

MUNICH RE
MARKET CONSISTENT EMBEDDED VALUE REPORT 2009



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1 Introduction

1.1 Scope of disclosure

In June 2008 the European Insurance CFO Forum ('CFO Forum') published the Market Consistent Embedded Value Principles^{®*} ('MCEV Principles'), in order to bring greater consistency and improved disclosure to the European insurance industry's embedded value disclosures. Throughout this document MCEV as well as embedded value refer to the above MCEV Principles.

In October 2009, the CFO Forum published an amendment to the MCEV Principles to allow for the inclusion of a liquidity premium. However, discussion how and to which products to apply such premiums is still ongoing. Therefore Munich Re follows a prudent approach and does not apply any liquidity premiums in its current valuation. To illustrate the impact of a liquidity premium on our business we state the respective sensitivities.

For the reporting years 2005 until 2008 our valuation was based on the European Embedded Value Principles ('EEV Principles'), published by the CFO Forum in May 2004. Since 2005 Munich Re has applied a strictly market-consistent approach by using swap rates and implied volatilities as at each valuation date (for details, see Section 5.13). The transition from EEV Principles to MCEV Principles affects the way we calculate the cost of residual non hedgeable risks.

In our EEV framework the allowance for the cost of residual non hedgeable risks was deducted by applying a business specific spread on the risk-free rate. Please note that in the previous reports this allowance was referred to as frictional cost.

According to the MCEV Principles the cost of residual non hedgeable risks (CRNHR) is now calculated as the present value of the product of a uniform cost rate and the economic risk capital for residual non hedgeable risks (ERCNHR) calibrated to a 99.5% VaR. Deviant to the current MCEV Principles but in anticipation of future changes the ERCNHR takes into account the diversification of all non hedgeable risks in our books, not only those of the covered business.

Also Munich Re does not report its Group MCEV. In all other respects we fully comply with the MCEV Principles.

In this supplement, the following topics are reported for our covered reinsurance and primary insurance business:

- // The restatement of the embedded value as at 31 December 2008 according to the MCEV Principles
- // The Market Consistent Embedded Value as at 31 December 2009
- // An analysis of embedded value earnings for 2009
- // A reconciliation of embedded value with IFRS equity
- // An analysis of the sensitivities of the embedded value and value of new business as at 31 December 2009
- // A detailed description of the embedded value methodology applied

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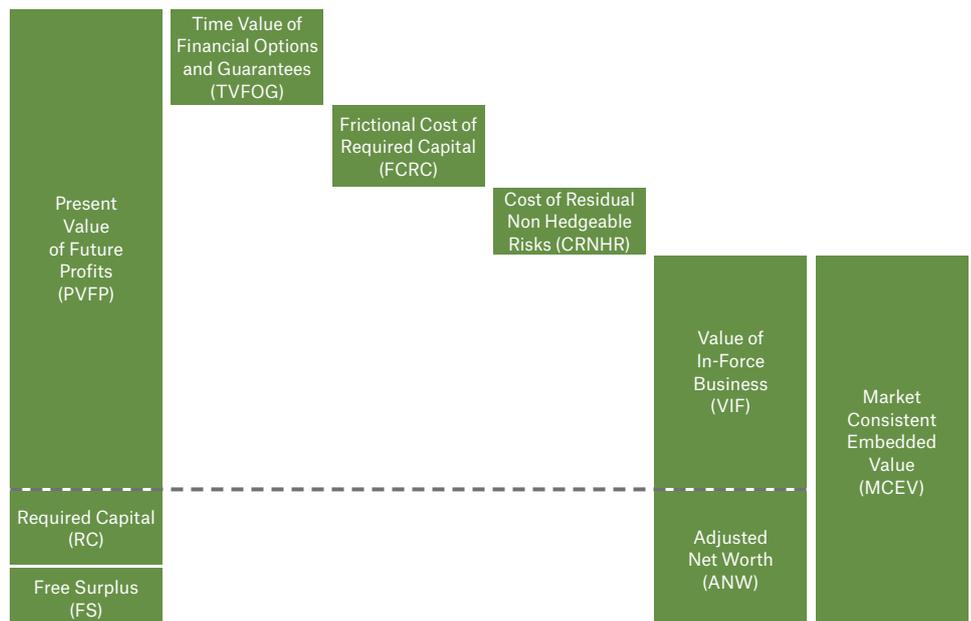
1.2 Covered business

This embedded value report covers 100% of the life reinsurance business written by Munich Re and more than 94% of business written in the primary life and German health entities of Munich Re. German primary health business is long-term business and is therefore included, whereas medical reinsurance business is short-term in nature and therefore excluded. For a detailed list of Munich Re segments and entities covered in this report refer to Sections 5.14 to 5.17.

1.3 Definition of Market Consistent Embedded Value

The embedded value is the present value of shareholders' interests in the earnings distributable from assets allocated to covered business after making sufficient allowance for the aggregate risks involved. The MCEV Principles discern the following components of the embedded value:

- // The adjusted net worth (ANW) broken down into the components
 - free surplus (FS) and
 - required capital (RC).
- // The value of in-force covered business (VIF), subdivided into
 - present value of future profits (PVFP)
 - time value of financial options and guarantees (TVFOG)
 - frictional cost of required capital (FCRC)
 - cost of residual non hedgeable risks (CRNHR) .



All components are net of taxes, minority interests and policyholder participations (where applicable). The present value of future profits (PVFP) already includes the intrinsic value of all financial options and guarantees; their time value is separately disclosed. Any non hedgeable risks that are not already reflected in the PVFP or TVFOG are covered by the cost of residual non hedgeable risks. The CRNHR is calculated using a cost of capital approach, i.e. given by the product of projected risk capital for non hedgeable risk times the respective cost rate. The frictional cost of required capital consists of the projected tax to be paid as well as fees for the management of these assets and, only for German primary health, the policyholder participation on the earnings from the assets backing required capital. A detailed description of the MCEV methodology used for preparing this supplement is given in Section 5.

2 Overview of embedded value results 2009

Since 2005 Munich Re has adhered to a prudent and strict market consistent framework. Our prudent approach is proven by a good track record regarding experience variances and assumption changes in recent years. As last year, we refrain from applying any liquidity premium in our valuation.

The change in embedded value from European Embedded Value as at 31 December 2008 to the Market Consistent Embedded Value as at 31 December 2009 is driven by the restatement, strong MCEV operating earnings and economic variances.

Highlights	Reinsurance	Primary Insurance	Total
€m			
European Embedded Value 31.12.2008	6,116	3,509	9,625
MCEV restatement	-1,459	-43	-1,502
Market Consistent Embedded Value 31.12.2008	4,657	3,466	8,123
Opening adjustments	306	349	655
Adjusted MCEV 31.12.2008	4,963	3,815	8,778
Value of new business	562	132	694
Expected return at reference rate	196	162	359
Expected return in excess of reference rate	0	10	10
Experience variances	145	130	275
Assumption changes	113	5	118
Other operating variance	-126	-132	-258
Operating MCEV earnings 2009	891	307	1,198
Economic variances	712	1,192	1,904
Other non operating variances	13	-1	12
Total MCEV earnings 2009	1,616	1,497	3,113
Closing adjustments	194	-187	7
Market Consistent Embedded Value 31.12.2009	6,773	5,126	11,899
IFRS equity excluding goodwill	4,202	3,660	7,862
Value not recognised in IFRS equity	2,571	1,466	4,037

The effect of the restatement (-€1,502m) stems almost solely from our reinsurance business. The refined calculation of the CRNHR using a cost of capital approach with a cost rate of 7% on the ERCNHR reduced embedded value by €976m. Furthermore a transfer of free surplus from our covered to our non-covered reinsurance led to a further reduction.

Operating earnings were strong at €1,198m especially due to an excellent new business development in our reinsurance entities.

