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# 2014 Embedded Value Results - Europe

## Generating Value





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## TABLE OF CONTENTS

EXECUTIVE SUMMARY	2
INTRODUCTION	4
EMBEDDED VALUE OVERVIEW	6
EMBEDDED VALUE RESULTS	8
Embedded Value	8
Value of New Business	9
METHODOLOGY HOT TOPICS	11
Risk Discount Rate	11
Yield Curve Extrapolation	15
Cost of Capital	15
Cost of Residual Non-Hedgeable Risks	16
Time Value of Options and Guarantees	18
DISCLOSURES	21
OTHER MEASURES OF VALUE	22
Market Capitalisation	22
Solvency II	23
IFRS Developments	24

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## EXECUTIVE SUMMARY

### Background

- Developed economies saw another year of challenging economic conditions in 2014. Interest rates resumed a downward trend across many economies at the start of 2014, which was accompanied by poor growth in equity markets.
- In April 2014, the European Insurance and Occupational Pensions Authority (EIOPA) published Technical Specifications for the Preparatory Phase (TSPP) for Solvency II, which provided firms with a much clearer picture of the final reporting requirements. In October 2014, EIOPA adopted the Delegated Acts, which contained the implementing rules for Solvency II. However, there has yet to be guidance or commentary from the European Insurance Chief Financial Officers Forum (CFO Forum) on the latest developments in Solvency II or what they may mean for the future of embedded value reporting.
- Based on our review of 32 companies, around 40% continue to use the European Embedded Value Principles (EEV Principles) rather than the European Insurance CFO Forum Market Consistent Embedded Value Principles (the MCEV Principles<sup>1</sup>). However, there is still a trend toward reporting on a market-consistent basis such that over 95% now use some form of market-consistent valuation in their embedded value reporting, based on our sample of companies. One company changed its approach and used Solvency II processes for its embedded value calculations in 2014.

### Embedded Value Results

- The current CFO Forum members (that disclosed their embedded values) reported a combined embedded value (EV) of £259 billion (€333 billion<sup>2</sup>) at the end of 2014 compared with £250 billion (€301 billion<sup>3</sup>) at the end of 2013. The majority of companies included in this study experienced an increase, of varying degrees, in their group embedded values compared with 2013. Four companies saw a decrease in the group embedded values.
- Of the current CFO Forum members, Allianz, AXA, and Prudential reported the three largest group embedded values. The top performers (by percentage increase) were Prudential, Hannover Re, and Mapfre.

### New Business Results

- The value of new business remained largely level in 2014 compared with 2013, with the current CFO Forum members<sup>4</sup> reporting a total value of new business of £11.4 billion (€14.7 billion) in 2014 compared with £11.9 billion (€14.3 billion) in 2013. Overall we saw a small decrease in new business margins and a comforting 12.3% increase in volumes.

### Embedded Value Methodology Hot Topics

- The framework used by companies in 2013 has generally remained static, with the overwhelming majority of companies (some 95%) applying some form of market-consistent valuation. Achmea now uses Solvency II processes for its embedded value.
- Three key areas in embedded value methodology retain their place on the podium of hot topics. They are: (1) the construction of the risk discount rate, especially the extrapolation methodology used; (2) the allowance for cost of capital, including the cost of residual non-hedgeable risks; and (3) recognising the time value of options and guarantees.

### Construction of the Risk Discount Rate

- All companies included in our study use a bottom-up approach to determine the risk discount rate, with the exception of Legal & General and Delta Lloyd, which use a top-down approach.
- Around three-quarters of companies use only swaps as the underlying basis for the risk-free yield curve, with the remainder using government bonds. There are a number of companies that use government bonds for business based in countries without a deep and liquid swap market.
- A handful of companies make a small adjustment to the risk-free rate for credit risk based on London Interbank Offered Rate (LIBOR) swaps.
- The Solvency II framework has been finalised, and companies started looking into aligning their embedded value methodologies with Solvency II. Five companies use the volatility adjustment to their discount rates, Allianz uses the matching adjustment for its pension business in Spain.

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1 Copyright © Stichting CFO Forum Foundation 2008.

2 Sterling to Euro exchange rate as at 31 December 2014.

3 Sterling to Euro exchange rate as at 31 December 2013.

4 Excluding Lloyds TSB as it did not disclose 2014 value of new business.

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- At year-end 2014, liquidity premiums applied remained generally within the region of 20 to 100 bps. No reinsurers included in our study applied a liquidity premium.
  - Sensitivities to the liquidity premium were, again, generally reported as a 10 bps addition to the liquidity premium or the removal of the liquidity premium, where applied. Some companies that made no allowance for the additional return expected in respect of liquidity exposure in their base disclosures showed sensitivities to the inclusion of a range of liquidity premia.
  - Around two-thirds of the companies disclosed that they were using extrapolation techniques. Of those disclosing their extrapolation methodologies, the Solvency II approach again was most prevalent, with most of the companies aligning their parameters with the final Solvency II guidelines.

#### **Cost of Capital/ Cost of Residual Non-Hedgeable Risks**

- MCEV companies that disclosed their equivalent cost-of-capital charges for residual non-hedgeable risks mostly kept the charge at the same level as at the end of 2013. One company reduced the charge from 3.9% at the end of 2013 to 3.2% at the end of 2014.

#### **Time Value of Options and Guarantees**

- In general, market-consistent approaches were used to value options and guarantees. In addition, implied volatilities for interest rates and equities were based on year-end data; companies generally used at least 1,000 economic scenarios in their stochastic models.
- Many companies disclosed allowances for dynamic policyholder behaviour in certain economic scenarios. The same companies disclosed modelling of dynamic policyholder behaviour at the end of 2014 as at the end of 2013.

#### **Disclosures**

- Whilst convergence continues, differences in the interpretation and application of the EEV Principles and the MCEV Principles by companies remain. This may continue to present challenges for investors and analysts alike in carrying out direct comparisons. Embedded value results nevertheless continue to provide useful insights in terms of emerging trends, current position, and future developments regarding profitability, sustainability of capital sources, and creditworthiness.

#### **Other Measures of Value**

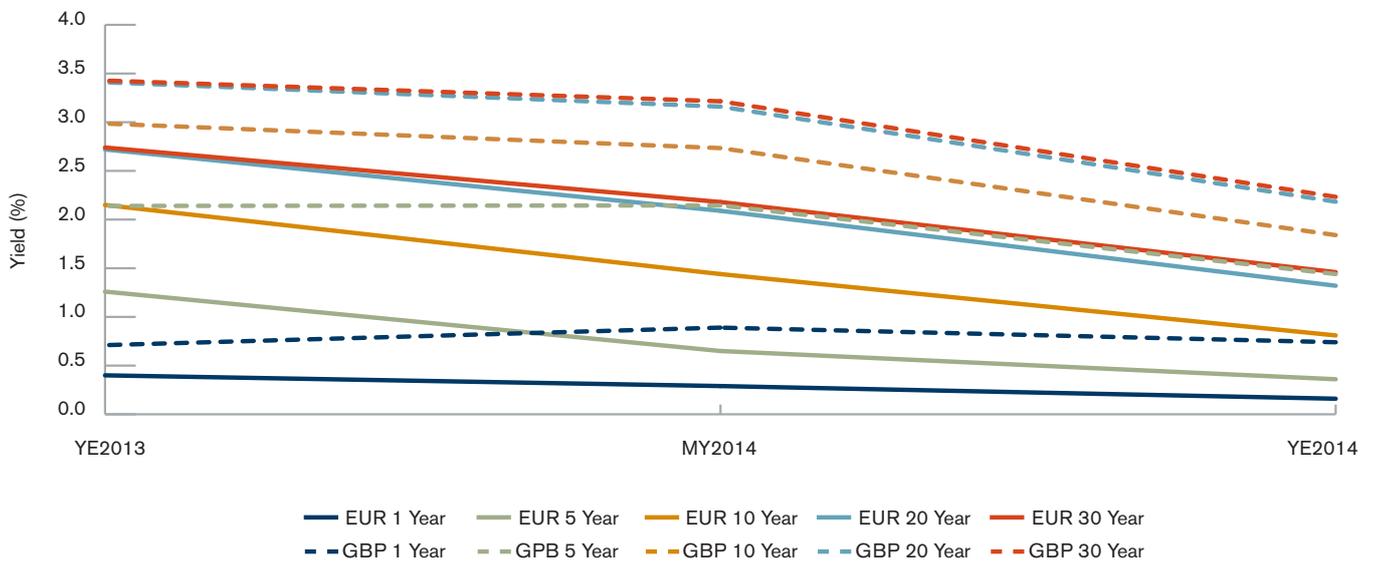
- Insurance companies' market capitalisations have generally become closer to their embedded values, with market capitalisation being 100% of embedded value on average at the end of 2014 compared with 110% at the end of 2013.
- The year 2014 was a key one for financial and solvency reporting, with finalisation of Solvency II and further developments in International Financial Reporting Standards (IFRS). With Solvency II coming into force from 1 January 2016, companies are likely to face a number of challenging years in terms of adapting to new reporting requirements.
- Given the different intended purposes of embedded value and Solvency II reporting, it remains to be seen whether convergence will occur in practice. Companies may continue to align their embedded value methodologies with Solvency II. On the other hand, the existence of features of Solvency II that are not market consistent, such as the volatility adjustment (VA), matching adjustment (MA), and transitional measures which will last for 16 years, might distort Solvency II results. In addition, the potentially restricting nature of contract boundaries in recognizing future premiums may further promote the importance of embedded value reporting.

## INTRODUCTION

Following a positive year in 2013, 2014 saw a return to difficult financial conditions. Interest rates resumed a downward trend across many economies at the start of 2014 (see Figure 1), which was accompanied by poor growth in equity markets (see Figure 2), with many market indices showing negative growth over the year.

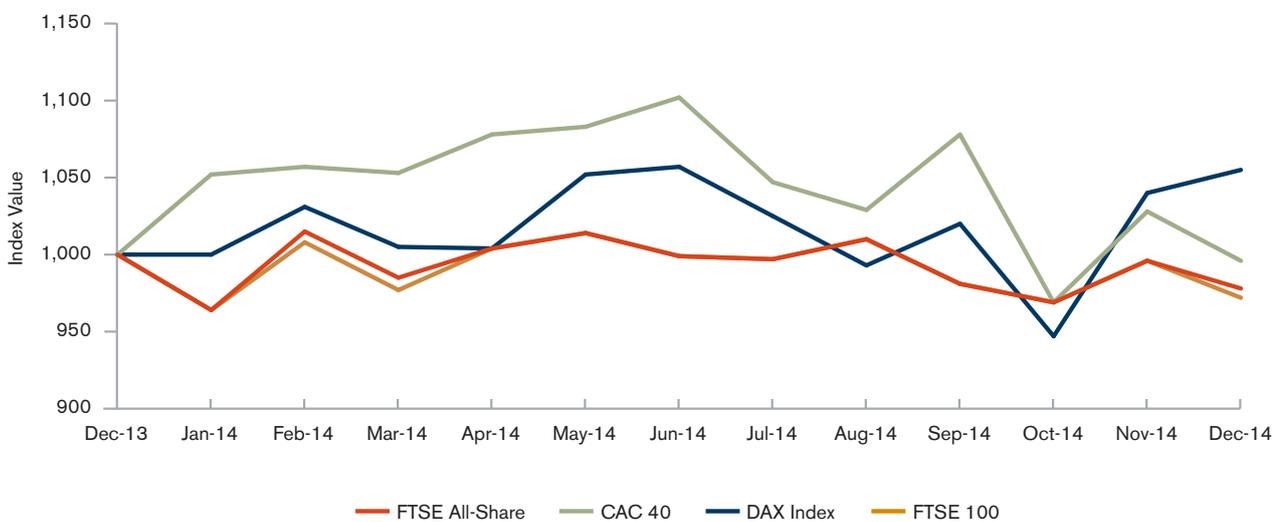
The low interest rates coupled with high interest rate volatility negatively affected the insurance industry, with many companies reporting negative economic variances. However, for many companies, negative economic impact was offset by positive operational variances, stemming from product design initiatives and favourable non-economic experience (whilst not a general trend, a number of companies reported improved persistency experience).

