.1)	(0.5)	(1.6)	(1.6)
Swaption implied volatilities +25%	(6.0)	(4.3)	(10.2)	(10.2)
Liquidity premium +10bps	1.7	65.2	66.9	66.9
Sensitivities to non-economic assumptions				
Expenses -10%	16.7	64.2	80.9	80.9
Lapse +10%	(55.2)	(321.7)	(376.9)	(376.9)
Lapse -10%	60.1	192.1	252.2	252.2
Mortality/morbidity +5%	(82.4)	(827.4)	(909.8)	(909.8)
Life/disability business only	(178.2)	(841.7)	(1,019.9)	(1,019.9)
Annuity business only	95.7	14.4	110.2	110.2
Mortality/morbidity -5%	71.5	912.5	984.0	984.0
Life/disability business only	173.0	927.8	1,100.8	1,100.8
Annuity business only	(101.5)	(15.4)	(116.9)	(116.9)
Required Capital (RC)				
Required Capital (RC) = Minimum solvency capital	0.0	23.2	23.2	23.2

5.2 Sensitivities of Value of New Business

Sensitivities have also been calculated for the Value of New Business (VNB). The following table shows the absolute deviation from the base value.

Table 9: Sensitivities of Value of New Business (VNB)

in EUR million	Domestic Operations	Foreign Operations	After consolidation Total
Basic Value of new business (VNB)	**84.7**	**228.9**	**313.6**
Sensitivities to economic assumptions			
Interest rate environment +100 bps	(10.4)	(18.6)	(29.0)
Interest rate environment -100 bps	12.0	18.5	30.6
Equity/property market value -10%	0.0	0.0	0.0
Swaption implied volatilities +25%	0.0	0.0	0.0
Sensitivities to non-economic assumptions			
Expenses -10%	4.0	5.9	9.9
Lapse +10%	(9.7)	(12.8)	(22.6)
Lapse -10%	6.2	12.3	18.5
Mortality/morbidity +5%	(30.8)	(49.8)	(80.7)
Life/disability business only	(33.4)	(50.8)	(84.2)
Annuity business only	2.6	0.9	3.5
Mortality/morbidity -5%	28.0	50.2	78.2
Life/disability business only	30.7	51.1	81.8
Annuity business only	(2.7)	(0.9)	(3.6)
Required Capital (RC)			
Required Capital (RC) = Minimum solvency capital	0.0	1.9	1.9

6. Reconciliation of IFRS Equity to Market Consistent Embedded Value / Embedded Value not Recognised

One of Hannover Re Life and Health's (Hannover Re L&H) strategic business fields is writing financing reassurance business. The acquisition of large volumes of financing business is only possible due to the financial support provided by the non-life segment of Hannover Re.

Within the segmental reporting this historic financing is shown as an inter-segmental liability from the life and health segment to the non-life segment ("bridge financing"). The impact of the bridge financing on the Hannover Re Group balance sheet is neutral as the liability for the life and health segment and the asset for the non-life segment cancel each other out.

Bridge financing on an after-minorities basis is EUR 712.0 million in 2012 compared to EUR 850.7 million in 2011. Bridge financing is shown as an asset for the non-life segment in the IFRS segment reporting. It is, however, not treated as a liability within the embedded value for the life and health business because the Market Consistent Embedded Value (MCEV) is based on local statutory accounts.

The "intra-company surplus notes" are the subordinated debt issued by the non-life segment to the Hannover Re L&H subsidiaries. Under IFRS the non-life segment does not show this subordinated debt as an asset and therefore the subordinated debt is included in the IFRS equity for the life and health segment. A part of this subordinated debt is included in the Shareholder Net Worth (SNW) of the US and UK subsidiaries, and therefore in the MCEV. The subordinated debt that is not included in the SNW has to be deducted to achieve the reconciliation between the IFRS equity and the MCEV.

Table 10 shows the reconciliation of the IFRS equity for the life and health segment to the MCEV. The Embedded Value not Recognised (EVNR) quantifies the shareholder interest in the life and health business in excess of the IFRS equity. The decrease in EVNR is mainly a result of the negative assumption changes, partly offset by the excellent Value of New Business.