The recovery of financial markets generated economic variances of €1,904m. Total embedded value earnings of the covered business of Munich Re were at €3,113m.

Our MCEV increased by 46.5% to €11,899m and the value not recognised in IFRS equity by 181.7% to €4,037m.

3 Reinsurance



The development of the embedded value was characterised by two major effects. The restatement from a market consistent embedded value based on the EEV Principles to an embedded value based on MCEV Principles led to a reduction of the restated embedded value as at 31 December 2008. Very strong embedded value earnings more than compensated this reduction and led to a rise of the embedded value by 45.4% compared with the restated value.

Despite the financial crisis 2009 was a successful year for our life reinsurance business. The value of in-force covered business increased by 67.0%. This strong increase was supported by a remarkably high value of new business 2009 of €562m. We profited especially from a number of large financially-motivated business opportunities that arose as a result of Munich Re's financial strength during the capital market turmoil. These transactions over-compensated effects from increasing pressure on available traditional reinsurance volumes and margins visible in certain markets as well as the recession impact of somewhat reduced business production on the primary insurance side in certain lines of business and geographical areas.

The embedded value components for our reinsurance business are presented in the following table. As at 31 December 2008 the table displays both, the embedded value based on the EEV Principles as published in last year's report and the embedded value restated according to the MCEV Principles.

MCEV Components	31.12.2009	31.12.2008	31.12.2008
	MCEV	MCEV	EEV
€m			
Present value of future profits (PVFP)	5,599	4,501	4,561
Time value of financial options and guarantees (TVFOG)	-32	-82	-75
Frictional costs of required capital (FCRC)*	-377	-314	-200
Cost of residual non hedgeable risks (CRNHR)*	-1,252	-1,747	-771
Value of in-force covered business (VIF)	3,938	2,358	3,515
Free surplus (FS)	564	472	865
Required capital (RC)	2,271	1,827	1,736
Adjusted net worth (ANW)	2,836	2,299	2,601
Market Consistent Embedded Value (MCEV)	6,773	4,657	6,116

* Our EEV framework published last year used different terminology. Last year's cost of required capital for tax and investment expenses is now subsumed as FCRC, whereas the frictional cost is now replaced by CRNHR.

The **restated market consistent embedded value** as at 31 December 2008 based on the MCEV Principles was 23.9% lower at €4,657m than the market consistent embedded value based on the EEV Principles (€6,116m). This significant change is mainly driven by the explicit calculation of the CRNHR not already allowed for in the TVFOG or the PVFP, using a cost of capital approach based on our economic risk capital model. The CRNHR substitutes the previous years' frictional cost approach of applying a spread on the risk free discount rate. The net impact of this replacement was a decrease in VIF by €976m. We show last year's allowance for non hedgeable risks in the same row as the CRNHR.

Furthermore, the restated embedded value as at 31 December 2008 includes an adaption of the required capital which led to an increase in the frictional costs on required capital. The required capital now is based on the level of solvency capital at which the supervisor is empowered to take any action and includes amounts required to meet additional regulatory requirements and internal objectives. As a side effect the free surplus assigned to the covered business was reduced by €393m. On Munich Re Group level there was an off-setting effect in the non-covered business.

Given the aforementioned effects, the application of the MCEV Principles to the calculation of the **value of new business** (VNB) 2008 would have led to a VNB 2008 of €264m (compared to the VNB 2008 of €356m based on a market consistent application of the EEV Principles). After the restatement the VNB as well as the MCEV decreased to approximately three quarters of the respective EEV figures.

Over the year 2009 the total embedded value earnings show a very beneficial development with an increase of 32.6%. Detailed explanations follow later in this section.

The **time value of financial options and guarantees** as at 31 December 2009 is moderate. This results from the fact that within life reinsurance business we concentrate on taking biometric risks so that the business only has a minor exposure to capital market risks. Furthermore, implied volatilities were lower at the end of 2009 than at the end of the previous year.

The **frictional costs** on required capital as well as the adjusted net worth grew in line with the PVFP. The **CRNHR** benefited from a better risk diversification as well as from higher discounting effects.

The change in **required capital** in 2009 from €1,827 as at 31 December 2008 to €2,271m as at 31 December 2009 was driven by two factors. Firstly, due to the increase in business the required capital for new business is with €610m almost twice as large as the required capital released by the run-off of existing business (€322m). Additionally, changes in foreign exchange rates increased the required capital in the reporting currency by €156m.

The total required capital for covered business as at 31 December 2009 of €2,271m exceeds the capital required at life reinsurance level to cover all minimum solvency requirements by €629m.

The change in embedded value in 2009 is shown in the following table:

Earnings on MCEV analysis	Free surplus	Required capital	VIF	MCEV
€m				
Opening MCEV	472	1,827	2,358	4,657
Opening adjustments	31	96	179	306
Adjusted opening MCEV	503	1,924	2,537	4,963
Value of new business	-653	610	605	562
Expected return at reference rate	13	14	169	196
Expected return in excess of reference rate	-	-	-	-
Transfers from VIF and required capital to free surplus	279	-72	-207	-
Experience variances	157	-98	86	145
Assumption changes	296	-203	21	113
Other operating variance	-7	3	-122	-126
Operating MCEV earnings	85	255	552	891
Economic variances	46	34	632	712
Other non operating variance	-70	-	84	13
Total MCEV earnings	60	288	1,268	1,616
Closing adjustments	1	60	133	194
Closing MCEV	564	2,271	3,938	6,773

The **opening adjustments** of €306m represent foreign exchange adjustments from the beginning of the year exchange rates to the average of year exchange rates used in the MCEV earnings analysis.

Almost two thirds of the operating MCEV earnings originated from the favourable **value of new business** 2009. With €562m the VNB 2009 has more than doubled compared to the (restated) VNB 2008 (€264m). This impressive VNB 2009 was supported by large block deals aiming to provide capital relief for customers particularly in North America, the employment of growth opportunities in Asia, an increase in variable annuities business as well as sustainable increases in new business volumens in diverse geographical areas.

Due to decreased short-term risk-free interest rates at the end of 2008 for the major currencies the **expected return** of €196m is notably lower than in 2008 (€326m).

Better than expected mortality developments and more favourable than expected lapse experience led to **experience variances** of €145m.

The **operating assumption changes** strengthened the embedded value in aggregate by €113m mainly due to updates of mortality assumptions in our North American business.

The position **other operating variance** shows model changes resulting from the continuous refinement of embedded value calculation models especially for our US business.

The **economic variances** have a substantial positive impact on the embedded value. Tightened credit spreads increased the present value of future profits especially of our North American business.

Overall we observed very satisfying **operating embedded value earnings** of 18.0% and total embedded earnings of 32.6%.

New business	2009 MCEV	2008 EEV
€m		
Value of new business (VNB)	562	356
Present value of new business premiums (PVNBP)	10,576	5,721
Annual premium equivalent (APE)	1,916	646
%		
New business margin (VNB/PVNBP)	5.3	6.2
VNB/APE	29.3	55.1

In line with the favourable value of new business, the present value of new business premiums as well as the annual premium equivalent show a significant increase compared to last year. Due to the nature of parts of the new business such as financially motivated transactions that result in high premium volumes the profitability measures in percentage of the present value of new business premium and the annual premium equivalent decreased.

IFRS reconciliation	31.12.2009 MCEV	31.12.2008 MCEV	31.12.2008 EEV
€m			
IFRS equity	4,202	3,598	3,900
- Thereof goodwill	0	0	0
IFRS equity excluding goodwill	4,202	3,598	3,900
Market Consistent Embedded Value	6,773	4,657	6,116
Value not recognised in IFRS equity	2,571	1,058	2,216

The embedded value of the covered business as at 31 December 2009 exceeds the corresponding IFRS equity (excluding goodwill) by €2,571m, compared to €2,216 in the previous year on the EEV basis and compared to €1,058m on a (restated) MCEV basis.