**FIGURE 1: RECENT TRENDS IN GBP AND EUR SWAP RATES**



Source: Bloomberg

**FIGURE 2: RECENT EQUITY MARKET PERFORMANCE**



Source: Bloomberg

Indices above are the gross total return indices and have been rebased to 1,000 as at 31 December 2013.

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Markets were less buoyant in 2014, reflecting the challenging economic conditions. The comparison between market capitalisation and embedded value worsened, with the average market capitalisation as a percentage of total embedded value decreasing from 110% at the end of 2013 to 100% at the end of 2014. Growth remained low in 2014 and there is much uncertainty about the stability of the positive trend in growth seen in some markets in late 2014 and early 2015.

In April 2014, European Insurance and Occupational Pensions Authority (EIOPA) published a set of Technical Specifications for the Preparatory Phase (TSPP) for Solvency II, which provided firms with a much clearer picture of the final reporting requirements. In October 2014 EIOPA adopted the Delegated Acts, which contained the implementing rules for Solvency II. Following this a number of firms have begun to align their Embedded Value (EV) methodologies with Solvency II. This is particularly noted in the reference rates used, where some firms have transitioned to the Solvency II yield curves, or have adopted the volatility or matching adjustments. Firms were also seen to adopt the yield curve extrapolation and convergence methodology specified within the TSPP and Delegated Acts.

The Chief Financial Officers Forum (CFO Forum) Forum has not, at the time of writing, issued any further guidance as to allowances that should be made for Solvency II in embedded value disclosures. The most recent transitional guidance issued in September 2012 stated that, until such time as all relevant standards, guidance, and the effective date are finalised, there would be no requirement to make allowance for the developing Solvency II regime when applying the European Insurance CFO Forum Market Consistent Embedded Value Principles (MCEV Principles) or the European Embedded Value Principles (EEV Principles). To encourage consistency in methodology and to allow comparison of disclosures, we believe there will be increased need for the CFO Forum to provide guidance leading up to the implementation of Solvency II and beyond. Without clear guidance the scope for divergence increases.

Other regulatory changes, such as International Financial Reporting Standards (IFRS) 4 Phase II for insurance contracts reporting, are on the horizon for insurers, with a revised exposure draft issued in June 2013. The International Accounting Standards Board (IASB) has already made tentative decisions on some of the areas consulted upon, but there are a number of items requiring further discussion by the IASB before publication of the final standard, which will not occur before the end of 2015. Currently, the IASB does not expect the insurance contract standard to be effective until January 2018, the mandatory effective date of IFRS9.

In this publication, we focus on embedded value results as at year-end 2014. In addition to providing an overview of the methodologies companies used and commenting on any developments, we have covered a range of current *hot topics* that companies may wish to consider when developing and enhancing their embedded value approaches in the future. These include:

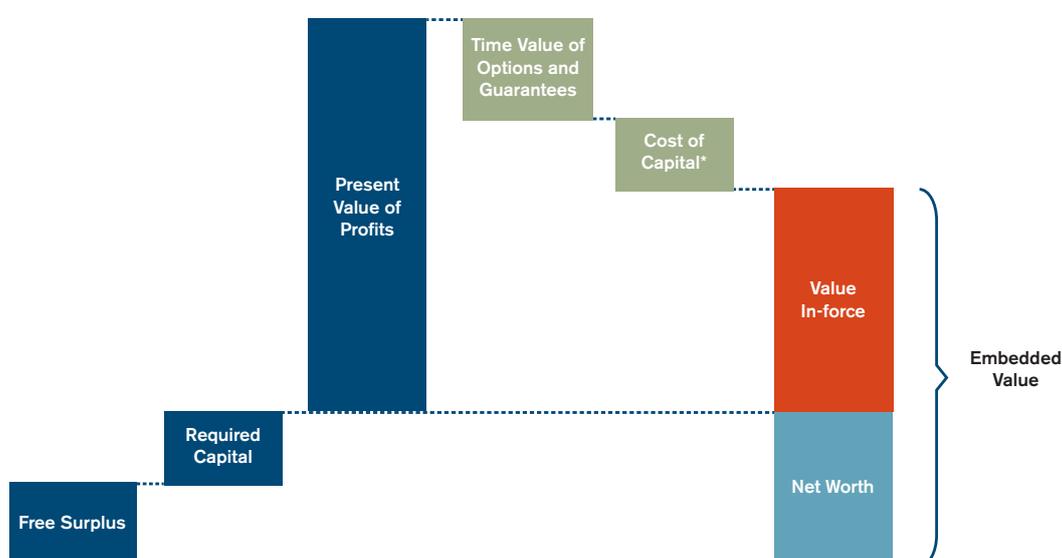
- Determining the risk discount rate (RDR)
- Calculating the cost of capital (CoC)
- Assessing the cost of residual non-hedgeable risks (CRNHR)
- Evaluating the time value of options and guarantees (TVOG)
- Disclosures in embedded value reporting
- Other measures of value (market capitalisation, IFRS, and Solvency II)

Before covering these topics in detail, we also provide a high-level overview of some of the key components of an embedded value calculation.

## EMBEDDED VALUE OVERVIEW

The embedded value of a company is intended to be a measure of the value of the shareholders' interests in the business. Over time, various principles and guidance have been issued by industry bodies to achieve consistency in the way embedded values are calculated between companies and reporting periods. Two of the main sets of guidance currently used by companies are the EEV Principles and the MCEV Principles. A brief outline of the methodologies under these sets of principles, including key terminology, is described below and shown in Figure 3.

FIGURE 3: SUMMARY COMPONENTS OF EMBEDDED VALUE



Notes:

\* Under the MCEV Principles, the cost of capital is split into frictional costs and the cost of residual non-hedgeable risks. Companies using the EEV Principles may also choose to adopt this approach.

Under both the MCEV and EEV approaches, the embedded value is calculated as the sum of the *net worth* and *value of in-force* (VIF) of the covered business, which, according to Principle 2 of both the EEV and the MCEV Principles, is defined as contracts regarded by local supervisors as being long-term life insurance business.

The covered business may also include short-term life insurance business, long-term accident or health insurance business, or group risk business. Under MCEV Principles, companies may disclose the Group Market Consistent Embedded Value (Group MCEV), which is a measure of the consolidated value of shareholders' interests in the total business of the company. The Group MCEV includes the unadjusted IFRS net asset value of the non-covered business (all business not classified as covered).

The *net worth* is equal to the *required capital* plus free surplus where:

- **Required capital** is the market value of assets, attributed to the business over and above that required to back the liabilities for the business and whose distribution to shareholders is restricted. The level of required capital may be set by reference to regulatory capital requirements, levels of capital requirements that achieve a target credit rating, internal model capital requirements, or a combination of these.

- **Free surplus** is the market value of any assets allocated to, but not required to support, the in-force business at the effective date of the embedded value calculation.

The *VIF* is equal to the *present value of future profits (PVFP)* less the *time value of options and guarantees* less the *cost of capital* where:

- **Present value of future profits** is the present value of the net of tax shareholder cash flows from both the in-force business and the assets backing the associated liabilities. The PVFP includes an allowance for the intrinsic value of financial options and guarantees but not cash flows arising from projected future new business. The economic assumptions used to calculate the PVFP can differ under EEV Principles and MCEV Principles. Under EEV, the PVFP may be calculated using real-world investment return assumptions and a discount rate that includes a margin for risks not captured elsewhere in the calculation. Under MCEV, the PVFP is typically calculated using a *certainty-equivalent* approach whereby assets are assumed to earn a return based on a risk-free curve and all cash flows are discounted using the same risk-free curve, though other approaches are possible.
- **Time value of options and guarantees** is the additional value of financial options and guarantees above the intrinsic value already allowed for in the calculation of the PVFP. This is typically calculated using stochastic techniques.
- **Cost of capital** is a deduction from the PVFP in respect of the additional costs from investing in assets backing the required capital via an insurance company rather than directly. Under EEV, the CoC is the difference between the required capital held at the effective date of the embedded value calculation and the present value of the projected releases of the required capital. Whereas under MCEV, the CoC is split into two independent components; the *frictional costs of capital* and the *cost of residual non-hedgeable risks*.
  - **Frictional costs of capital** reflect items such as the taxation and investment costs that arise on the assets backing the required capital.
  - **Cost of residual non-hedgeable risks** reflects the expected cost of capital related to non-hedgeable risks that can have an asymmetric impact on shareholder value (to the extent that these risks have not already been reflected in the PVFP or TVOG). These can include both financial and non-financial risks.

The breakdown of the number of companies from our sample of 32 using EEV, market-consistent EEV,<sup>5</sup> and MCEV Principles is shown in Figure 4. In addition, some companies follow equally valid approaches that do not entirely conform to either the MCEV or EEV Principles and they are captured under 'Other'. For example, Swiss Re reports under a basis known as its Economic Value Management framework.

The framework used by companies in 2014 has generally remained static, with the overwhelming majority of companies (some 95%) applying some form of market-consistent valuation. Achmea changed its approach to embedded value calculations and used Solvency II processes in 2014, aligning embedded value and its assumptions with Solvency II. Figure 4 shows the position of companies at year-ends 2013 and 2014.

**FIGURE 4: EV REPORTING PRINCIPLES**

EV REPORTING PRINCIPLES	2013			2014		
	CFO FORUM MEMBERS	OTHER COMPANIES	TOTAL	CFO FORUM MEMBERS	OTHER COMPANIES	TOTAL
EEV	1	1	2	1	1	2
Market-Consistent EEV	5	6	11	5	5	10
MCEV	9	8	17	9	8	17
Solvency II Based	0	0	0	0	1	1
Other	2	0	2	2	0	2
Total	17	15	32	17	15	32

Notes:

1. Swiss Re does not report explicitly under either EEV or MCEV principles but under a framework called Economic Value Management, Prudential uses market-consistent approach for shareholder-backed annuities and EEV Principles for the rest of the business.

<sup>5</sup> The term 'market-consistent EEV' describes a company reporting in compliance with the EEV principles but on a market-consistent basis.