Table 10: Reconciliation and Embedded Value not Recognised (EVNR) – after consolidation

in EUR million	2012	2011
IFRS equity before minorities	**2,084.4**	**1,823.3**
thereof minority capital	53.6	56.3
IFRS equity	**2,030.8**	**1,767.0**
Intra-company surplus notes	(321.5)	(327.3)
Bridge financing	712.0	850.7
Adjusted IFRS equity	**2,421.4**	**2,290.3**
Valuation differences	(1,442.8)	(1,184.9)
Value In-Force (VIF)	2,131.2	1,941.3
Other adjustments	24.1	19.0
Embedded Value not Recognised (EVNR)	**712.5**	**775.4**
Market Consistent Embedded Value (MCEV)	**3,133.9**	**3,065.8**

7. Assumptions

7.1 Economic Assumptions

7.1.1 Swap rates

The reference rates 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 reference rates. The reference rates do not include any liquidity premium.

Table 11: Swap yield curves as at year end 2012

in %	EUR	USD	GBP	AUD	ZAR
1 Year	0.30	0.33	0.68	2.80	4.96
2 Years	0.38	0.39	0.70	2.85	5.03
3 Years	0.44	0.48	0.77	3.08	5.26
4 Years	0.60	0.61	0.88	3.20	5.52
5 Years	0.77	0.82	1.02	3.32	5.75
6 Years	0.95	1.04	1.19	3.42	5.99
7 Years	1.12	1.24	1.37	3.52	6.21
8 Years	1.29	1.42	1.54	3.63	6.39
9 Years	1.43	1.59	1.72	3.73	6.56
10 Years	1.57	1.74	1.87	3.83	6.70
20 Years	2.16	2.49	2.76	4.25	7.07
30 Years	2.53	2.69	2.99	4.31	7.03

For the Market Consistent Embedded Value (MCEV) 2011 the following swap rates were used.

Table 12: Swap yield curves as at year end 2011

in %	EUR	USD	GBP	AUD	ZAR
1 Year	1.41	0.67	1.35	4.07	5.57
2 Years	1.31	0.72	1.33	4.05	5.84
3 Years	1.36	0.82	1.36	4.02	6.19
4 Years	1.54	0.99	1.44	4.22	6.51
5 Years	1.72	1.21	1.56	4.30	6.80
6 Years	1.89	1.41	1.72	4.40	7.02
7 Years	2.07	1.61	1.87	4.50	7.25
8 Years	2.17	1.75	2.01	4.53	7.36
9 Years	2.28	1.88	2.15	4.57	7.47
10 Years	2.38	2.02	2.29	4.60	7.59
20 Years	2.69	2.50	2.84	4.80	7.66
30 Years	2.56	2.59	3.01	4.61	7.62

7.1.2 Volatilities

Hannover Re Life and Health's (Hannover Re L&H) portfolio includes Financial Options and Guarantees (FOGs) in the United States and in South Africa. The economic scenarios for calculating the FOGs were generated using the 2 Factor Black-Karasinski Model with 1,000 scenarios.

The economic scenarios were calibrated using the following swaption implied volatilities. The FOGs were calculated based on economic assumptions as at the end of September 2012. The result was adjusted to reflect the change in the market between 30 September 2012 and 31 December 2012.

Table 13: US Dollar swaption volatilities as at 30 September 2012

in %	Swap term										
option period	1 year	2 years	3 years	4 years	5 years	7 years	10 years	15 years	20 years	25 years	30 years
1 year	34.40	34.19	33.90	33.53	33.08	31.94	29.84	26.48	23.98	22.11	20.55
2 years	34.64	34.39	34.06	33.65	33.15	31.93	29.81	26.58	24.18	22.34	20.78
3 years	35.51	35.26	34.92	34.51	34.00	32.80	30.79	27.79	25.50	23.67	22.08
4 years	35.35	35.07	34.70	34.25	33.73	32.51	30.55	27.67	25.45	23.62	22.04
5 years	35.09	34.79	34.40	33.94	33.41	32.23	30.40	27.67	25.50	23.68	22.08
7 years	34.66	34.26	33.80	33.28	32.73	31.60	29.94	27.52	25.48	23.69	22.09
10 years	32.75	32.27	31.77	31.26	30.73	29.66	28.08	25.68	23.57	21.69	20.03
15 years	30.16	29.67	29.17	28.66	28.17	27.19	25.75	23.46	21.38	19.54	17.95
20 years	28.18	27.73	27.26	26.78	26.30	25.33	23.84	21.52	19.46	17.69	16.20
25 years	25.65	25.21	24.75	24.28	23.78	22.77	21.27	18.94	16.90	15.25	13.92
30 years	23.69	23.24	22.76	22.28	21.80	20.83	19.38	17.15	15.34	13.88	12.74

The FOGs for the MCEV 2011 were calculated based on volatilities as at 30 November 2011. These volatilities are also model-based.