Sensitivities for embedded value as at 31 December 2009:

Sensitivities MCEV and VNB	MCEV			VNB		
	€m	€m	%	€m	€m	%
Base case	6,773			562		
Interest rates and assets						
Interest rates -100bp	7,039	265	3.9	543	-19	-3.4
Interest rates +100bp	6,507	-267	-3.9	564	1	0.2
Equity/property values -10%	6,771	-3	-	562	-	-
Equity/property implied volatilities +25%	6,762	-11	-0.2	561	-1	-0.2
Swaption implied volatilities +25%	6,772	-1	-	561	-1	-0.2
Liquidity premium 10bp	6,802	29	0.4	565	3	0.5
Expenses and persistency						
Maintenance expenses -10%	6,847	73	1.1	575	13	2.3
Lapse rates -10%	6,717	-57	-0.8	562	-	-
Lapse rates +10%	6,799	25	0.4	557	-5	-0.9
Insurance risk						
Mortality/morbidity (life business) -5%	8,095	1,321	19.5	692	130	23.1
Mortality (life business) +5%	5,637	-1,137	-16.8	452	-110	-19.6
Mortality (annuity business) -5%	6,764	-10	-0.1	562	-1	-0.1
No mortality improvements (life business)	4,258	-2,516	-37.1	297	-265	-47.1
Morbidity (life business) +5%	6,591	-183	-2.7	540	-23	-4.0
Required capital						
Minimum solvency capital	6,850	76	1.1	na	na	na
Other						
Value of original currencies -10%	6,199	-575	-8.5	515	-47	-8.3

Our reinsurance business is dominated by insurance risks. While changes in the mortality or morbidity assumptions have a strong impact on the embedded values and the value of new business, changes of economic assumptions show a minor effect on the MCEV.

The sensitivity of exchange rates relative to the reporting currency reflects the high proportion of business written in foreign currencies. More than 80% of the business is denominated in foreign currencies, especially in the Canadian dollar and the US dollar.

Munich Re's embedded value is calculated without taking a liquidity premium into consideration. We show the impact of a liquidity premium of 10bp as a sensitivity.

Except for the stressed assumptions the sensitivity calculations are performed in analogy to the base case.

4 Primary insurance



MCEV Components €m	Primary insurance (Total)		
	31.12.2009 MCEV	31.12.2008 MCEV	31.12.2008 EEV
Present value of future profits (PVFP)	4,486	4,058	4,352
Time value of financial options and guarantees (TVFOG)	-574	-1,630	-1,624
Frictional costs of required capital (FCRC)*	-712	-618	-605
Cost of residual non hedgeable risks (CRNHR)*	-332	-345	-615
Value of in-force covered business (VIF)	2,867	1,465	1,508
Free surplus (FS)	268	182	182
Required capital (RC)	1,990	1,819	1,819
Adjusted net worth (ANW)	2,258	2,001	2,001
Market Consistent Embedded Value (MCEV)	5,126	3,466	3,509

* Our EEV framework published last year used different terminology. Last year's cost of required capital for tax, investment expenses and profit sharing of investment income is now subsumed as FCRC, whereas the frictional cost is now replaced by CRNHR.

The recovery of financial markets had a very positive effect on the embedded value of our primary business. In particular, the value of our German primary life business recovered most of last year's losses. Higher interest rates and lower implied volatilities reduced the TVFOG of our life business by two thirds compared to 2008.

The change from our published EEV 2008 to our MCEV 2009 is attributed to the **restatement from EEV to MCEV Principles** as at the end of 2008 and the value added analysis of 2009 based on MCEV Principles.

In our market consistent EEV framework the cost of residual non hedgeable risks was calculated by applying a spread of 50bp (100bp for German primary health) to the risk-free discount rates. For our MCEV framework we use a cost of capital approach, based on the projected economic risk capital for non hedgeable risks and a uniform cost rate. Overall this changeover had only a small effect on the embedded value of our primary business.

Applying a spread on discount rates on relatively low profits for German primary life for the EEV 2008 yielded relatively low CRNHR. The explicit calculation using the cost of capital approach led to an increase from €109m to €227m for 2008.

The effects for International primary life were contrary to those in Germany. A different product mix as well as more symmetric profit sharing between policyholder and shareholder results in a lower risk capital for non hedgeable risks. Consequently the CRNHR has decreased in comparison to last year from €111m to €47m.

German primary life			International primary life			German primary health		
31.12.2009	31.12.2008	31.12.2008	31.12.2009	31.12.2008	31.12.2008	31.12.2009	31.12.2008	31.12.2008
MCEV	MCEV	EEV	MCEV	MCEV	EEV	MCEV	MCEV	EEV
1,736	1,349	1,349	845	961	961	1,905	1,749	2,042
-652	-1,366	-1,359	78	-265	-265	-	-	-
-288	-205	-205	-83	-74	-74	-342	-340	-326
-200	-227	-109	-48	-47	-111	-85	-72	-396
596	-448	-325	792	576	512	1,479	1,337	1,320
-	-	-	268	182	182	-	-	-
1,121	1,033	1,033	377	324	324	493	462	462
1,121	1,033	1,033	645	506	506	493	462	462
1,717	585	708	1,438	1,082	1,018	1,971	1,799	1,783

Due to the potential of discretionary premium adjustments in German primary health business, the underlying risk capital for non hedgeable risks is relatively small. The explicit calculation decreased the CRNHR by €324m compared to the across-the-board calculation in 2008. Additionally, to reflect the uncertainty of the German health reform ("Gesundheitsreform") in the calculation of the EEV 2008, German primary health used an additional 50bp spread on the risk-free discount rate. Now impacts and anticipated management action are directly reflected in the PVFP. In combination the restated VIF for 2008 increased by €17m.

In aggregate the restatement from European Embedded Value to Market Consistent Embedded Value as at 31 December 2008 led to a small decrease of €43m in embedded value.

The MCEV for our primary business increased by 47.9% from €3,466m to €5,126m, mainly driven by the recovery of capital markets in 2009. Therefore, the embedded value earnings 2009 are dominated by economic variances.

Details of the change from MCEV 2008 to MCEV 2009 are explained in the following analysis of MCEV earnings.

Earnings on MCEV analysis €m	Primary insurance			MCEV
	Free surplus	Required capital	VIF	
Opening MCEV	182	1,819	1,465	3,466
Opening adjustments	34	136	179	349
Adjusted opening MCEV	216	1,955	1,644	3,815
Value of new business	-43	-59	234	132
Expected return at reference rate	5	5	152	162
Expected return in excess of reference rate	-	-	9	10
Transfers from VIF and required capital to free surplus	404	-2	-402	-
Experience variances	-115	8	237	130
Assumption changes	-1	-	5	5
Other operating variance	-2	-1	-130	-132
Operating MCEV earnings	249	-49	107	307
Economic variances	76	-	1,116	1,192
Other non operating variance	-	-	-1	-1
Total MCEV earnings	325	-49	1,221	1,497
Closing adjustments	-273	84	2	-187
Closing MCEV	268	1,990	2,867	5,126

The **opening adjustments** of €349m reflect the increase in the shares of ERGO Versicherungsgruppe AG as well as the addition of Vorsorge Lebensversicherung AG and Vorsorge Luxemburg Lebensversicherung S.A. Large parts of our primary business are denominated in euro, therefore, foreign exchange adjustments do not have a material impact.

Profitable **new business** increased the embedded value by €132m. More details are given below.

The **expected return at reference rate** generated €162m. As our equity and property exposure is small, the additional **expected return in excess of reference rate** led to a moderate contribution of €10m.

Positive **experience variances** were mainly caused by the reduction of mismatch between assets and liabilities during 2009, which overcompensated a lower than expected shareholder participation for German primary life business. In the context of the German health reform lower than expected lapse rates and various effects from our international businesses contributed to experience variances of €130m in total.