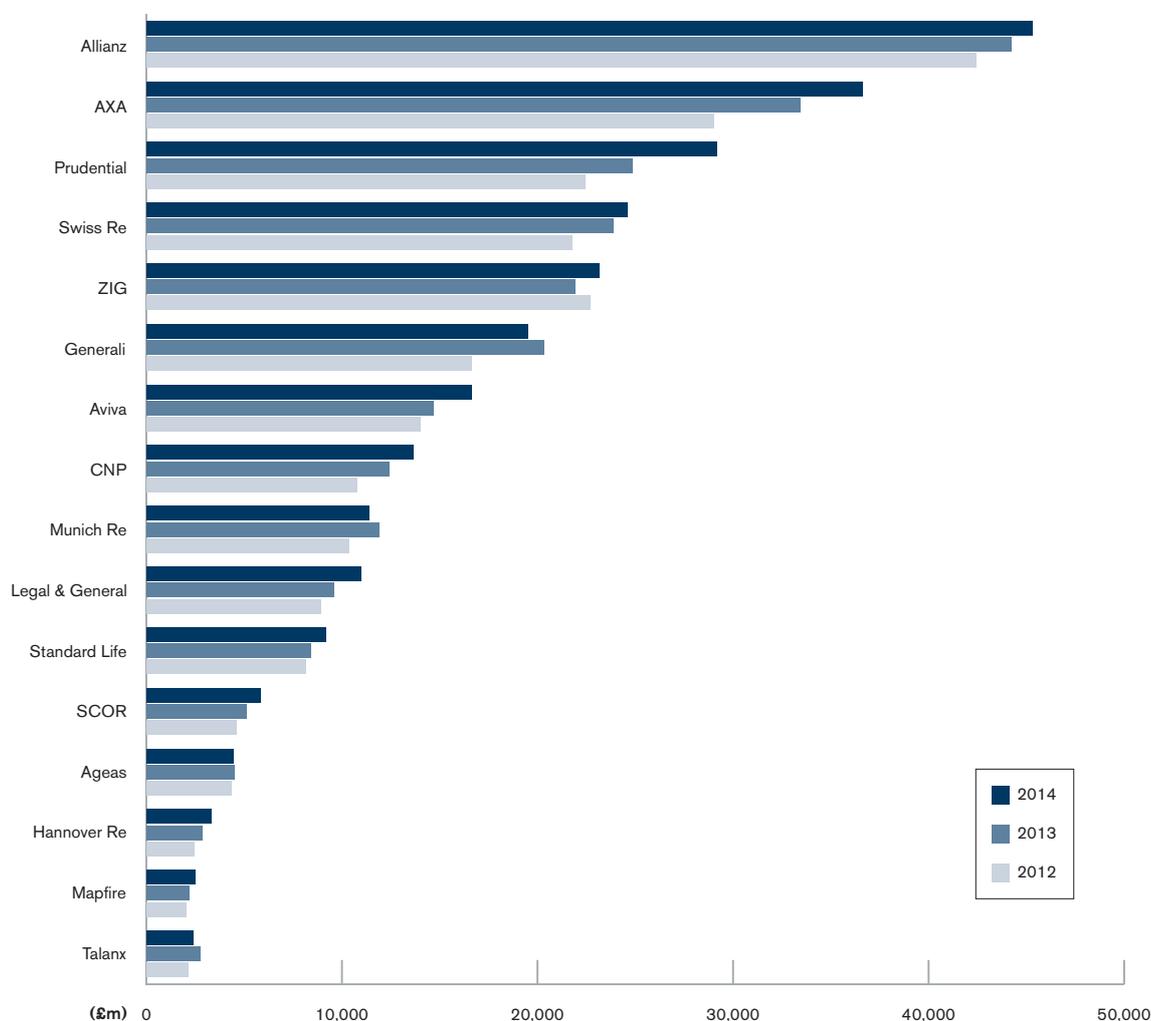
## EMBEDDED VALUE RESULTS

### Embedded Value

In 2014, many developed economies had another year of trying economic conditions and had to deal with a low interest rate environment. Generally, this resulted in a slower-than-anticipated economic growth and a difficult economic climate for insurers to operate in when compared with that experienced in 2013. The current CFO Forum members (that disclosed their embedded values at the end of 2014) had a combined embedded value of £259 billion (€333 billion) at the end of 2014 compared with £250 billion (€301 billion) at the end of 2013. Figure 5 shows the embedded value results of current CFO Forum members at the last three year-ends.

The majority of companies included in this study experienced an increase, of varying degrees, in their group embedded values compared with 2013. Four companies saw a decrease in the group embedded values.

**FIGURE 5: PUBLISHED EMBEDDED VALUE RESULTS OF CFO FORUM MEMBERS AT YEAR-END 2012, 2013, AND 2014**



Notes:

1. Ageas' embedded value is the total of 'life' and 'non-life and other insurance'.
2. Talanx has a 50% holding in Hannover Re. The embedded value for Talanx includes this participation in Hannover Re.
3. Past years' EV results are converted to GBP using end year 2014 exchange rate to exclude the effect of exchange rate in the comparison.

The embedded values considered in Figure 5 include both covered and non-covered business. Allianz, AXA, and Prudential take the top three positions in terms of the largest combined business embedded values. During 2014, the top performers based on percentage increases in embedded value were Prudential, Hannover Re, and Mapfre.

- Prudential's embedded value was enhanced by a 10% increase in EEV new business profit in 2014 compared with 2013. This improvement was driven by both an increase in volumes, and an increase in profitability resulting from repricing and product development.
- The main drivers of Hannover Re's increase in embedded value were a strong new business performance, higher-than-expected investment returns on free surplus and required capital (not offset by a negative impact on PVFP of reduction in interest rates), and favourable currency movements.
- The 15% increase in Mapfre's EEV is a result of higher new business volumes and higher profitability of new business, which are due to changes in business mix, the inclusion of a new portfolio because of an agreement with Bankia, and a number of other favourable circumstances—these include a downward shift in the yield curve used for discounting, a decrease in tax rates, and an increase in the value of the investment portfolio.

Some of the more modest percentage increases in embedded value were seen by Generali, Munich Re, and Talanx.

- Generali's EV performance was offset by negative economic variances during 2014, mainly as a result of a deteriorating financial position toward the end of the year. A significant fall in reference rates primarily affected the value of the in-force, and to a lesser extent the value of new business, whilst an increase in interest rate volatility also had an adverse effect. The reduction in the swap curve amounted to a fall of €2.9 billion in the VIF, whilst the increase in volatilities resulted in a €1.2 billion reduction.
- Similarly, Munich Re also experienced negative economic variances, which drove a fall in embedded value. An increase in volatilities and a sharp fall in interest rates resulted in a negative economic variance of €1,056 million, whilst model changes caused a fall of €857 million in embedded value. Some of these variances were, however, offset by positive foreign exchange movements in the reinsurance business.
- Talanx's primary domestic business was also affected by an adverse fall in interest rates and higher implied volatilities. Talanx recognised an increase in its value of financial options and guarantees through model enhancements. Talanx's reinsurance business, on the other hand (including the Hannover Re business), increased as a result of strong new business performance as described above.

### Value of New Business

Some companies noted that their improved values of new business mainly stemmed from management actions on repricing and redesigning of products, following years of challenging economic conditions. Overall, results for new business were fairly positive for the majority of companies in our sample. The total value of new business (VNB) written by the current CFO Forum members (that disclosed their values of new business at the end of 2014) was £11.4 billion (€14.7 billion) in 2014, compared to £11.9 billion (€14.3 billion) in 2013.

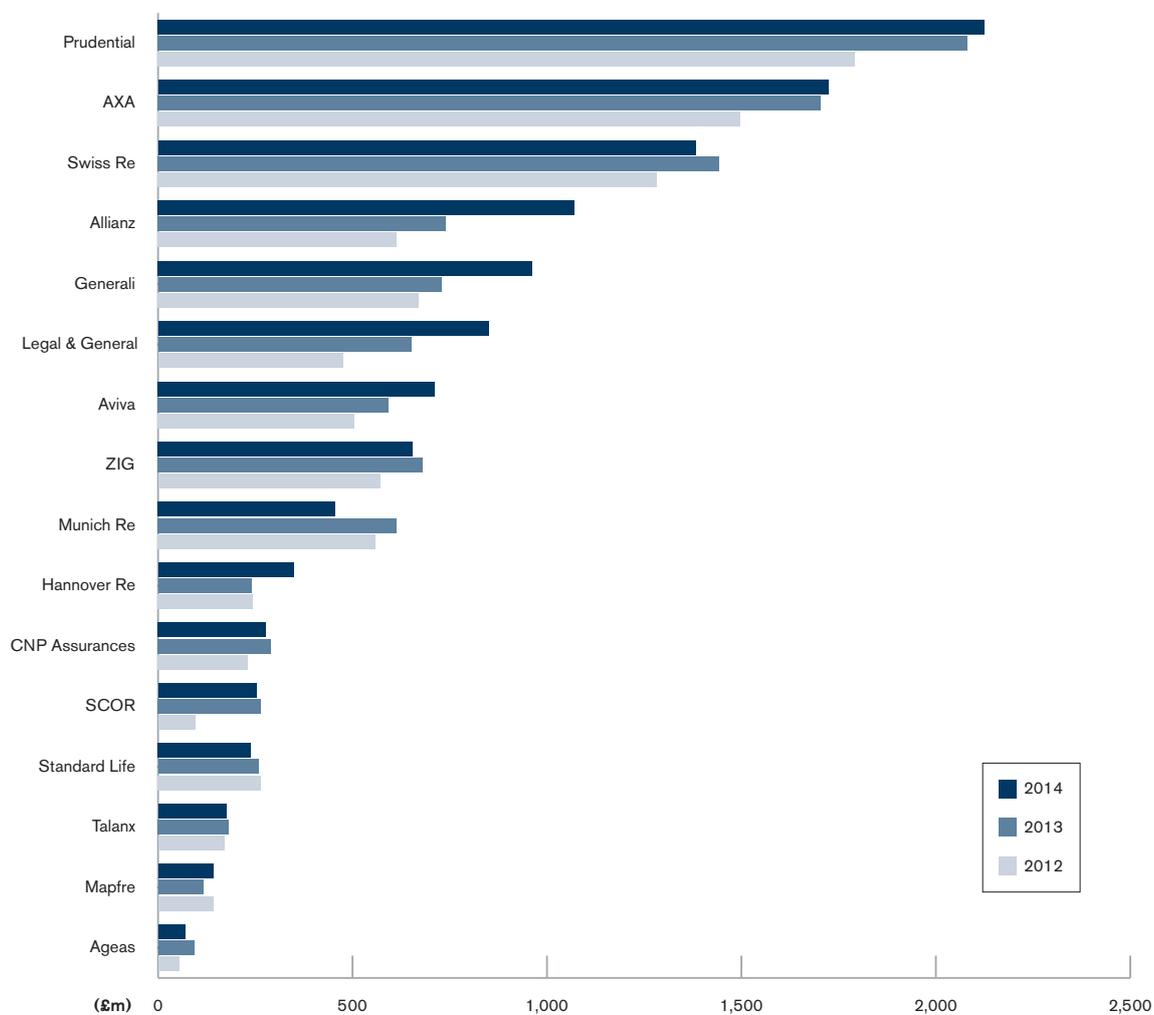
Figure 6 shows the values of new business over the last three years for the CFO Forum members disclosing their new business results. Prudential, AXA, and Swiss Re took the top three positions in terms of VNB in 2014. The top performer, based on percentage increase in the VNB, was Hannover Re, which saw a significant increase in VNB in 2014 compared with 2013, primarily driven by the increase in new business volumes from annuity treaties and increased margins from its foreign operations.