Table 14: US Dollar swaption volatilities as at 30 November 2011

in %	Swap term										
option period	1 year	2 years	3 years	4 years	5 years	7 years	10 years	15 years	20 years	25 years	30 years
1 year	44.35	44.18	44.73	44.30	44.11	42.62	39.39	35.56	32.91	30.08	28.02
2 years	44.04	43.78	44.29	43.75	43.49	41.87	38.58	34.84	32.24	29.42	27.39
3 years	43.55	43.19	43.68	43.05	42.73	41.04	37.72	34.08	31.55	28.72	26.72
4 years	42.87	42.41	42.91	42.22	41.86	40.17	36.84	33.33	30.83	28.04	26.02
5 years	42.01	41.48	42.02	41.31	40.94	39.26	35.98	32.57	30.10	27.37	25.31
7 years	39.93	39.39	40.06	39.40	39.03	37.40	34.29	31.06	28.62	26.03	23.81
10 years	36.67	36.25	37.13	36.61	36.34	34.80	31.93	28.89	26.49	24.02	21.65
15 years	32.23	31.99	33.08	32.76	32.63	31.27	28.58	25.80	23.44	21.01	18.62
20 years	29.09	28.96	30.09	29.91	29.81	28.58	25.84	23.22	20.89	18.56	16.29
25 years	26.78	26.69	27.78	27.65	27.54	26.39	23.56	21.06	18.76	16.55	14.51
30 years	24.93	24.85	25.88	25.78	25.66	24.52	21.60	19.22	17.01	14.97	13.15

7.1.3 Currency Exchange Rates

The following closing values were used for consolidation purposes:

Table 15: Equivalent in EUR of 1 unit of the original currency

Year	USD	GBP	AUD	ZAR
2012	0.75860	1.22257	0.78805	0.08923
2011	0.77246	1.19583	0.78595	0.09542

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 risk under the reassurance treaties is reflected within the Cost of Residual Non-Hedgeable Risks (CoRNHR). These risks mainly reflect the possible loss of unamortised initial financing in case the ceding company becomes insolvent.

7.1.6 Tax

The currently applicable average tax rates are:

Table 16: Tax rates in percentages

Australia	China	France	Germany	Hong Kong	Ireland
30.00	25.00	36.10	31.93	16.50	12.50
Korea	**Malaysia**	**South Africa**	**Sweden**	**UK**	**US**
22.00	25.00	34.51	22.00	23.00	22.55

The tax rate in Bermuda is 0.00% and the tax rate used for the business written by the Bahrain subsidiary is equal to the French tax rate.

The projections allow for tax losses to be carried forward.

7.2 Non-Economic Assumptions

7.2.1 Cost of Residual Non Hedgeable Risks

The cost of capital approach is described in Appendix I – Methodology. The capital charge was set up to 4.5% and the capital was determined at the 99.5% confidence level.

7.2.2 Mortality Improvements

Mortality improvement assumptions were used for the Domestic and Foreign Operations' annuity business in the UK market and also for certain mortality risk business, mainly reassurance treaties covering UK term assurances and traditional risk reassurance business in the United States.

7.3 Expenses

The total administration expenses for the year 2012 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.

Appendix

I. Methodology

Hannover Re has adopted the MCEV Principles. The embedded value calculations are performed using market consistent economic assumptions. Investment returns for all asset classes are assumed to be equal to the reference rates and explicit allowance is made to cover the Cost of Residual Non Hedgeable Risks (CoRNHR).

General Assumptions

- All calculations are based on the going concern approach, i.e. all entities remain in operation and continue writing new business.
- The Market Consistent Embedded Value (MCEV) is calculated using best estimate assumptions.
- All values are post-tax.
- Expense inflation was recognised for the MCEV calculations.
- Overhead expenses are included within the administrative expenses.
- No future new business is included in the calculations.
- No productivity gains are considered.

New Business

New business is defined as new reassurance treaties written or new policies written under existing treaties during the year. External retrocession of new business treaties is assumed to be negative new business.

The Value of New Business (VNB) is calculated at the point of sale and includes the profit or loss during the year in which the new business was sold.