Since positive effects from our health business were almost offset by negative impacts from German primary life business, **assumption changes** (€5m) were small. Adjustments to best estimate assumptions for lapse rates and morbidity as well as a reduced shareholder participation resulted in negative operating assumption changes of €158m for German primary life. For German primary health an optimised asset allocation and reduced future expense assumptions led to changes of €166m. For international primary life an improved mortality outlook combined with an increase of expenses reduces earnings by €4m.

Other operating variance (-€132m) are mainly driven by model refinements (e.g. improved asset modelling, transition to Libor Market Model, modelling of the newly established tax grouping within covered business of ERGO). Based on the experience of last year's financial crisis, the underlying stochastic scenarios were generated using a more sophisticated calibration. In German primary health, the modelling of premium adjustments was improved.

German primary life				International primary life				German primary health			
Free surplus	Required capital	VIF	MCEV	Free surplus	Required capital	VIF	MCEV	Free surplus	Required capital	VIF	MCEV
-	1,033	-448	585	182	324	576	1,082	-	462	1,337	1,799
7	80	56	144	23	31	58	112	4	24	66	94
7	1,113	-392	728	205	355	634	1,194	4	486	1,403	1,893
-1	-68	113	45	-42	7	87	51	-	2	34	36
-	-	88	88	5	4	28	37	-	-	37	38
-	-	3	3	-	1	-	1	-	-	6	6
272	-	-272	-	73	-2	-71	-	59	-	-59	-
-97	-	179	82	-19	8	30	19	1	-	29	29
4	-	-161	-158	-	-	-4	-4	-4	-	170	166
-3	-	-5	-8	1	-1	-22	-21	-	-	-103	-103
175	-68	-55	52	18	17	48	83	56	2	114	172
-5	-	1,044	1,039	46	-	111	156	35	-	-39	-4
-	-	-	-	-	-	-1	-1	-	-	-	-
170	-68	988	1,091	64	17	157	238	90	2	76	168
-178	75	-	-103	-1	5	2	6	-94	4	-	-90
-	1,121	596	1,717	268	377	792	1,438	-	493	1,479	1,971

In summary operating MCEV earnings were at €307m, which corresponds to 8.0% relative to the adjusted opening MCEV.

More favourable economic assumptions led to large **economic variances** of €1,192m for primary insurance. Most of this increase stems from our German primary life business (€1,039m) which is characterised by substantial financial options and guarantees. Almost half of this effect can be attributed to the lower TVFOG; the remaining variance is reflected in the PVFP. Thus a good portion of last year's economic losses were recovered.

International primary life is less exposed to changes in economic assumptions, therefore the normalisation of capital markets had a comparatively smaller impact (€156m). In German primary health business premium adjustments offset falling interest rates. This option of transferring parts of financial market risk to the policyholder avoided losses in 2008. Consequently Primary health business did not benefit from improved economic assumptions.

Altogether total MCEV earnings were at €1,497m (or 39.2% relative to the adjusted opening MCEV). **Closing adjustments** are predominated by dividends; currency movements were insignificant.

In total the MCEV for primary insurance increased by 47.9% to €5,126m as at the end of 2009.

New business	Primary insurance (Total)		German primary life		International primary life		German primary health	
	2009	2008	2009	2008	2009	2008	2009	2008
	MCEV	EEV	MCEV	EEV	MCEV	EEV	MCEV	EEV
€m								
Value of new business (VNB)	132	-45	45	-111	51	26	36	40
Present value of new business premiums (PVNBP)	7,242	6,804	3,775	3,525	1,212	875	2,255	2,404
Annual premium equivalent (APE)	560	692	279	435	148	120	133	137
%								
New business margin (VNB/PVNBP)	1.8	-0.7	1.2	-3.1	4.2	3.0	1.6	1.7
VNB/APE	23.6	-6.5	16.0	-25.5	34.5	21.7	27.4	29.2

The present value of new business premiums for international primary life for 2008 and as result the PVNBP for primary insurance in total as well as the relative margins had to be corrected.

The value of new business for primary insurance was also supported by the recovery of financial markets and increased from -€45m to €132m.

Outside Germany new business was mainly written by our Belgian, Austrian and Polish companies; with a considerable increase to new business volumes in Belgium. In addition, compared to last year more profitable products with lower financial guarantees were sold.

In the light of the highly competitive German primary health market, the slight decrease in value of new business for that segment to €36m was tolerable.

IFRS reconciliation	31.12.2009	31.12.2008	31.12.2008
	MCEV	MCEV	EEV
€m			
IFRS equity	4,818	4,308	4,308
- Thereof goodwill	1,158	1,217	1,217
IFRS equity excluding goodwill	3,660	3,092	3,092
Market Consistent Embedded Value	5,126	3,466	3,509
Value not recognised in IFRS equity	1,466	375	417

The embedded value of covered primary insurance business as at 31 December 2009 exceeds the corresponding IFRS equity (excluding goodwill) by €1,466m. The value not recognised in IFRS equity rose by €1,091m as at the end of 2009.

Sensitivities MCEV and VNB	MCEV			VNB		
	€m	€m	Change %	€m	€m	Change %
Base case	5,126			132		
Interest rates and assets						
Interest rates -100bp	3,952	-1,173	-22.9	67	-65	-49.1
Interest rates +100bp	5,711	585	11.4	218	86	64.8
Equity/property values -10%	5,032	-94	-1.8	124	-8	-6.3
Equity/property implied volatilities +25%	5,071	-54	-1.1	127	-5	-4.0
Swaption implied volatilities +25%	5,162	37	0.7	147	15	11.3
Liquidity premium 10bp	5,259	133	2.6	139	7	5.0
Expenses and persistency						
Maintenance expenses -10%	5,202	77	1.5	140	8	6.2
Lapse rates -10%	5,158	33	0.6	148	16	11.8
Lapse rates +10%	5,099	-27	-0.5	130	-2	-1.4
Insurance risk						
Mortality/morbidity (life business) -5%	5,181	55	1.1	141	9	6.9
Mortality (life business) +5%	5,102	-23	-0.5	141	9	6.9
Mortality (annuity business) -5%	5,080	-45	-0.9	139	7	5.5
No mortality improvements (life business)	5,126	-	-	132	-	-
Morbidity (life business) +5%	5,100	-25	-0.5	137	4	3.4
Required capital						
Minimum solvency capital	5,464	339	6.6	139	7	5.4
Other						
Value of original currencies -10%	5,120	-5	-0.1	132	-	-0.2

Compared to our reinsurance business most of our primary business is characterised by substantial financial options and guarantees but lower non hedgeable risks. Therefore the main drivers are economic assumptions. In contrast non economic assumptions are of less significance.

The asymmetry in interest rate sensitivities reflects the combined impact of interest rate guarantees and policyholder participation, mainly caused by our German primary life business.

The substantial effects of cross-subsidisation between new and in-force participating business (especially in German life and health insurance) are reflected in the approach we used to calculate the VNB sensitivities.

As in previous years we do not apply a liquidity premium in our calculation. To improve comparability with the results of other companies, we calculate a sensitivity that assumes a liquidity premium of 10bp for the whole portfolio. In general the sensitivity of a liquidity premium shows a stronger effect on the MCEV than an interest rate sensitivity of the same amount.

Except for the stressed assumptions the sensitivity calculations are performed in analogy to the base case.

5 Embedded value methodology



The embedded value methodology adopted is in accordance with the Market Consistent Embedded Value Principles® ('MCEV Principles') published by the European Insurance CFO Forum ('CFO Forum') in June 2008. We do not apply any liquidity premiums as permitted by an amendment to the MCEV Principles, published by the CFO Forum in October 2009. In this section we specify the methodology used in preparing this supplementary report.