Underlying the value of new business results, the average new business margin<sup>6</sup> for the CFO Forum members decreased slightly to 3.5% in 2014 from 3.6% in 2013.<sup>7</sup> There was approximately a 12.3% increase in volumes over 2014 (5.6% in 2013). Companies in the CFO Forum that disclosed their VNB experienced a mixture of movements in their VNB. Allianz, Generali, and Legal & General had their VNB increased by more than 30%, whilst Ageas and Munich Re had their VNB dropped by more than 25%. Half of the companies in the CFO Forum increased their new business volumes, but a significant part (70%) saw the decrease of new business margins.

<sup>6</sup> Throughout this report, 'new business margin' is defined as the ratio of VNB to the present value of new business premiums.

<sup>7</sup> This excludes Aegon and Swiss Re.

**FIGURE 6: PUBLISHED VALUE OF NEW BUSINESS BY CFO FORUM MEMBERS AT YEAR-END 2012, 2013, AND 2014**



- Notes:
1. Swiss Re VNB only includes the value from its underwriting activities.
  2. Talanx has a 50% holding in Hannover Re. The VNB for Talanx includes this participation in Hannover Re.
  3. Past years' EV results are converted to GBP using end year 2014 exchange rate to exclude the effect of exchange rate change in the comparison.

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## METHODOLOGY HOT TOPICS

Based on our analysis of companies' embedded value methodologies, evolving practices and emerging market trends continue in three key *hot topic* areas. These include: (1) the construction of the risk discount rate; (2) how to allow for the cost of capital, including the cost of residual non-hedgeable risks; and (3) recognising the time value of options and guarantees. We consider each of these in detail below.

### Risk Discount Rate

The risk discount rate is one of the key assumptions required for a company's embedded value calculation (under either MCEV or EEV) as it is used to discount the projected cash flows.

In determining the risk discount rate, companies consider a number of key areas, such as:

- Whether to construct the risk discount rate using a *bottom-up* or a *top-down* approach. To comply with the MCEV Principles, a *bottom-up* approach is required.
- The underlying basis for the risk discount rate – typically swap rates or the return on government-issued debt.
- Allowing for the inclusion of a liquidity premium (also referred to as a matching adjustment under Solvency II) or volatility adjustment.<sup>8</sup>
- Extrapolating for longer durations where reliable data in the asset market may not exist.

Companies may adopt a number of different approaches to address these areas, which in some cases will be dependent on whether they are reporting under the EEV or MCEV Principles. An overview of the approaches used to determine the risk discount rates by companies as at year-end 2014 is provided in Figure 7. Each of these areas is discussed in further detail in the subsequent sections.

### Construction of Risk Discount Rate

Companies can construct their risk discount rates using either a top-down or a bottom-up approach under EEV Principles. However, in practice, the bottom-up approach has become an industry standard with only two companies (Legal & General and Delta Lloyd), amongst those included in the study, continuing to use a top-down approach. The top-down approach considers the risks a company is exposed to as a whole in order to derive a risk margin that applies to all future cash flows. This may be achieved, for example, by considering the company's *weighted average cost of capital*. By comparison, a bottom-up approach considers the risks to which each cash flow (or group of cash flows) is exposed, to determine a cash-flow-specific risk margin. Under MCEV, a bottom-up approach is required, whereas under EEV companies can choose to use either a top-down or bottom-up approach.

MCEV Principle 13 states that: '*VIF should be discounted using discount rates consistent with those that would be used to value such cash flows in the capital markets.*' To illustrate, equities are generally expected to yield returns above a risk-free asset to compensate for the additional risk inherent in equities. As such, under a market-consistent basis, in order to value equity cash flows, a risk discount rate that reflects the additional risk should be used. This logic equally applies to liability cash flows by valuing them consistently with traded assets that exhibit the same (or similar) characteristics. Therefore, where cash flows are fixed or vary linearly with market movements, companies can adopt the certainty-equivalent approach (i.e., assets are assumed to earn a rate based on a risk-free curve and all cash flows are discounted using the same risk-free curve) so as to achieve the same result. However, where companies use illiquid assets to match their liabilities, this can be reflected in the risk discount rate. The certainty-equivalent approach may also be adopted by firms reporting under the EEV Principles.

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<sup>8</sup> The matching adjustment increases the Solvency II discount rate and aims to reduce artificial volatility created by spread movements in portfolios where assets are held to maturity. The volatility adjustment also dampens the impact of short-term volatility on portfolios not subject to the matching adjustment. Please see page 23 for further discussion.

**FIGURE 7: OVERVIEW OF RISK DISCOUNT RATE CONSTRUCTION**

COMPANY	PRINCIPLES	RISK DISCOUNT RATE METHODOLOGY	UNDERLYING BASIS FOR RISK DISCOUNT RATE	LIQUIDITY PREMIUM	EXTRAPOLATION OF RISK-FREE CURVE
<b>CFO Forum Members</b>					
Ageas	EEV (MC)	Bottom up	Swaps, -10 bps for credit risk	Yes, VA <sup>4</sup> for EUR, QIS 5 <sup>5</sup> for USD and HKD	Yes, Solvency II <sup>9</sup>
Allianz	MCEV	Bottom up	Swaps, CRA <sup>2</sup>	Yes, VA and MA <sup>6</sup>	Yes, Solvency II
Aviva	MCEV	Bottom up	Swaps	Yes, QIS 5	Yes, other <sup>10</sup>
AXA	EEV (MC)	Bottom up	Swaps	Yes, QIS 5	Yes, Solvency II
CNP	MCEV	Bottom up	Swaps	Yes, QIS 5	Yes, Solvency II
Generali	MCEV	Bottom up	Swaps	Yes, QIS 5	Yes, Solvency II
Hannover Re	MCEV	Bottom up	Swaps, CRA	No	Not disclosed
Legal & General	EEV	Top down	Gov. Bonds	Not Disclosed <sup>7</sup>	Not disclosed
Lloyds TSB	EEV (MC)	Bottom up	Swaps	Yes, method not disclosed	Not disclosed
Mapfre	EEV (MC)	Bottom up	Swaps	Not disclosed	Not disclosed
Munich Re	MCEV	Bottom up	Swaps	No	Yes, other <sup>10</sup>
Prudential	EEV (MC)	Bottom up	Swaps (Annuities) <sup>3</sup> Gov. Bonds (Other)	Yes, method not disclosed	Not disclosed
SCOR	MCEV	Bottom up	Swaps, -10 bps for credit risk	No	Yes, Solvency II
Standard Life	EEV (MC)	Bottom up	Gov. Bonds	Yes, method not disclosed	Not disclosed
Swiss Re	Other <sup>1</sup>	Bottom up	Gov. Bonds	No	Not disclosed
Talanx	MCEV	Bottom up	Swaps, CRA	Yes, VA	Yes, Solvency II
ZIG	MCEV	Bottom up	Swaps	Yes, QIS 5	Not disclosed
<b>Other Companies</b>					
Achmea (Eureko)	Solvency II Based	Bottom up	Swaps, CRA	Yes, VA	Not disclosed
Baloise	MCEV	Bottom up	Swaps	Yes, QIS 5	Yes, Solvency II
Chesnara	EEV (MC)	Bottom up	Swaps	No	Not disclosed
Delta Lloyd	EEV	Top down	WACC	N/A	N/A
Resolution (Friends)	MCEV	Bottom up	Swaps	Yes, other <sup>8</sup>	Yes, other <sup>11</sup>
Mediolanum	MCEV	Bottom up	Swaps	No	Yes, other <sup>12</sup>
Old Mutual	MCEV	Bottom up	Swaps	Yes, method not disclosed	Yes, not disclosed
Phoenix	MCEV	Bottom up	Gov. Bonds, +10 bps	Yes, method not disclosed	Yes, not disclosed
PZU	EEV (MC)	Bottom up	Gov. Bonds	Not disclosed	Yes, other <sup>11</sup>
Royal London	EEV (MC)	Bottom up	Gov. Bonds	Not disclosed	Not disclosed
St James's Place	EEV (MC)	Bottom up	Gov. Bonds	Not disclosed	Not disclosed
Storebrand	EEV (MC)	Bottom up	Swaps, CRA	Yes, VA	Yes, Solvency II
Swiss Life	MCEV	Bottom up	Swaps	Yes, QIS 5	Yes, QIS 5 <sup>13</sup>
Uniqqa	MCEV	Bottom up	Swaps, CRA	Yes, QIS 5	Yes, Solvency II
VIG	MCEV	Bottom up	Swaps	Yes, QIS 5	Yes, Solvency II

Notes:

- Swiss Re uses an Economic Value Management framework.
- Credit Risk Adjustment is applied in line with the EIOPA paper "Consultation paper on a technical document regarding the risk free interest rate term structure."
- Prudential uses swaps for its UK shareholder-backed annuity business.
- Volatility adjustment is in line with the latest Solvency II framework.
- QIS 5 methodology to deriving Liquidity Premium is to take 50% of (corporate spread over swaps less 40bps) if greater than zero.
- Matching adjustment is in line with the latest Solvency II framework.
- An allowance for a liquidity premium can be regarded to be implicit within the spread over the risk-free rate for certain assets.
- Methodology stated as consideration of negative basis trade and structural models.
- Smith-Wilson approach using latest Solvency II parameters.
- Nelson-Siegel extrapolation methodology.
- Assume last observable forward rate is constant thereafter.
- Spot rates after a certain duration are extrapolated at a rate equal to the slope of the curve in the preceding 10 years.
- Smith-Wilson approach using QIS 5 parameters.

### Basis for Risk-Free Rate

To begin the construction of a suitable risk discount rate curve, companies will typically identify returns on assets in the market that are a proxy to the *risk-free* rate. The MCEV Principles term this proxy the *reference rate*. In practice, the starting point for the reference rate is either government bonds or interest-rate swaps, based on interbank lending rates. However, in reality, no assets exist that are completely risk-free, as even bonds issued by the most secure government will carry some residual level of risk.

Based on our study, about half of companies reporting under the EEV Principles use swap rates as a starting point for the reference rate and all but one company reporting under MCEV Principles use swap rates – Phoenix continued to use government bonds as the basis for its reference rate.

Companies that opted to use swap rates as the basis for their reference rates also needed to decide which swap rates to use. In the recent past, industry practice has seemed to suggest swaps based on interbank lending rates, such as the London Interbank Offered Rate (LIBOR) in the UK for sterling-based cash flows. As the underlying rate (e.g., LIBOR) contains some level of compensation for the credit risk associated with lending money to a bank, even for a short duration, an adjustment is sometimes made to the resulting interest rate curve. Ageas and SCOR continued to apply a reduction to the swap rate – SCOR and four companies (Allianz, Hannover Re, Achmea, and Uniqa) applied the credit risk adjustment (CRA) in line with the latest Solvency II developments outlined in 'Consultation Paper on a Technical document regarding the risk free interest rate term structure,' published by EIOPA in November 2014.

In recent years, there has been an industry move to use overnight deposit rates such as the Sterling Overnight Index Average (SONIA) and the Euro Overnight Index Average (EONIA), instead of the traditional LIBOR, as the discount rate for swap valuation purposes. With Dodd-Frank and European Market Infrastructure Regulations (EMIR) fully under way, the use of this approach is getting more widespread within the banking industry. Most fixed-income desks use this methodology as standard in their market pricing. All clearinghouses also use this discounting basis to calculate variation margin calls and receipts for cleared interest rate swap positions, and the entire interest rate swap market moves toward central clearing under Dodd-Frank and EMIR.