Shareholder Net Worth

The Shareholder Net Worth (SNW) corresponds to the consolidated market value of the assets backing shareholders' funds after deduction of intangible assets, subordinated debt and any other element accounted for the in-force business. The SNW is divided into Required Capital (RC) and Free Surplus (FS).

The SNW is derived from the consolidation of the Net Asset Values of the following companies:

- Domestic Operations:
  - Hannover Rückversicherung AG (Hannover Re) – life and health segment
  - E+S Rückversicherung AG (E+S Rück) – life and health segment

- Foreign Operations (life and health subsidiaries):
  - Hannover Life Reassurance Africa Ltd, Johannesburg
  - Hannover Life Reassurance Company of America, Orlando
  - Hannover Life Re of Australasia Ltd, Sydney
  - Hannover Life Reassurance Bermuda Ltd, Hamilton
  - The life and health business of Hannover Re (Ireland) Plc, Dublin
  - Hannover Life Reassurance (UK) Ltd, Virginia Water

Hannover Re holds 100% of the shares of all life and health subsidiaries with the exception of the life and health segment of E+S Rück in which the shareholding is 63.69%.

Hannover Re and E+S Rück are both composite reinsurance companies writing life and non-life reinsurance business. The Net Asset Value of the companies included in the scope of the MCEV has been derived by making adjustments to the IFRS equity for the life and health segment.

For the subsidiary in Ireland, the SNW is derived separately for the life and health and non-life segments.

Required Capital

The RC is the amount of capital required to support covered business, i.e. the market value of the assets attributed to the covered business over and above those required to back liabilities for covered business, the distribution of which to shareholders is restricted.

The RC is always at least equal to the local Statutory Minimum Solvency Margin. The level of the RC for each business centre is set equal to the maximum of:

- The level of capital at which the local regulators are empowered to take action
- The level of capital required by rating agencies (in order to maintain the desired rating)
- The target capital level of the business unit
- Any other level of capital to achieve internal management objectives

The RC was set between 100% and 250% of the local Statutory Minimum Solvency Margin. The RC for the US and the UK subsidiaries includes intra-company surplus notes from the non-life segment to the extent that these are required to meet the target RC.

Free Surplus

The FS is the market value of any assets allocated to, but not required to support, the covered business.

Present Value of In-Force Business

The Present Value of In-Force Business (VIF) consists of:

- Present Value of Future Profits (PVFP)
- Time Value of Financial Options and Guarantees (FOGs)
- Cost of Residual Non-Hedgeable Risks (CoRNHR)
- Frictional Costs of Required Capital (FCoRC)

Present Value of Future Profits

The PVFP is the present value of projected statutory shareholders' profits (net of taxes) from the covered business in-force calculated on a certainty equivalent basis. The discount rates are spot rates derived from the reference rates.

Cost of Residual Non Hedgeable Risks

The MCEV Principles require an allowance for the cost of non-hedgeable risks not already allowed for in FOGs or PVFP.

The CoRNHR has been determined based on a cost of capital approach using an internal economic capital model. The capital has been determined consistent with a 99.5% confidence level over a one-year time horizon. Diversification benefits have been allowed within the non-hedgeable risks, but not between hedgeable and non hedgeable risks. The economic capital is projected forward using appropriate risk drivers (e.g. the premiums or mathematical reserves) and the present value is calculated using the reference rates.

The CoRNHR covers the following non-financial risks:

- Mortality risk
- Longevity risk
- Morbidity risk
- Disability risk
- Lapse risk
- Expense risk
- Pandemic risk
- Operational risk

as well as the cedents' counterparty risk and non hedgeable financial risks.

Frictional Costs of Required Capital

The FCoRC are defined as the tax on the projected investment returns and investment costs on assets backing the RC over the projected lifetime of the underlying risks.

Time Value of Financial Options and Guarantees

The majority of treaties either do not have significant FOGs or the assets and liabilities are well matched. The PVFP for these treaties has been calculated using deterministic projections. Stochastic models have been used to estimate the FOGs for the US and South African business with minimum interest guarantees. The time value of the FOGs is derived as the difference between PVFP on a certainty equivalent basis and the arithmetic mean of PVFP derived from a large number of stochastic scenarios.

In order to improve run times a simplified stochastic model is used to determine the FOGs. The assets are modelled as cash rather than using a synthetic asset portfolio. This approach increases the volatility of investment returns as well as the duration gap in the model. The simplified model produces a reasonable estimate of the FOGs.