The embedded value results and IFRS equities are presented at a consolidated Munich Re Group level. Results are presented net of minority interests and policyholders' interests. Intra-Group reinsurance ceded from primary insurers to reinsurers is shown in the reinsurance segment.

The embedded value reporting currency is the euro. Calculations are undertaken in the original currency of the covered business and converted to euros for consolidation purposes. In converting original currency embedded values and their components into euros, the exchange rates as at the relevant valuation dates are used. Changes in the embedded value due to changes in foreign exchange rates are part of opening and closing adjustments. For converting embedded value earnings based on the original currency into euros, average of year exchange rates are used.

5.1 Look-through principle

The assets related to covered business are mainly managed by the Munich Re Group's asset management units. The costs and profits from managing these assets are included in the embedded value on a look-through basis.

Where material, costs of other service companies, such as administration and IT, are also included in the embedded value on a look-through basis. Also costs of holding companies related to covered business have been allowed for in the embedded value calculations.

5.2 Free surplus (FS) and required capital (RC)

The adjusted net worth (ANW) of our covered business is defined as follows:

- // For pure life reinsurance entities ANW equals local regulatory net worth adjusted to reflect the market value of assets.
- // For composite reinsurance entities the allocated required capital is used.
- // For primary insurance entities ANW is based to the local regulatory net worth.

Differences between IFRS and statutory pension liabilities are included in the MCEV as an adjustment to net assets.

The required capital (RC) is defined as follows:

- // For reinsurance entities, RC is derived from a combination of regulatory requirements and internal objectives (e.g. rating requirements, internal economic capital model).
- // For German primary insurers, RC is set to statutory net worth adjusted for differences between IFRS and statutory pension liabilities. With their statutory net worth all German primary insurers covered in this report have statutory solvency ratios well above 150%.
- // For international primary insurers, RC is equal to 100% of the EU minimum solvency requirements. This simplified assumption has little impact on the MCEV.

The free surplus (FS) is defined as the adjusted net worth less the required capital.

5.3 Value of in-force covered business (VIF)

A bottom-up approach to allow for risk is adopted for the calculation of the present value of in-force covered business. The economic assumptions and discount rates used are calibrated applying a market-consistent methodology to allow for financial risk. In principle, each cash flow is valued according to its inherent financial risk.

For business without significant financial options and guarantees, the certainty-equivalent technique is used. Under this valuation approach, the individual cash flows are adjusted to remove the effects of financial risks. The resulting stream of risk-adjusted profits is then discounted at the risk-free rate.

For business with significant financial options and guarantees, a stochastic model using market-consistent scenarios is applied to determine the VIF. The stochastic models allow for interaction of assets and liabilities and include expected management behaviour; e.g. regarding the investment strategy, the management of unrealised capital gains, and the determination of bonus rates for participating business. In addition, dynamic policyholder behaviour with respect to lapses and surrenders has been allowed for.

In some territories where reinsurance business is written, only limited policy data is available. In such cases, projections are made on a portfolio basis to reflect expected profitability ratios and all other relevant information.

The VIF is decomposed into the following items that are exemplified in the sections below:

- // Present value of future profits (PVFP)
- // Time value of financial options and guarantees (TVFOG)
- // Cost of residual non hedgeable risks (CRNHR)
- // Frictional cost of required capital (FCRC).

5.4 Present value of future profits (PVFP)

The PVFP is the present value of future local statutory shareholder after-tax profits emerging from the covered business on the condition that all economic and non economic assumptions are met.

In this respect PVFP already includes the intrinsic value of financial options and guarantees of covered business. The time value of financial options and guarantees arising from the uncertainty of economic assumptions is disclosed separately.

5.5 Time value of financial options and guarantees (TVFOG)

Participating life business is generally characterised by the following key features:

- // A minimum interest rate or a minimum level of bonus is guaranteed to the policyholder. Hence, whenever the investment return on the allocated assets does not exceed the necessary minimum and other means of funding the guarantees are depleted, the shareholder will bear the cost of maintaining the guarantees.
- // Generally, bonuses and crediting rates exceed minimum guaranteed levels. In this case, the amount credited will be based on profit-sharing rules which involve a degree of management discretion.

The participating features are usually a combination of contractual or legal constraints, and management discretion based on competitive pressure or market practice. The participating business has been modelled to reflect both contractual and regulatory constraints as well as internal management rules. Projected surrender rates depend dynamically on the difference between the risk-free interest rate and the credited rate.

In our market-consistent calculation we allow for the potential impact on future shareholder cash flows of all financial options and guarantees within the in-force covered business. This allowance is based on stochastic techniques using methods and assumptions consistent with the underlying embedded value. All projected cash flows are valued using economic assumptions in line with the price of similar cash flows that are traded in the capital markets.

Stochastic models are used for all significant primary life and health insurance business. The time value of financial options and guarantees is determined as the difference between the average present value over all stochastic scenarios and the present value for the certainty equivalent scenario. The stochastic model is run using 1,000 scenarios based on an econometric model and takes the following explicitly into account:

- // Management discretion concerning bonus policy and profit-sharing rules
- // Timing of realisation of unrealised capital gains
- // Dynamic asset allocation, in particular management of the equity-backing ratio
- // Dynamic adjustment of technical interest rates for German primary health business
- // Surrender rates dependent on the capital markets

It is predominantly primary life business that is exposed to financial options and guarantees. The following aspects of financial options and guarantees are of particular relevance:

- // All policyholder options (such as full or partial surrender, premium discontinuance and annuitisation) combined with policyholder guarantees (like interest rate guarantees, guaranteed surrender values or guaranteed annuity rates) have a large influence on the VIF.
- // On the other hand companies are able to substantially influence the value of financial options and guarantees, for example by changing their bonus policy for participating life business or by adjusting the long-term asset allocation. Such management discretion is subject to any contractual guarantees and regulatory or legal constraints.

The TVFOG published in this and other documents of Munich Re reports the net effect.

Our life reinsurance portfolio has only a very limited exposure to financial options and guarantees.

5.5.1 TVFOG in German primary life business

In German primary life business by far the biggest share of the time value of financial options and guarantees results from the guaranteed interest rate together with legal restrictions for the minimum policyholder participation.

The maximum actuarial interest rate in life insurance (commonly referred to as the “guaranteed interest rate”) is laid down in the German federal ordinance concerning actuarial assumptions for future policy benefits (“Deckungsrückstellungsverordnung”).

The German federal ordinance relating to minimum policyholder participation in life insurance (“Mindestzuführungsverordnung”) effective from 4 April 2008 applies rules concerning customers’ minimum participation in statutory profits that strongly restrict loss offset from the different profit sources (investment result, mortality result, remaining result).

5.5.2 TVFOG in German primary health business

For participating German primary health business, minimum profit-sharing rules are set according to current legal requirements. Management discretion is relevant for the use of free policyholder funds in order to reduce future premium increases necessary to cover the assumed development of healthcare costs. Furthermore, management decisions on how to proceed with changes in technical interest rates are taken into account, subject to legal restrictions.

As detailed analyses show, German primary health business is not exposed to financial options and guarantees since policyholder options are counterbalanced by options of the company. The main reasons are:

- // Technical interest rates are not guaranteed for the whole contract term, but can be changed through a premium adjustment process. In the event of an interest rate reduction, this leads to higher premium rates for the policyholder.
- // If future investment returns are expected to be below the guaranteed interest rate, the German Federal Financial Supervisory Authority (BaFin) demands in accordance with the “Aktuarielle Unternehmenszins-Verfahren (AUZ-Verfahren)” a reduction in the interest-rate guarantee which corresponds to premium rate increases.

5.6 Cost of residual non hedgeable risks (CRNHR)

The cost of residual non hedgeable risks reflects the impact of risks not already allowed for in the TVFOG or the PVFP. For determining the CRNHR we use a cost of capital approach.