Use of a discount rate based on SONIA, for example, may also have advantages over one based on LIBOR because:

- It is based on data from actual transactions rather than a survey of anticipated transaction rates
- It should contain less of a premium for credit risk as the term of the deposit is overnight rather than the usual three to six months for LIBOR

This may indicate that a reference rate based on a SONIA swap rate may be considered a better proxy for a *risk-free* yield. The insurance industry though is reluctant to accept overnight indexed swaps (OIS) as the equivalent of a risk-free curve. The key reason for this is that, at present, the market for swaps with floating coupons based on SONIA is not as developed as that of LIBOR, in particular at longer terms. Therefore, a SONIA swap rate may not be suitable in determining the reference rate for an embedded value calculation because the duration at which data becomes unreliable is much shorter. If the market for such swaps were to become more developed, then the use of SONIA swap rates may offer a valid alternative.

Our analysis of market data shows that there was a significant increase in overall trading volumes in 2014 compared with 2013, but this increase mainly occurred at swaps of lower durations; the trading volumes of swaps at longer durations still remain low and that explains why the insurance industry has not adopted the use of OIS for the risk-free curve.

### Allowance for Liquidity Premium

Typically, the additional return on an asset (such as a corporate bond) over the risk-free yield is considered to be made up of three key components, which compensate for: (1) the expected cost of defaults of the issuer including recovery; (2) the uncertainty surrounding the unexpected cost of defaults; and (3) other risks predominantly thought to be in respect of the illiquidity of the asset, particularly in adverse conditions, known as the liquidity premium. Consequently, companies that closely match their asset and liability positions to mitigate spread risk may consider it appropriate to make an allowance for the latter part of the additional yield they expect to receive in the form of a liquidity premium adjustment. Final Solvency II text allows use of a matching adjustment (MA) and volatility adjustment (VA) to the risk-free rate to reduce short-term market volatility.

Based on their disclosures, companies started moving away from QIS5 methodology and aligning their adjustments to risk-free rates with Solvency II—five companies (Ageas, Allianz, Talanx, Achmea, and Storebrand) used VA as an adjustment to their discount rates. Allianz was the only company to use MA as an adjustment to the discount rate for its pension business in Spain. In 2013, no company used VA or MA for their embedded values. Wider use of VA in 2014 can be explained by increased clarity around Solvency II requirements following the finalisation and adoption of Delegated Acts.

For the purposes of the 2014 year-end embedded value reporting, the prevailing approach used by companies was the QIS5 approach to the liquidity premium, which possibly reflects the fact that application of MA is computationally more intensive, and also that application of the MA has more restrictive conditions than the QIS5 approach to the liquidity premium—potentially companies can continue to use liquidity premium in their embedded value calculations, but not apply MA in their Solvency II reporting.

In general, allowances for liquidity premiums remained generally unchanged over 2014, as shown in Figure 8. This reflects the observed market conditions over 2014 and is not due to a shift in methodology, except of Allianz's use of the MA.

Companies disclosing that they applied no liquidity premium adjustment at the end of 2014 continued to be predominantly reinsurers, including Hannover Re, Munich Re, Swiss Re, and SCOR. Despite the increased focus on allowances for liquidity premiums, around a quarter of the companies in our study chose not to disclose whether they had applied liquidity premium adjustments or not. Legal & General adopted a top-down approach to setting its risk discount rates and therefore disclosed the yields that were used rather than the value of liquidity premiums, as they are implicit within the approach. Consequently, Figure 8 summarises only those companies for which the use and value of a liquidity premium adjustment was explicitly disclosed.

**FIGURE 8: SUMMARY OF LIQUIDITY PREMIUM ADJUSTMENTS AS AT YEAR-END 2013 AND 2014**

COMPANY	UNDERLYING BASIS FOR RISK DISCOUNT RATE	LIQUIDITY PREMIUM METHOD	VALUE AT 2013 (BPS)	VALUE AT 2014 (BPS)	SENSITIVITY
<b>CFO Forum Members</b>					
Ageas	Swaps	VA for EUR, QIS 5 for USD and HKD	20-24 (Euro) 27 (UK) 38 (US) 29 (HKD)	19 (Euro, VA) 47 (US, LP) 36 (HKD, LP)	No VA VA + 10bps
Allianz	Swaps	MA for pension Spain business, VA for EUR, QIS 5 for CHF	44 (Euro) 59 (US) 3 (Switzerland)	13 (Euro, VA) 50 (US, VA) 28 (Switzerland, VA)	Not disclosed
Aviva	Swaps	QIS 5	110 (UK Annuity) 28 (France, Ireland, Spain–annuity) 21 (France, Spain, Italy–participating business)	109 (UK Annuity) 19 (France, Ireland, Spain–annuity) 15 (France, Spain, Italy–participating business)	Liquidity Premium + 10bps
AXA	Swaps	QIS 5	44 (UK) 30 (Euro) 49 (US) 0 (Switzerland)	53 (UK) 20 (Euro) 61 (US) 0 (Switzerland)	No Liquidity Premium Liquidity Premium + 10bps
CNP	Swaps	QIS 5	29 (Euro)	24 (Euro)	Liquidity Premium + 10bps
Generali	Swaps	QIS 5	52 (UK) 28 (Euro) 3 (Switzerland)	61 (UK) 19 (Euro) 0 (Switzerland)	No Liquidity Premium Liquidity Premium + 10bps
Lloyds TSB	Swaps	Not disclosed	91 (UK Annuities)	120 (UK Annuities)	Not disclosed
Prudential	Swaps (Annuities), Gov. Bonds (Other)	Not disclosed	UK Annuities 71 (Existing business) 80 (New business)	UK Annuities 85 (Existing business) 79 (New business)	Liquidity Premium + 10bps
Talanx	Swaps	Credit adjustment, VA for EUR	29 (Primary annuity business) 15 (Primary participating business)	14 (EUR, primary business) 8 (PLN, primary business)	Not disclosed
ZIG	Swaps	QIS 5	45 (US) 44 (UK) 22 (Euro) 3 (Swiss)	52 (US) 17 (UK) 62 (Euro) 0 (Swiss)	Not disclosed
<b>Other Companies</b>					
Achmea	Swaps	VA	22 (Euro)	Not disclosed	Not disclosed
Baloise	Swaps	QIS 5	22 (Euro) 0 (Switzerland)	18 (Euro) 0 (Switzerland)	No Liquidity Premium
Resolution (Friends)	Swaps	Other	60 (UK Annuities and Heritage Existing)	70 (UK Annuities and Heritage Existing)	No Liquidity Premium (annuity business)
Old Mutual	Swaps	Not disclosed	OMLAC (SA) 50 (Immediate Annuities) 40 (Fixed bond)	OMLAC (SA) 55 (Immediate Annuities) 50 (Fixed bond)	Liquidity Premium + 10bps
Phoenix	Gov. Bonds	Not disclosed	36 (UK)	46 (UK)	Not disclosed
Swiss Life	Swaps	QIS 5	56 (UK) 29 (Euro) 47 (US) 22 (Switzerland)	69 (UK) 24 (Euro) 63 (US) 20 (Switzerland)	Not disclosed
Uniqa	Swaps	QIS 5	39 (EUR) 14 (CZ/HU/PL)	34 (EUR) 12 (CZ/HU/PL)	No Liquidity Premium
VIG	Swaps	QIS 5	17 (Euro) 1-17 (Other)	9 (Euro) 2-16 (Other)	No Liquidity Premium

Notes: MA = matching adjustment, VA = volatility adjustment, LP = liquidity premium, OMLAC (SA) is Old Mutual Life Assurance Company South Africa

At year-end 2014, liquidity premiums applied remained generally within the region of 20 to 100 bps. For the last three year-ends, one company in our sample disclosed the use of a liquidity premium in excess of 100 bps, namely Aviva, which maintained a liquidity premium in excess of 100 bps for its annuity business; Lloyds TSB also disclosed a liquidity premium in excess of 100 bps in 2014.

Recognising the sensitivity of the results to the liquidity premium, a number of companies also disclosed embedded value sensitivities to the size of the liquidity premium. These sensitivities were generally based on a 10 bps increase to the liquidity premium or the removal of the liquidity premium. Swiss Re does not include a liquidity premium in its main results, and therefore provides sensitivities to the inclusion of 10, 50, and 100 bps liquidity premiums, which result in an increase in embedded value. Similarly, Munich Re and Hannover Re disclose the sensitivity to the inclusion of a liquidity premium of 10 bps.

### Yield Curve Extrapolation

In order to calculate the VIF component, some companies require a risk-free curve that extends to very long durations, reflecting both current market conditions and long-term economic views. This may pose a challenge where available market data is of a shorter duration than the projected cash flows. Even where data is available for very long swap contracts or sovereign bonds, as the case may be, the market may not be sufficiently deep or liquid for such data to be reliable. Therefore, to obtain suitable rates at such long durations, companies may extrapolate the risk-free yield curve from the last observed liquid market data point (*last liquid point*, or LLP) to some long-term equilibrium rate (sometimes referred to as the *ultimate forward rate*, or UFR). Extrapolating the risk-free curve from the LLP may help to reduce the impact on the VIF calculation of volatility that is due to demand and supply imbalances for the long durations in the asset market.

There are a number of extrapolation methods available to companies, such as:

- Assuming that a flat rate continues beyond a certain point
- Assuming a margin over government bond yields at longer durations
- Using the Smith-Wilson technique (consistent with Solvency II)
- Using the Nelson-Siegel method, which fits a model to the observed yield curve

Figure 7 above shows that at year-end 2014, as was the case at year-end 2013, around two-thirds of the companies disclosed that they were using extrapolation techniques. Of those disclosing their extrapolation methodologies, the Solvency II approach was most prevalent, with most of the companies aligning their parameters (including UFR, LLP, and convergence period) with the final Solvency II regulation.

Suitable values for key inputs into the chosen extrapolation method, such as the LLP, the UFR, and the period over which convergence to the UFR is achieved, can vary over time. As such, companies should ensure that these values are fit for their intended purpose before using them in their embedded value reporting. The change in extrapolation approach may have a significant impact on embedded value results. For example, Storebrand reported a negative impact of NOK 2,870 million (€332.43 million, £258.3 million) from the change to the Solvency II yield curve.

### Cost of Capital

Cost of capital is typically reflected as a deduction from the PVFP to reflect the fact that assets backing the required capital are held within an insurance company rather than directly and, therefore, cannot be distributed to shareholders immediately. Additional costs may arise from investing in assets via an insurance company, such as additional taxation, investment expenses, or the fact that investors do not have direct control over their capital (known as *agency costs*). Cost of capital may also arise in respect of non-hedgeable risks, which are covered separately in the next section.

Under Principle 8 of the MCEV Principles, *'an allowance should be made for the frictional costs of required capital for covered business. The allowance is independent of the allowance for non-hedgeable risks.'*

Companies reporting under MCEV Principles typically allow for the frictional costs of capital within the investment income on assets backing the required capital by:

- Projecting investment returns using the reference rate net of tax and investment management expenses
- Discounting using the reference rate gross of tax and investment management expenses

Companies may also adopt such an approach under the EEV Principles, especially if they use a market-consistent basis. Alternatively, the cost of capital may be calculated based on the difference between the *real-world* investment return assumptions and the risk discount rate.