Sensitivities

Interest rate 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 and future reinvestment rates also change. This sensitivity is not performed in isolation and there are associated impacts on most other economic assumptions.

Equity/property market value - 10%

This sensitivity indicates the impact of a sudden fall in the market values of these assets.

Swaption implied volatilities + 25%

This sensitivity shows the impact of an increase in swaption implied volatilities on the cost of options and guarantees.

Liquidity Premium + 10 bps

This sensitivity shows the impact of a liquidity premium of 10 bps applied to the forward rate for products where a liquidity premium could be earned. As the base run does not include any liquidity premium, this sensitivity implies a 10 bps liquidity premium applied to all treaties where a liquidity premium could be earned.

Expenses - 10%

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

Lapse +/- 10%

A 10% proportional increase/decrease in lapse rates is applied here, i.e. a multiplicative change in lapse rates.

Mortality/morbidity +/- 5%

The sensitivity has been performed for three different situations:

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

Required Capital

For the sensitivity 'Required Capital = minimum solvency capital' the amount of RC is set equal to the level of solvency capital at which the regulator is empowered to take action.

II. Glossary

APE	**Annual Premium Equivalent**
APEM	**Annual Premium Equivalent Margin**
CoRNHR	**Cost of Residual Non-Hedgeable Risks** Explicit allowance for residual non-hedgeable financial and non-financial risks
EVNR	**Embedded Value not Recognised** Shareholder interest in the life and health business in excess of the IFRS equity
FCoRC	**Frictional Costs of Required Capital** Taxation and cost of asset management on the assets backing the Required Capital
FOGs	**Financial Options and Guarantees** Time value of financial options und guarantees; determined with stochastic techniques consistent with the methodology and assumptions used in the underlying MCEV
FS	**Free Surplus** The market value of any capital and surplus allocated to, but not required to support, the in-force covered business at the valuation date
MCEV	**Market Consistent Embedded Value** Defined as the present value of future distributable earnings of the business in-force plus the portion of capital and surplus that is not needed to support the business in-force; methodology in line with the MCEV Principles of the CFO-Forum
NBM	**New Business Margin**
NBP	**New Business Premium current year**
NBRP	**New Business Regular Premium**
NBSP	**New Business Single Premium**
P/L(NB)	**Profit or Loss on New Business during the year**
PVFP	**Present Value of Future Profits** The present value of future shareholder profits projected to emerge from the assets backing liabilities of the in-force covered business
PVNB	**Present Value of New Business Profits**
PVNBP	**Present Value of New Business Premium**
RC	**Required Capital** Assets attributed to the covered business over and above those required to back liabilities for covered business, the distribution of which to shareholders is restricted
SNW	**Shareholder Net Worth** FS plus RC
VIF	**Value In-Force** The present value of future shareholder profits projected to emerge from the in-force covered business and the assets backing the associated liabilities after allowance for FOGs, CoRNHR and FCoRC
VNB	**Value of New Business**

III. Formulae and Abbreviations

MCEV = SNW + VIF	
MCEV	Market Consistent Embedded Value
SNW	Shareholder Net Worth
VIF	Value of In-Force covered business
SNW = FS + RC	
SNW	Shareholder Net Worth
FS	Free Surplus
RC	Required Capital
VIF = PVFP – CoRNHR – FCoRC – FOGs	
VIF	Value of In-Force covered business
PVFP	Present Value of Future Profits based on a certainty equivalent approach including Pension Deficits and Look Through
CoRNHR	Cost of Residual Non-Hedgeable Risks
FCoRC	Frictional Costs of Required Capital
FOGs	Time Value of Financial Options and Guarantees
CoRNHR = CoCF * EC	
CoRNHR	Cost of Residual Non-Hedgeable Risks
CoCF	Cost of Capital Factor (percentage)
EC	Economic Capital (present value) based on the 99.5% percentile confidence level
FOGs = PVFP – Mean Stochastic PVFP	
FOGs	Time Value of Financial Options and Guarantees
PVFP	Present Value of Future Profits based on a certainty equivalent approach including Pension Deficits and Look Through
Mean Stochastic PVFP	Derived from a large number of stochastic scenarios
Return on MCEV = $\frac{\text{Closing MCEV – Closing Adjustments – Adjusted Opening MCEV}}{\text{Adjusted Opening MCEV}}$	
VNB = P/L + PVNB – CoRNHR – FCoRC – FOGs	
VNB	Value of New Business
P/L	Profit or Loss on New Business during the current year
PVNB	Present Value of New Business future profits
CoRNHR	Cost of Residual Non-Hedgeable Risks on New Business
FCoRC	Frictional Costs of Required Capital on New Business
FOGs	Value of FOGs on New Business
NBM = $\frac{\text{VNB}}{\text{NBP + PVNBP}}$	
NBM	New Business Margin
VNB	Value of New Business
NBP	New Business Premium during the current year
PVNBP	Present Value of New Business future Premium
APEM = $\frac{\text{VNB}}{\text{APE}} = \frac{\text{VNB}}{\text{NBRP + 10\% NBSP}}$	
APEM	Annual Premium Equivalent Margin
VNB	Value of New Business
APE	Annual Premium Equivalent
NBRP	New Business Regular Premium
NBSP	New Business Single Premium