For all businesses the amount of economic risk capital for non hedgeable risks (ERCNHR) is determined by our internal economic capital model and projected over the run-off of the business. In anticipation of future amendments to the MCEV Principles we already include the diversification between our covered and non-covered business to reflect our integrated risk management process. Diversification between hedgeable and non hedgeable risk is disregarded. The associated capital for insurance and operational risks of €1.4bn for reinsurance and €0.3bn for primary insurance are allocated from the total associated capital to non hedgeable risks within Munich Re. The capital is calibrated to a level of VaR(99.5%). The cost rate applied to the ERCNHR is 7%. CRNHR is the present value of future ERCNHR of covered business times the cost rate.

5.7 Frictional cost of required capital (FCRC)

The cost of holding capital is caused by taxes on profits of assets backing required capital as well as by the cost of their management. For our German primary health business investment income on shareholder funds is subject to policyholder participation and thus also included in the FCRC.

Please note that in our EEV framework of former years frictional cost represented the allowance for non hedgeable risks.

5.8 Change in embedded value

The change in embedded value from one valuation date to the next comprises the following elements:

- // Opening adjustments
- // Embedded value earnings
- // Closing adjustments

The value of acquired or divested business, including the change in stakes of Munich Re in companies covered in this report as well as the change in scope are shown as **opening adjustments**. Also the impact of changes in currency exchange rates from the end of last year to the average of the reporting year is included.

Embedded value earnings are stated at average currency exchange rates and at average share of Munich Re in the respective companies. They are explained in more detail in the following section.

Closing adjustments contain changes in currency exchange rates from the average of year to the end of the reporting year and any capital movements, especially dividends.

5.9 Embedded value earnings

The embedded value earnings can be split into the following components:

- // Value of new business
- // Expected return at reference rate
- // Expected return in excess of reference rate
- // Transfer from VIF and required capital to free surplus
- // Experience variances
- // Assumption changes
- // Other operating variance
- // Economic variances
- // Other non operating variance

The sum of the first seven components of embedded value earnings are referred to as operating embedded value earnings.

The value of new business is explained in the following section.

The **expected return at reference rate** ('Expected existing business contribution (reference rate)' according to MCEV Principles) is calculated assuming a risk-free roll-forward of the embedded value at the beginning of the year.

The **expected return above reference rate** ('Expected existing business contribution (in excess of reference rate)' according to MCEV Principles) reflects management's expectation for asset returns above the reference rate.

Where the prospect of earning risk premiums is part of the business model we assume the following excess returns above reference rate:

- // For equities we assume a risk premium of 400bp.
- // For real estate we assume a risk premium of 300bp.
- // For all other assets no risk premium is assumed.

The expected return in excess of reference rate is the net effect of these excess returns on embedded value earnings.

The **experience variances** summarise the prospective and retrospective outcome of differences between the actual operating experience in the reporting year and the operating result assumed in the previous embedded value calculation.

Assumption changes represent the aggregate impact on the embedded value of changes in the operating assumptions within the reporting year. All operating assumptions are subject to an active review at each valuation date.

Other operating variance comprise model changes or model refinements as well as the effect of tax planning action.

The **economic variances** describe the aggregate impact on the embedded value of changes in economic assumptions (including reference rate and implied volatilities) during the reporting year and in the projections years. They are the net effect of a change of economic parameters on the assets and liabilities.

Other non operating variance summarises the impact of changes in the regulatory framework such as taxation or legislation concerning policyholder participation.

5.10 Value of new business (VNB)

VNB is the present value as at the end of the reporting year of the future local statutory after-tax profits in respect of new business written in the reporting year; reduced by the time value of financial options and guarantees, cost of residual non hedgeable risks and frictional costs associated with new business. Additionally, after-tax regulatory profits in respect of this business during the reporting year are included in the reported VNB. The calculation is consistent with the methodology outlined for the value of in-force business.

For reinsurance business, the value of new business can be calculated on a stand-alone basis, as there are no material interactions between in-force and new business. For primary insurance business, because of material interactions between existing and new business, a marginal approach is used.

5.11 Operating assumptions

Operating assumptions describe expected future operating experience. They refer mainly to mortality, morbidity, persistency, expenses and in primary insurance business to policyholder participation. The operating assumptions are based on best estimate assumptions derived from company experience and/or market experience. They are in line with management expectations and reflect recent operating experience of the entities concerned.

All costs related to covered business are split into acquisition, maintenance and investment-related expenses and are fully allowed for in the embedded value. There are no expenses excluded as development costs. We use a going concern approach in line with the MCEV Principles. Future productivity gains are not anticipated in the embedded value calculations beyond what has been achieved.

5.12 Tax assumptions

Taxation assumptions included in the embedded value models reflect local taxation rates and bases, including future changes that are at an advanced stage of legislative implementation. Tax modelling also includes the valuation of existing tax losses carried forward. No withholding taxes on dividends from subsidiaries have been allowed for.

Additionally from this reporting year on we also model within covered business the newly established tax grouping of ERGO.

5.13 Economic assumptions

The economic assumptions are derived following a market-consistent valuation approach. Many asset classes and economic assumptions are modelled stochastically. These include equities and property returns, bond yields, interest rates and inflation.

The construction of risk-neutral economic scenarios requires careful calibration to the underlying market parameters to ensure that the valuation replicates the market prices of assets. The key areas for calibration are initial yield curves, implied market-consistent volatilities of all relevant asset classes and correlations between asset classes. The interest-rate model used considers both parallel shifts and twists to the yield curve.

The economic scenarios have been calibrated to the market conditions at the valuation dates, i.e. risk-free rates, swaption prices and equity option prices. Generally, Swap rates have been used as an approximation of the risk-free yield curves. In countries without deep and liquid swap markets, government bonds were used instead. The parameters used for year-end 2008 and year-end 2009 are shown in Section 6.4. In 2009 we switched to a Libor Market Model. Minor impacts from this model improvement are not disclosed separately.

The economic scenarios are mostly constructed using a proprietary economic scenario generator developed by Barrie & Hibbert, a financial risk consultancy based in Edinburgh. The Barrie & Hibbert economic scenario generator is widely used in the insurance industry.

5.14 Reinsurance business

Our reinsurance business is characterised by biometric risks. Therefore the influence of economic assumptions is limited. New business is defined as that arising from the sale of new contracts by our customers during the reporting period. Due to the nature of life reinsurance, the value of new business includes the value of expected renewals on those new contracts and expected future contractual alterations to those new contracts. New business comprises:

- // For individual business, new cessions in the year on either new or existing treaties.
- // For group business, new group schemes on either new or existing treaties, and also new members to existing group schemes.
- // For annually renewable reinsurance contracts (e.g. stop-loss and other non-proportional reinsurance business), new treaties and renewals of existing treaties.

Reinsurance companies and major branches writing covered reinsurance life business are listed in the following table:

Covered reinsurance business

Reinsurance companies writing covered life reinsurance business

Munich Reinsurance Company of Australasia Ltd, Sydney
Münchener Rück do Brasil Resseguradora S.A., Sao Paulo
Münchener Rückversicherungs-Gesellschaft AG, München
Munich Reinsurance Company Life Reinsurance Eastern Europe/Central Asia, Moskau
Munich Reinsurance Company of Africa Ltd, Johannesburg
Neue Rückversicherungs-Gesellschaft, Genf
Munich American Reassurance Company, Atlanta, Georgia

Major branch offices writing life reinsurance business

Munich Reinsurance Company Canada Branch (Life), Toronto
Munich Reinsurance Company United Kingdom Life Branch, London

5.15 German primary life business

For primary insurance, new business is defined as business arising from the sale of new contracts during the reporting period. The value of new business includes the value of expected renewals on those new contracts and expected future contractual alterations to those new contracts. For German primary life business, new business includes the current year's increments on existing policies.