The majority of companies reporting a market-consistent embedded value calculate the cost of capital using the frictional cost approach, which is the approach required under MCEV Principles. However, the definition of required capital differs between companies. As at year-end 2014, almost all companies disclosed that they set their required capital by reference to local regulatory requirements, with the vast majority of them also taking into consideration the result from an internal capital model. In addition, of those that disclosed the basis of their required capital, approximately a third of the companies disclosed the consideration of the level of capital also needed to achieve a certain target credit rating.

### Cost of Residual Non-Hedgeable Risks

Generally, non-financial risks such as mortality, longevity, morbidity, persistency, expenses, operational, and tax risks are regarded as non-hedgeable. By comparison, the majority of financial risks are generally considered to be hedgeable. However, there are still some financial risks that fall under the banner of non-hedgeable. These financial non-hedgeable risks often arise from uncertainty in setting best-estimate assumptions, which can arise from a lack of deep and liquid market information. To illustrate, companies may employ extrapolation techniques to determine appropriate risk-free rates to apply at longer durations and the impact associated with this uncertainty should be captured in the CRNHR, if not already allowed for in the PVFP or TVOG. Companies that do not recognise the impact of this uncertainty could underestimate the CRNHR.

Principle 9 of the MCEV Principles states: *'An allowance should be made for the cost of non-hedgeable risks not already allowed for in the time value of options and guarantees or the PVFP. This allowance should include the impact of non-hedgeable non-financial risks and non-hedgeable financial risks. An appropriate method of determining the allowance for the cost of residual non-hedgeable risks should be applied and sufficient disclosures provided to enable a comparison to a cost of capital methodology.'*

When assessing the CRNHR, companies usually consider the following:

- The cost of non-hedgeable risks (NHR) where they have not already been allowed for in the PVFP or TVOGs
- The asymmetry<sup>9</sup> of risks and the impact that this has on shareholder value
- The cost associated with the uncertainty in setting best-estimate assumptions

Under MCEV Principles, regardless of how companies allow for their CRNHR, the equivalent average cost-of-capital charge should be presented. The residual capital derived in respect of the residual non-hedgeable risks should be based on a company's internal economic capital model. The cost-of-capital charge represents the excess return or risk premium that investors might reasonably expect on capital exposed to such residual risks.

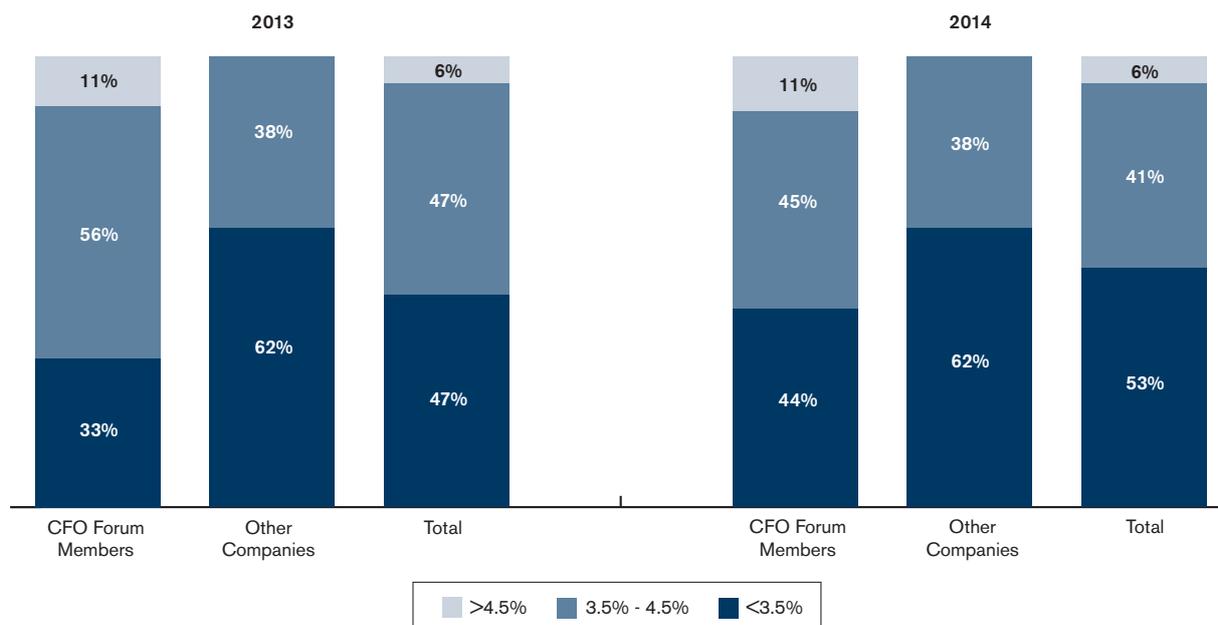
Companies may, however, determine the most appropriate level of internal capital over their self-determined future time horizons as appropriate for each company's business model and strategy. For example, selecting a higher confidence level in the capital calculation for the CRNHR may be in line with maintaining a target company credit rating. However, companies are required to express this as the equivalent average cost-of-capital charge based on the capital required on a 99.5% confidence interval over a one-year time horizon.

The majority of companies continue to use approximate methods to project the residual NHR-based capital, for example by running off the initial capital derived over the projection term in line with certain drivers. The drivers reported by companies generally include reserves, premiums, and sums at risk. The choice of drivers has generally remained stable.

<sup>9</sup> A risk where equal and opposite movements upwards and downwards result in financial outcomes that are not of equal magnitude.

Figure 9 shows the range of the equivalent average cost-of-capital charges based on the companies included in our analysis reporting under MCEV Principles, split by CFO Forum members and other companies. Most companies have kept the same methodologies and maintained their cost-of-capital charge consistent with last year, with Aviva decreasing its charge from 3.9% to 3.2%.

**FIGURE 9: EQUIVALENT AVERAGE COST-OF-CAPITAL CHARGE FOR NON-HEDGEABLE RISKS AT YEAR-END 2013 AND 2014**



A lower charge does not necessarily imply a weaker assumption or lower overall CRNHR. Instead, it may capture the different extents to which companies allow for NHR in their PVFP and TVOGs, diversification, and varying business models and strategies, as well as the general differences in the wider embedded value methodologies adopted by companies. The equivalent average cost-of-capital charges differ across companies. At the lower end of the spectrum, one company made no allowance for the CRNHR, while the highest observed in our analysis was 7% per annum. The company which made no allowance stated that the CRNHR was not applicable because of the insurer's particular business model: the insurer has a closed book with no new business, using significant outsourcing, and the insurer states that it has succeeded in closing out significant legacy risks. This insurer discloses a CRNHR as a sensitivity to the main results.

The CRNHR has similarities to the risk margin under Solvency II. A key difference between the risk margin and the CRNHR is that the risk margin covers all business and not just long-term business, whereas the CRNHR will be in respect of long-term business only. As such, the risk margin will have explicit allowance for diversification between covered and non-covered business, which is different from the MCEV Principles.

The Delegated Acts require a cost-of-capital charge of 6% and, whilst not directly comparable, our analysis indicates this is potentially higher than the charge companies are currently considering in their MCEV reporting. Achmea, which switched from an MCEV approach to one based on Solvency II, continues to use 4.5% as a charge for CRNHR, stating that this is the only difference between its Solvency II and embedded value results.

Some companies identified particular concerns with the CRNHR approach, citing that, according to the MCEV Principles, no allowance for further risk management actions is anticipated or reflected and that this was not representative of the company's future risk profile. Consequently, providing sensitivities will help companies to demonstrate to observers the future potential impact of their risk management profiles and plans.

Companies continue, in the main, to allow for diversification in line with the MCEV Principles, which state that diversification should not be allowed for between hedgeable and non-hedgeable risks or between covered and non-covered business in the CRNHR. However, a few companies, such as ZIG and Munich Re, have recognised diversification benefits between covered and non-covered business. This is in line with these companies' approaches at the end of 2013.

Certain challenges in this area still remain to be addressed going forward and there is likely to be continued evolution in this area. In addition to the approach to deriving the discount rate, the cost of capital applied in respect of residual non-hedgeable risks presents another area where embedded value supplementary reporting and supervisory reporting may diverge in the future. Moreover, it is an area where direct comparison of the cost of holding such capital may become more difficult.

### Time Value of Options and Guarantees

The impact of financial options and guarantees can be split into two components. The first is the effect on the PVFP with respect to the intrinsic value of such financial options and guarantees. The second is the time value of financial options and guarantees. The TVOG is the difference between the central PVFP capturing the intrinsic impact and the average of the PVFPs over a range of scenarios obtained by stochastic calculations.

The TVOG corresponds to the asymmetry in the impact over a range of scenarios on the distributable earnings to shareholders. For example, in the case of participating contracts, profits are shared between shareholders and policyholders. Losses, however, are only shared up to a certain point, after which shareholders bear all the subsequent losses. This can be further exacerbated by the actions of policyholders (dynamic policyholder behaviour).

The features of products that generally give rise to an assessment of TVOG can include interest rate guarantees on traditional products, profit-sharing features such as bonuses or levels of credited rates, guaranteed benefits on unit-linked products, and guaranteed annuity options.

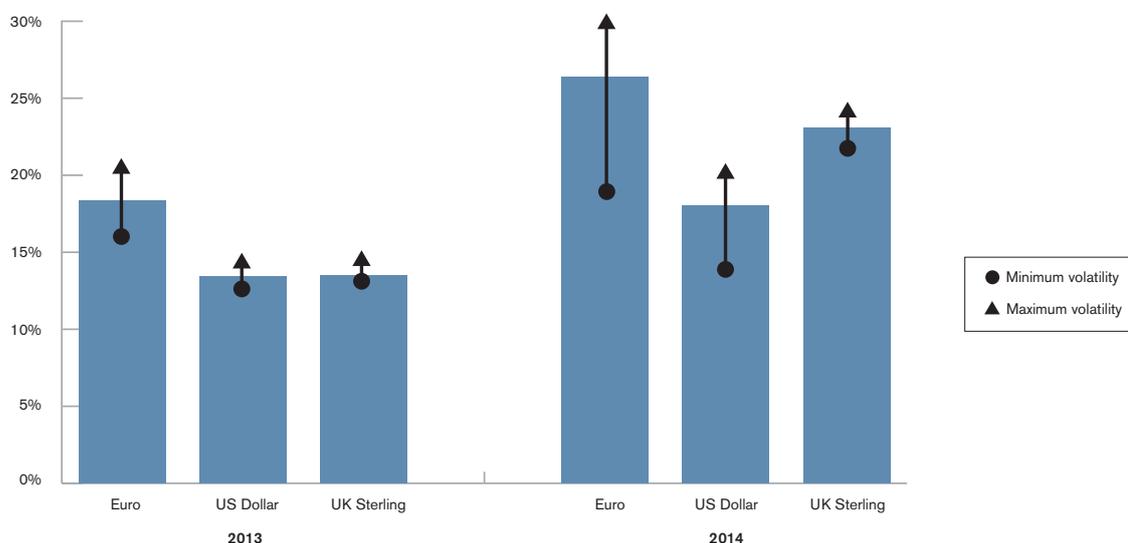
As noted, companies are required to assess the TVOG using stochastic techniques. Closed-form solutions can also be used where they lead to sufficiently accurate results but may not be suitable in valuing certain guarantees. The stochastic models must be appropriately calibrated and internally consistent with the rest of the modelling methodologies and approaches. Management actions can be allowed for which can include actions regarding the credited rate to policies, bonus rates, charges to asset shares, and investment strategies. These management actions can be reflected provided they have passed through the company's normal governance and approval processes, are consistent with the operating environment, and take into account the market reaction to discretion. For example, Phoenix discusses management actions in its disclosures covering a comprehensive suite of actions that may be taken in relation to investment, discretionary benefits, and asset share charges in respect of guarantee costs, which have been signed off at a board level and therefore can be reflected in stochastic modelling.