IV. Overview of Domestic Operations

Covered business Domestic Operations
Hannover Rückversicherung AG, Hannover
E+S Rückversicherung AG, Hannover
Hannover Rückversicherung AG Succursale Française, Paris
Hannover Rückversicherung AG Tyskland filial, Stockholm
Hannover Rückversicherung AG Malaysian Branch, Kuala Lumpur
Hannover Rückversicherung AG Hong Kong Branch, Hong Kong
Hannover Rückversicherung AG Korea Branch, Seoul
Hannover Rückversicherung AG Shanghai Branch, Shanghai
Hannover Re Takaful B.S.C. (c), Bahrain

V. Overview of Foreign Operations

Covered business Foreign Operations
Hannover Life Reassurance Africa Ltd, Johannesburg
Hannover Life Reassurance Company of America, Orlando
Hannover Life Re of Australasia Ltd, Sydney
Hannover Life Reassurance Bermuda Ltd, Hamilton
The life and health business of Hannover Re (Ireland) Plc , Dublin
Hannover Life Reassurance (UK) Ltd, Virginia Water

VI. Summary of Tables

VII. Disclaimer

The information provided in this report in no way whatsoever constitutes 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, mainly bulk data, which do not allow exact specifications as to the portfolio composition.

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

VIII. Letter of Opinion (B&W Deloitte GmbH)

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22 April 2013

Review of the Market Consistent Embedded Value of the Life & Health segment of Hannover Rück SE (formerly known as Hannover Rückversicherung AG) as at 31 December 2012

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

Hannover Re has determined the Market Consistent Embedded Value ("MCEV") results of Hannover Re Life and Health for 2012 as set out in the Statements of Market Consistent Embedded Value (together "the Statements") on a basis consistent with the requirements of the European Insurance CFO Forum Market Consistent Embedded Value Principles©[1] ("MCEV Principles"). These Statements, the methodologies applied and the assumptions underlying them are each the sole responsibility of the Board of Directors ("the Directors") of Hannover Re.

The Statements have been prepared by Hannover Re as the aggregate of separate Market Consistent 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 MCEV has been calculated.

The calculation of MCEVs necessarily makes numerous assumptions with respect to economic conditions, operating conditions, taxes, and other matters, many of which are beyond Hannover Re'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 MCEV and such variation may be material. Deviations from assumed experience are normal and are to be expected.

The resulting MCEV does not purport to be a market valuation of Hannover Re 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 and assumptions and calculations made by the Directors to determine the MCEV for the businesses concerned and their aggregation into the consolidated MCEV of Hannover Re Life and Health.

The non hedgeable risk based capital, which is the basis for the calculation of the cost of residual non hedgeable risks, has been determined by Hannover Re using an internal capital model. We have not reviewed the internal model or the level of non hedgeable risk based capital. Hannover Re has decided to not publish the Group Embedded Value as required by the MCEV Principles.

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 Hannover Re and its subsidiaries, including the book value of the net assets as disclosed in Hannover Re'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, with the exceptions highlighted in the scope of the B&W Deloitte review above, the MCEV methodology as approved by the Directors of Hannover Rück SE is appropriate, the assumptions taken together are reasonable and the estimate of the Market Consistent Embedded Value have been accurately compiled consistent with the "MCEV Principles".

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

B+W Deloitte GmbH

B&W Deloitte GmbH

Published by
Hannover Rück SE
Karl-Wiechert-Allee 50
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