It is assumed that in case of severe financial distress approval from the regulator is granted to restrict policyholder participation and to cover policyholder guarantees by the free RfB and the Terminal Bonus Fund. The changed ordinance to calculate the Terminal Bonus Fund is not implemented yet in the models.

Effects from the new ERGO branding strategy are not reflected in the calculations as at 31 December 2009.

The following German primary life companies are covered, the last two companies for the first time:

Covered German primary life business

Hamburg-Mannheimer Versicherungs-Aktiengesellschaft, Hamburg
VICTORIA Lebensversicherung Aktiengesellschaft, Düsseldorf
KarstadtQuelle Lebensversicherung AG, Fürth
Vorsorge Lebensversicherung Aktiengesellschaft, Düsseldorf
Vorsorge Luxemburg Lebensversicherung S.A., Munsbach

5.16 German primary health business

In addition to tax and investment cost of required capital, policyholder participation in the profit of the required capital is included in the FCRC for our German primary health business.

The development of healthcare costs is based on general inflation assumptions adjusted for higher health inflation in some parts of the business. Premium rates are assumed to increase in line with these developments.

Effects from the new ERGO branding strategy are not reflected in the calculations as at 31 December 2009.

The following German primary health companies are covered:

Covered German primary health business

DKV Deutsche Krankenversicherung Aktiengesellschaft, Köln

VICTORIA Krankenversicherung Aktiengesellschaft, Düsseldorf

5.17 International primary life business

Our covered International primary life business comprises the following companies:

Covered International primary life business

ERGO Previdenza S.p.A., Mailand

ERGO Elukindlustuse AS, Tallinn

Sopockie Towarzystwo Ubezpieczen na Zycie Ergo Hestia Spolka Akcyjna, Sopot

ERGO Latvija Lebensversicherung AG (ERGO Latvija Dziviba AAS), Riga

ERGO Lietuva gyvybes draudimas, Vilnius

ERGO Vida Seguros y Reaseguros, Sociedad Anónima, Saragossa

ERGO Life N.V., Brussels

VICTORIA-Seguros de Vida, S.A., Lissabon

VICTORIA-VOLKSBANKEN Versicherungsaktiengesellschaft, Wien

Bank Austria Creditanstalt Versicherung AG, Wien

6 Assumptions



6.1 Shareholders' share

Shareholders' share	Primary insurance	
	31.12.09	31.12.08
%		
Germany - life	14	15
Germany - health	15	15
Italy	18-20	18-20

The shareholders' shares used in the projections represent strategic long-term planning assumptions that are subject to management discretion in the projection.

6.2 Tax rates

Long-term tax rate	Reinsurance		Primary insurance	
	31.12.09	31.12.08	31.12.09	31.12.08
%				
Germany	33	33	32	32
Italy	32	32	33	33
US	35	35		
Canada	26	28		
UK	28	28		

Tax grouping of ERGO was established in 2009 and is modelled within covered business.

6.3 Currency exchange rates

Currency exchange rates	31.12.2009	2009	31.12.2008
		average year	
€1 = ... foreign currency			
USD	1.43290	1.40688	1.39005
CAD	1.50710	1.59405	1.71600
GBP	0.88600	0.89418	0.96685

6.4 Economic assumptions

6.4.1 Risk-free interest rates

Generally, Swap rates have been used as an approximation of the risk-free yield curves. In countries without deep and liquid swap markets, government bonds were used instead.

The table below shows the swap yield curves at the relevant valuation date for the major currencies.

Swap yield curves	31.12.2009				31.12.2008			
	EUR	USD	GBP	CAD	EUR	USD	GBP	CAD
Term								
1 year	1.31	0.66	1.00	0.81	2.55	1.29	2.00	0.96
2 years	1.88	1.43	1.99	1.57	2.76	1.45	2.60	1.07
3 years	2.29	2.07	2.65	2.13	2.96	1.71	2.85	1.32
4 years	2.57	2.58	3.09	2.55	3.12	1.96	3.02	1.49
5 years	2.81	2.98	3.39	2.87	3.24	2.16	3.15	1.61
6 years	3.03	3.29	3.61	3.12	3.36	2.27	3.24	1.75
7 years	3.21	3.52	3.77	3.33	3.46	2.36	3.31	1.91
8 years	3.36	3.70	3.90	3.52	3.57	2.43	3.37	2.09
9 years	3.48	3.85	4.00	3.69	3.66	2.50	3.41	2.29
10 years	3.59	3.97	4.09	3.85	3.74	2.57	3.45	2.49
15 years	3.96	4.36	4.37	4.40	3.90	2.81	3.67	3.18
20 years	4.06	4.47	4.36	4.54	3.86	2.79	3.58	3.38
25 years	4.02	4.51	4.29	4.44	3.67	2.71	3.43	3.36
30 years	3.94	4.53	4.22	4.37	3.54	2.72	3.32	3.32

For interpolation a regression spline technique is used and extrapolation is done by the Nelson-Siegel form.

6.4.2 Volatilities

The interest rate scenarios have been generated so that they replicate at-the-money swaption prices with a swap tenor of 20 years. The implied volatilities for these swaptions are outlined in the following table:

Target swaption implied volatilities	31.12.2009		31.12.2008	
	Euro	USD	Euro	USD
Term				
%				
1 year	21.00	25.90	36.40	48.70
2 years	20.50	24.70	31.10	41.50
3 years	19.00	23.20	28.50	37.80
4 years	18.20	21.90	26.60	35.00
5 years	17.40	20.60	25.30	32.80
10 years	15.60	16.30	24.00	25.50
15 years	16.20	14.30	26.80	24.50
20 years	17.40	12.80	28.50	22.70
30 years	16.50	12.50	25.00	21.60

The equity models have been calibrated to prices of at-the-money ten-year European equity index options observed in the OTC market. The implied volatilities of these option prices are shown in the table below.

Target equity implied volatilities	31.12.2009		31.12.2008	
	EURO STOXX	S&P 500	EURO STOXX	S&P 500
Equity index				
%	28.60	29.00	34.30	35.20

Given the long-term nature of the financial risks embedded in life insurance contracts, the implied volatilities of swaptions and equity options of the longest available maturities have been taken as target volatilities.

6.4.3 Correlation coefficients

Correlation assumptions are estimated from historic market data. The relevant correlation assumptions between the change of one-year bond yields and equity returns are displayed in the table below.

Correlation coefficients	One-year EUR bond yield	EURO STOXX
	One-year EUR bond yield	1.000
EURO STOXX		1.000
	One-year USD bond yield	S&P 500
One-year USD bond yield	1.000	-0.220
S&P 500		1.000

7 Independent assurance report



Introduction

Based on the engagement letter dated 22 September 2009 KPMG has been engaged to audit the Market Consistent Embedded Value (MCEV) of Münchener Rückversicherungs-Gesellschaft Aktiengesellschaft, München, (Munich Re) as at 31 December 2009 as stipulated in the accompanying MCEV Report of Munich Re. Munich Re is responsible for the preparation of the MCEV Report including the calculation of the MCEV. This includes particularly setting the operative and economic assumptions, the explanation concerning the determination of the MCEV and its roll forward, the implementation and the operativeness of the system which ensures the completeness and correctness of the data which are necessary for the calculation of the MCEV. Our responsibility is to express an opinion on the calculation of the MCEV as to whether the methodology and the assumptions used comply with the Market Consistent Embedded Value Principles[®] as published by the CFO Forum on 4 June 2008 and amended in October 2009 (Market Consistent Embedded Value Principles) except principles 17.3.37 to 17.3.45 (Group MCEV). Munich Re does not apply a liquidity premium in the calculation of the MCEV but discloses an additional sensitivity which allows to understand and to assess the impact of a liquidity premium on the MCEV.