Principle 7 of both the EEV and MCEV Principles requires firms to make an appropriate allowance for the potential impacts on shareholder values from financial options and guarantees. In carrying out this assessment, an important element is the calibration of companies' stochastic models to the implied volatility from appropriate financial market instruments.

For year-end 2014, virtually all companies that disclosed their approaches used end-period implied volatilities for interest rates and equities. Hannover Re continued to use end-September data for calibration purposes but reflected significant differences between September 2014 and December 2014 via an adjustment. The majority of companies continued to base volatility assumptions for property on historical analysis and expert opinion in the absence of meaningful option prices from which implied volatility could be accurately derived.

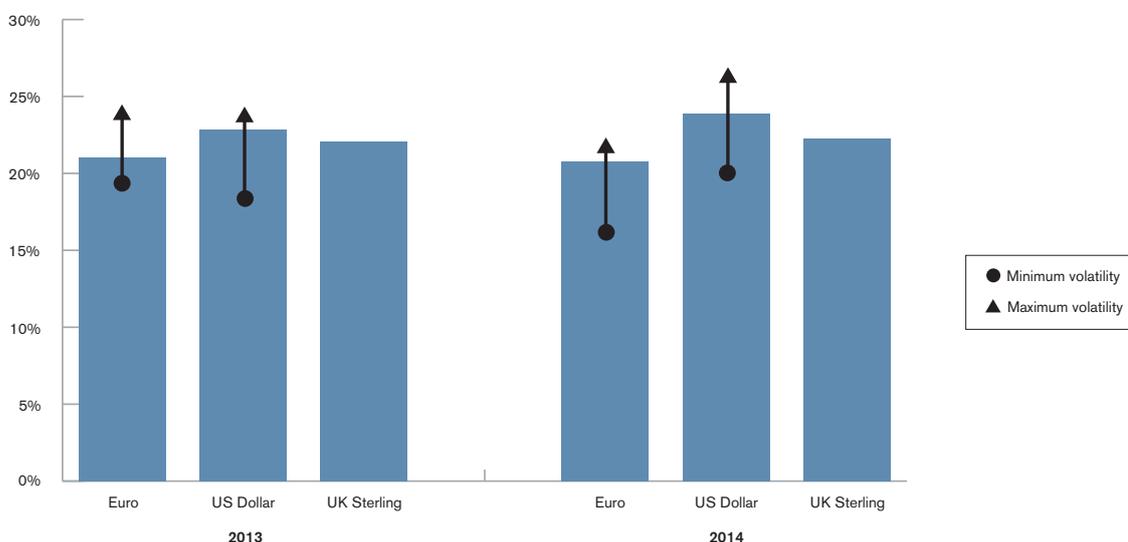
Figures 10A and 10B show the average, the highest, and the lowest implied volatility levels used by companies complying with the MCEV Principles (where the volatility from swaptions shows the volatility of risk-free rates; and equity option volatility shows the volatility used for equity). Furthermore, the majority of companies continued to base asset correlations on historical market relationships. The MCEV guidance in this area requires companies to check correlations against external sources for reasonableness, which was, in part, in anticipation of future sources of correlation information becoming available.

**FIGURE 10A: SWAPTION-IMPLIED VOLATILITIES: AVERAGE, HIGHEST, AND LOWEST FOR MCEV COMPANIES**



Notes:  
1. Swaption-implied volatilities are based on 20-year swap length, 20-year option term.

**FIGURE 10B: EQUITY-IMPLIED VOLATILITIES: AVERAGE, HIGHEST, AND LOWEST FOR MCEV COMPANIES**



Notes:  
1. Equities based on 10-year options.  
2. For UK Sterling the minimum and maximum in 2013 was 22.0 and 22.3, respectively. In 2014 the minimum and maximum was 22.07 and 22.87, respectively.

As can be seen, equity-implied volatility across the different regions remained broadly at the same level as last year. Euro, US dollar, and UK sterling interest rate volatility increased significantly over 2014. Although the average level of equity volatility stayed level, the range of volatilities disclosed for Eurozone countries was wider than this time last year. This is mainly a consequence of the volatility disclosed by Vienna, which, at 16%, was lower by 4%, in absolute terms, than any other company included in our study. All other companies disclosed equity-implied volatilities in the range of 20.0% to 22.0% for Eurozone countries. There is a wider range of interest rate volatilities disclosed for the euro. This is to be expected, as the swaptions used to derive these volatilities will depend on the country of issue, regardless of the currency. The increased range of interest rate volatilities for the US dollar is due to Hannover Re, which used a volatility of 14.7% while all other companies disclosed US dollar volatilities in the range of 18.0% to 20.0%.

Dynamic policyholder behaviour is included in many companies' assessments of TVOG. In particular, a number of companies recognise the impact of dynamic policyholder behaviour under certain economic scenarios. For example, if the guarantees attaching to certain product types (e.g., guaranteed annuity options) were projected to become in-the-money under certain scenarios it could result in higher take-up rates of the option and, possibly, an increase in the best-estimate assumption for the level of persistency.

Figure 11 shows that, of those companies that disclosed the number of scenarios used, the majority applied 1,000 economic scenarios on a market-consistent basis. One might reasonably expect that, with increased computing capabilities and heightened focus on the statistical distributions of (particularly asymmetric) risks, companies might move to increase the number of scenarios considered in their stochastic modelling, but there was no increase in the number of scenarios used in 2014 compared with 2013. As companies complete their preparations for Solvency II over 2015, this is an area that may be subject to development.

**FIGURE 11: TIME VALUE OF OPTIONS AND GUARANTEES - NUMBER OF SCENARIOS AND POLICYHOLDER BEHAVIOUR**

COMPANY	OPTIONS AND GUARANTEES	SCENARIOS	USE OF DYNAMIC POLICYHOLDER BEHAVIOUR
<b>CFO Forum Members</b>			
Ageas	Market-consistent	1,000	No
Allianz	Market-consistent	1,000 (5,000 in Germany)	Yes
Aviva	Market-consistent	At least 1,000	Yes
AXA	Market-consistent	At least 1,000	Yes
CNP	Market-consistent	1,000	Yes
Generali	Market-consistent	1,000	Yes
Hannover Re	Market-consistent	1,000	Not disclosed
Legal & General	Real world	Not disclosed	Not disclosed
Lloyds TSB	Market-consistent	Not disclosed	Not disclosed
Mapfre	Market-consistent	2,000	No
Munich Re	Market-consistent	1,000	Yes
Prudential	Both	Not disclosed	Yes
SCOR	Market-consistent	Not disclosed	Not disclosed
Standard Life	Market-consistent	Not disclosed	Yes
Swiss Re	Market-consistent	Not disclosed	Not disclosed
Talanx	Market-consistent	1,000	Yes
ZIG	Market-consistent	1,000	Yes
<b>Other Companies</b>			
Achmea	Not disclosed	Not disclosed	Not disclosed
Baloise	Market-consistent	1,000 - 5,000	Yes
Chesnara	Market-consistent*	Not disclosed	Not disclosed
Mediolanum	Market-consistent	1,000	Not disclosed
Old Mutual	Market-consistent	Not disclosed	Yes
Phoenix	Market-consistent	Not disclosed	Yes
PZU	Market-consistent	1,000	Not disclosed
Resolution (Friends)	Market-consistent	2,000	No
Royal London	Market-consistent	Not disclosed	Not disclosed
St James's Place	N/A**	N/A	N/A
Storebrand	Market-consistent	1,000	No
Swiss Life	Market-consistent	2,000	Yes
Uniqa	Market-consistent	At least 1,000	No
VIG	Not disclosed	Not disclosed	Yes

\*Market consistent with approximations.

\*\*St James's Place does not offer products that carry any significant financial guarantees or options.

## DISCLOSURES

Individual differences in the interpretation and approach to embedded value reporting still remain, even where EEV Principles or MCEV Principles are adopted. Such disparities continue to present challenges for companies, investors, analysts, and other interested parties alike in understanding disclosures and adjusting results to fairly evaluate and compare companies on a consistent basis. Naturally, this environment has put more emphasis on the additional information companies provide to help more clearly identify the dynamics of the business and the value-creation strengths of business models and strategies.

In certain areas, companies differ in the level of detail provided and this also presents challenges for market observers in carrying out in-depth comparisons between companies. On average, those companies producing stand-alone embedded value reports devoted approximately 33 pages to embedded value compared with an average of approximately 17 pages for those companies including embedded value in only their annual reports. Whilst this is a crude comparison, it is indicative of the different amount and granularity of information that companies publish.

The EEV and MCEV Principles prescribe the minimum disclosures regarding methodologies and presentation of results. The MCEV Principles specify the format of the results presentation in Appendix A (*Presentation of analysis of earnings*) and Appendix B (*Group MCEV analysis of earnings*). Appendix A specifies the breakdown of the analysis of movement in embedded value split by distinct components of value (free surplus, required capital, and the value of in-force). Appendix B specifies that covered and non-covered business should be separately presented. The MCEV Principles indicate that the non-covered business should be based, as far as possible, on the unadjusted IFRS net asset values (in practice, however, various adjustments will be required to ensure consistency).

The majority of companies stating compliance with the MCEV Principles in our sample presented their analyses of change broadly in line with Appendix A. There were also a number of EEV-compliant companies that chose to present their results consistent with Appendix A and Appendix B.

Although not required under either EEV or MCEV Principles, an interesting insight into companies' performances can be gained if they disclose the economic variance divided into: 1) the effect brought about by experience being different to that assumed at the beginning of the previous reporting period; and 2) the impact of changed economic assumptions used in the projections. This can aid understanding of the quality of the models used and whether positive or negative variances are due to events that have already occurred or are related to expectations about future market behaviour. At year-end 2014, only around a quarter of the companies included in this study disclosed economic variances divided into these separate components.

The EEV and MCEV Principles specify the minimum sensitivities that companies should disclose and this has helped to standardise disclosures across companies. The EEV and MCEV Principles also encourage companies to provide the results of additional sensitivities to help observers better understand the underlying dynamics of the company's business. Some companies continued to provide additional sensitivities surrounding the impact of the liquidity premium, which included removal of the liquidity premium and a 10 bps increase to it. Munich Re continued to include Solvency II yield curve sensitivity in its disclosure.

With the Solvency II regulation coming into force in 2016, the companies' approach to EEV disclosures might change as they may start focussing on the substantial disclosures required by the Solvency II regime. Over the coming year the necessity for further developments and guidance with regard to embedded value will be paramount as we move closer to the start of the Solvency II regime; no new guidance or press releases regarding embedded value reporting have been disclosed by the CFO Forum since the previous year-end.

An equivalent approach to calculating the embedded value is to use the 'balance sheet approach', where a comparison of the market value of assets with the market value of liabilities is carried out, instead of discounting the future releases of prudent reserving margins. The industry standard approach currently appears to be the discounted profits method. However, the balance sheet approach may become more relevant for comparison purposes when the Solvency II balance sheet comes into force. For example, Achmea, which applied the balance sheet approach to embedded value in the past, in 2014 used the Solvency II process for embedded value calculations.