Subject matter and Criteria

For the calculation of the MCEV Munich Re applies criteria as set out in the Market Consistent Embedded Value Principles except principles 17.3.37 to 17.3.45. The calculation of Market Consistent Embedded Values is necessarily based on numerous assumptions with respect to economic conditions, operating conditions, taxes, and other matters. Many of these are beyond of the Companies control. Actual cash flows in the future are likely to be different from those assumed in the calculation and such variation may be material.

Work performed

We conducted our audit of the MCEV in accordance with the International Standard on Assurance Engagements (3000): "Assurance engagements other than audits or reviews of historical financial information", issued by the International Auditing and Assurance Standards Board. The effectiveness of the accounting-related internal control system in the MCEV calculation is examined primarily on a test basis within the framework of the audit. The audit includes assessing the MCEV principles used and significant estimates and assumptions made by management. As a result of determining our audit strategy and audit objectives we have established Market Consistent Embedded Value Principles 3, 6, 7, 9, 11, 12, 13, 14, 15 and 16 as the special focus of our audit.

We believe that our audit provides a reasonable basis for our opinion.

Regarding our independence we comply with the requirements of the IFAC Code of Ethics for Professional Accountants.

Conclusion

In our opinion the methodology and the assumptions used comply with the Market Consistent Embedded Value Principles except principles 17.3.37 to 17.3.45 (Group MCEV). Munich Re does not apply a liquidity premium in the calculation of the MCEV but discloses an additional sensitivity which allows to understand and to assess the impact of a liquidity premium on the MCEV of Munich Re. In particular:

- // The calculated MCEV 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. Section 5 sets out the methodology of making allowance for the aggregate risks. In particular by the use of
 - a level of required capital derived from internal risk models and additional regulatory restrictions
 - a market-consistent assessment of the time value of financial options and guarantees, and
 - a deduction for frictional cost of required capital based on the cost of double taxation, investment expenses and, where applicable, policyholder participation on the required capital
 - a deduction for the cost of residual 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
- // For the primary participating business, the assumed bonus distribution, asset allocation, allocation of profit between policyholders and shareholders, and other management actions are consistent with other assumptions used in the projections, and with local market practice
- // We have also performed limited high-level checks on the results of the calculations. We have not, however, performed detailed checks on all the models and processes involved

We have provided the services described above on behalf of Münchener Rückversicherungs-Gesellschaft Aktiengesellschaft, München. We have carried out our engagement on the basis of the General Engagement Terms included in our engagement agreement dated as of January 1, 2002. By taking note of and using the information as contained in our Assurance Report each recipient confirms to have taken note of the terms and conditions stipulated in the aforementioned General Engagement Terms (including the liability limitations to € 4 Mio. for negligence specified in item No. 9 included therein) and acknowledges their validity in relation to us.

Cologne, 8 March 2010

KPMG Bayerische Treuhandgesellschaft Aktiengesellschaft
Wirtschaftsprüfungsgesellschaft



Hanno Reich
Partner



Frederik Boetius
Partner

8 Disclaimer



This report contains forward-looking statements that are based on current assumptions and forecasts of the management of the Munich Re. Known and unknown risks, uncertainties and other factors could lead to material differences between the forward-looking statements given here and the actual development; in particular the results, financial situation and performance of our company. Munich Re assumes no liability to update these forward-looking statements or to conform them to future events or developments.

9 Glossary and abbreviations



Aa

Acquired (divested) business //

Business acquired (divested) through acquisition (sale) of stakes in insurance or reinsurance companies

Adjusted net worth (ANW) //

Also known as shareholders' net worth or adjusted net asset value. MCEV Principles distinguish between free surplus and required capital.

Assumption changes //

Aggregate impact of changes in the operating assumptions on the embedded value.

Bb

Best estimate assumption //

An assumption that represents the expected outcome from the range of possible outcomes of future experience

Cc

Capital movements //

Dividends and capital contributions

Costs of residual non hedgeable risks (CRNHR) //

Allowance for risks not already included in the PVFP or TVFOG. Munich Re uses a cost of capital approach with a unique cost rate applied to the projected risk capital for non hedgeable risks.

Covered business //

The business for which the embedded value is reported

Currency movements //

Aggregate impact of currency movements on the embedded value

Ee

Economic assumptions //

These include risk-free interest rates, discount rates, inflation rates and assumptions on the volatility of economic parameters

Economic variances //

Are the sum of the difference between projected and actual investment return in the reporting year and effects on the embedded value from changes in capital market parameters

Embedded value //

Present value of shareholders' interests in the earnings distributable from assets allocated to covered business after sufficient allowance for the aggregate risks in covered business

European Embedded Value (EEV) //

Embedded value according to the European Insurance CFO Forum European Embedded Value Principles ('EEV Principles'). Published in May 2004, available online at <http://www.cfoforum.nl>.

Expected return at reference rate //

Return for the reporting year if all assumptions of the previous year would remain constant. Besides the risk-free roll-forward of the embedded value at the beginning of the year it also reflects the unwind of frictional costs, costs for non hedgeable risks and the decay of the time value of financial options and guarantees.

Expected return in excess of reference rate //

Additional return expected by the management due to assumed risk premiums for certain asset classes.

Experience variances //

The impact on the embedded value of differences between the actual operating experience in the reporting year and the operating result assumed in the previous embedded value calculation

Ff

Free surplus (FS) //

Amount of capital allocated to the business in excess of the required capital

Frictional costs of required capital (FCRC) //

Allowance for taxation and investment costs on the assets backing required capital. Additionally, for German primary health business FCRC includes the cost of profit sharing of investment income on assets backing required capital.

Ii

IFRS //

International Financial Reporting Standard

LI

Look-through basis //

A basis via which the impact of an item on the whole Munich Re Group is measured, rather than on a particular part

Mm

Market Consistent Embedded Value (MCEV) //

Embedded value according to the European Insurance CFO Forum Market Consistent Embedded Value Principles ('MCEV Principles'), Copyright Stichting CFO Forum Foundation 2008. Published in June 2008, available online at <http://www.cfoforum.nl>. Currently we don't make use of any liquidity premiums according to the amendment to the MCEV Principles, published by the CFO Forum in October 2009.

Oo

Opening/closing adjustments //

Change in embedded value due to capital movements, foreign exchange variance or acquired/divested business

Operating assumptions //

All assumptions relating to demographic assumptions (e. g. mortality, morbidity), expenses, policyholder participation and policyholder behaviour.

Operating MCEV earnings //

The sum of expected return, value of new business, experience variances, assumption changes and other operating variance.

Other operating variance //

Effects from a change or improvement in models and tax planning action

Other non operating variance //

Impacts of legal or regulatory changes including taxation

Pp

Participating business //

Primary insurance business in which policyholders have the right to participate in the performance of a specified pool of assets or contracts

Present value of future profits (PVFP) //

The value of future profits from the in-force covered business and the assets backing the associated liabilities; net of tax, policyholder participation and minorities.

Present value of new business premiums (PVNBP) //

Present value of future premiums from new business

Rr

Required capital (RC) //

The amount of surplus assets whose distribution to shareholders is restricted

RfB //

The "Rückstellung für Beitragsrückerstattung (RfB)" is the provision for premium refunds in German primary insurance

Risk-free (interest) rates //

Prospective yields on securities considered to be free of default and credit risk

Ss

Statutory basis //

Valuation basis used for reporting financial statements to local regulators

Tt

Time value of financial options and guarantees (TVFOG) //

The time value of financial options and guarantees is part of the VIF; the VIF before deduction of the allowance for the time value of financial options and guarantees reflects their intrinsic value

Vv

Value of in-force business (VIF) //

The value of in-force covered business is the present value of future shareholder cash flows (PVFP) reduced by costs of residual non hedgeable risks (CRNHR), the frictional costs of required capital (FCRC) and the time value of financial options and guarantees (TVFOG)

Value of new business (VNB) //

The value added through the activity of writing new business

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