Embedded values continue to provide rating agencies with valuable information in their assessments of the creditworthiness of firms. The return on embedded value is a useful indication of the company's profitability. Furthermore, additional disclosures and the component nature with which the analysis is presented assist rating agencies in drilling down into the underlying key risk drivers and the areas of the company that are most important and/or where the ability to generate value is most at risk and thus the company's ultimate creditworthiness. Standard & Poor's states that return on embedded value is one of the factors considered in determining life insurers' ratings.

Overall, companies appear to have continued to take steps to align methodologies across their current (and expected) reporting metrics and we expect this alignment to continue.

## OTHER MEASURES OF VALUE

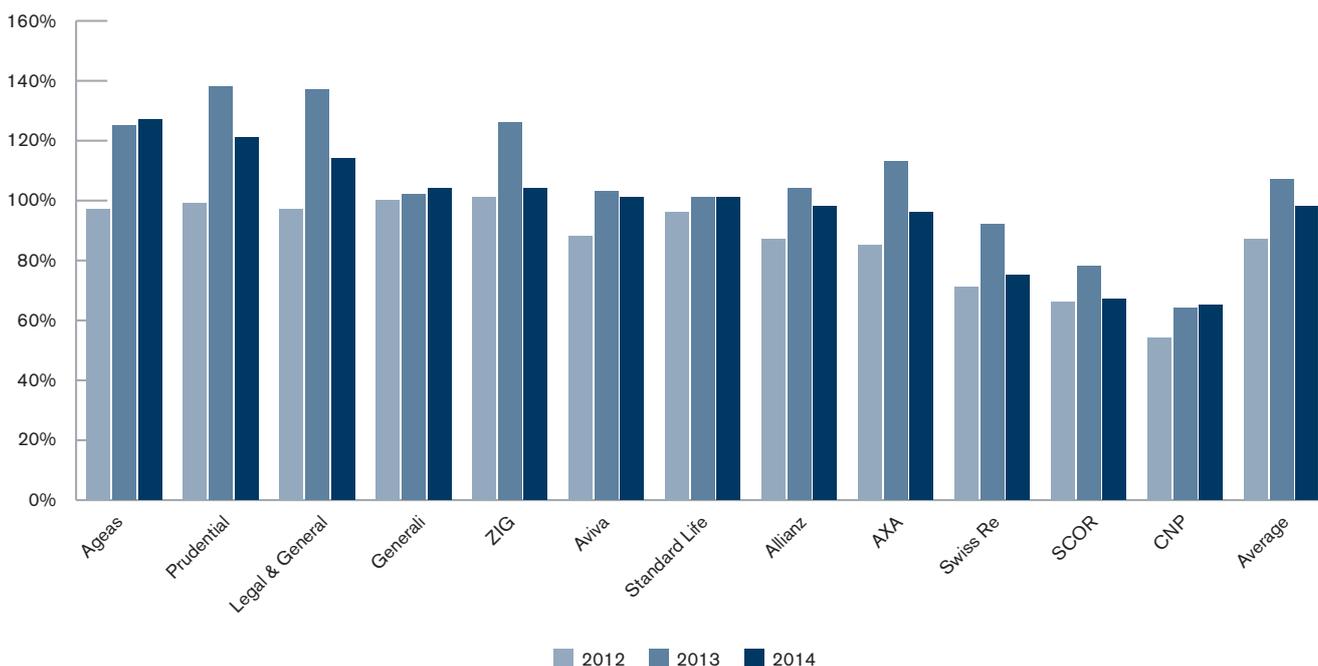
In this final section, we discuss how the results from embedded values compare and contrast with other metrics used by parties such as investors or market analysts. In particular, we consider first how embedded value compares to market capitalisation and then how developments in both Solvency II and IFRS reporting may impact embedded value reporting going forward.

### Market Capitalisation

The acid test of embedded value has always been how much the market believes the result. One simplistic way of measuring this is to compare a company's market capitalisation to its embedded value at a given point in time. However, discrepancies in the embedded value and the market capitalisation can be due to a number of reasons whose impact may not always be entirely clear. For example, no allowance is made within a company's embedded value calculation for future new business sales or for intangible assets such as the loyalty of a customer base, which may be factors investors consider and hence should be reflected within the market capitalisation. This may suggest that, as long as these items are thought to create value, market capitalisation should exceed the reported embedded value. Another reason for discrepancies may be timing differences between the availability of embedded value and market data.

Figure 12 shows the market capitalisation as a percentage of the embedded value for current CFO Forum members as at 31 December 2012 to 31 December 2014.

**FIGURE 12: MARKET CAPITALISATION AS PERCENTAGE OF EMBEDDED VALUE AS AT 31 DECEMBER 2014, 2013, AND 2012**



- Notes:
1. Excludes Lloyds Banking Group, Hannover Re, Talanx, Mapfre, and Munich Re. A comparison of their embedded values do not contain all the business within the group.
  2. Market capitalisation has been sourced from Bloomberg for the last trading day of 2014, 2013, and 2012, except for SCOR whose market capitalisation has been sourced from its annual report.
  3. Ageas' embedded value is the total of 'life' and 'non-life & other insurance'.

The average ratio of the market capitalisation to the embedded value decreased over the last year, indicating lower equity performance. Overall, the individual ratios were closer to 100% than in previous years. More than half of the companies exhibited ratios within the range of 95% to 105%, i.e., had market capitalisations close to their embedded values. Only three companies exhibited a ratio in excess of 110%, compared with 40% of companies being in that category at the end of 2013.

In 2014, about half of the companies exhibited growth in their market capitalisations, with the rest largely staying at the last year's level. The latest market capitalisation figures may be an indication of lower market confidence in the insurance industry.

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## Solvency II

Over 2014 and the first half of 2015, a number of important details affecting Solvency II became clearer prior to implementation on 1 January 2016. A key area of focus for life insurers are the Long-Term Guarantee measures:

- Matching adjustment
- Volatility adjustment
- Risk-free discount rates

The MA is applied as an increase to the Solvency II discount rate and aims to reduce artificial volatility created by spread movements in portfolios where assets are held to maturity. The MA is specified as the spread on eligible assets over and above a 'Fundamental Spread', the latter aiming to capture the element of the overall spread that can be attributed to default risk. Starting as at 31 December 2014, Fundamental Spreads have been published monthly by EIOPA. The use of the MA is subject to regulatory approval, and in the UK the Prudential Regulation Authority (PRA) has published a number of documents outlining the expected contents of the application, including quantitative tests to demonstrate ongoing asset liability matching.

The MA has the following features:

- The Fundamental Spread is floored at 35% of the long-term average spread for corporate bonds and 30% of the long-term average spread for government bonds.
- The calibration of the Fundamental Spread has been more prudent than many in the industry expected, and so the benefit of the MA has been lower than expected.
- The MA can only be applied where the cash flows provided by the assets are fixed and contain no issuer options. However, assets with 'make-whole' clauses, under which the borrower must make an additional payment on early redemption in order to indemnify the lender for the loss of future income, are now in scope. In the UK, the PRA has allowed callable bonds within MA portfolios if the assumed cash flows are coupons up to first redemption date, no coupons subsequently, and principal repaid at the latest possible redemption date. Because this cash flow pattern is very unlikely to be realised, it is unclear to us if it is a suitable assumption for managing asset liability matching.
- Lower-rated assets may be held within the MA portfolio, although the benefit that can be taken for assets rated below BBB cannot exceed that of assets of similar grades.

A key requirement of the MA application is that the MA portfolio must be ring-fenced from the rest of the business, with, for standard formula companies, a resulting loss of diversification benefit in the Solvency Capital Requirement (SCR) calculation. If there is suitable justification, internal model<sup>10</sup> companies may allow for some diversification between the MA portfolio and other business.

The VA's purpose is to dampen the impact of short-term market volatility on portfolios other than those subject to the MA and is specified as an increase to the Solvency II discount rate. Unlike the MA, the VA is not determined based on the actual holdings of an insurer. Instead, EIOPA calculates the VA based on reference portfolios representing typical asset mixes by currency and country. In the UK, a specific area of industry feedback has been the reference portfolio use—it contains a material proportion of equity investments, which lowers the level of the VA. The VA is calculated as 65% of the risk-adjusted spread on each reference portfolio, with additional allowance made when excess spreads in a particular country are significant. In some territories, use of the VA is automatic, whereas in others it is subject to regulatory approval.

Based on our study, companies started aligning their risk-free curves with Solvency II and some companies adopted these approaches (MA or VA) for their embedded value calculations. A significant proportion of companies reported sensitivities with respect to the liquidity premium, while Munich Re continued to not apply any yield curve adjustments but published a Solvency II yield curve sensitivity which covered VA, CRA, and extrapolation of the yield curve in line with the final Solvency II guidelines.

The TSPP confirmed that the adjustment for credit risk, when determining the risk-free rate, should vary according to market conditions (with a cap at 35 bps and a floor at 10 bps). Five companies in this study used CRA in their embedded value methodologies in 2014.

The same companies as last year continued to use extrapolation methodology in line with the latest Solvency II guidelines, with the addition of Storebrand.

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<sup>10</sup> Companies opting (and approval given by the relevant regulator) to use a model specifically designed and calibrated to their specific risk profile to calculate their SCR, rather than the standard formula.

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Throughout 2013, 2014, and 2015, EIOPA has published guidelines and standards which aim to ensure regulators and firms take active steps toward implementing certain key elements of Solvency II in a consistent and convergent way. The guidelines and standards have covered a number of areas, such as:

- System of governance
- Own Risk and Solvency Assessment (ORSA)
- Submission of information
- Internal model pre-application
- MA pre-application
- Reporting

All firms were expected to produce two ORSAs during the preparatory period (referred to as 'Forward Looking Assessments of Own Risk' in the Interim Measures guidelines), one in 2014 and one in 2015. The majority of firms were also required to submit a set of quantitative Solvency II figures in Q2 2015 based on a valuation date of 31 December 2014. Firms have therefore been establishing processes to provide Solvency II balance sheet reporting during 2014 and 2015.

Companies and users of companies' accounts would ideally prefer Solvency II and embedded value reporting to converge as far as possible so that common assumptions and calculations can be used. However, it remains to be seen how achievable this will be, given that the two methodologies are intended to be used for different purposes and will ultimately depend on whether additional margins of prudence are imposed under the Solvency II regime.

The key areas where differences may apply are similar to those highlighted at the end of 2013 and include:

- Investment return assumptions and discount rates (e.g., MA/VA/liquidity premium, allowance for sovereign debt and extrapolation)
- Contract boundaries and consideration of what constitutes new business
- Market-related cost of capital versus the fixed Solvency II risk margin calculation

## IFRS Developments

The preparation of accounts on an IFRS basis gives rise to a different interpretation and timing of profit and loss compared with the embedded value bases. This is fundamentally due to IFRS focusing on a current view of assets and liabilities together with current profit generation compared with embedded value, which also makes allowance for future earnings and the shareholder value created. Reconciliation of these different measures helps to reveal different features of firms' underlying performances. Consequently, companies reconcile the embedded value shareholder net worth to the IFRS net asset value. It is also worth noting that assets under embedded value are at market value whereas, under current IFRS reporting requirements, assets can be held at market value or amortised cost.

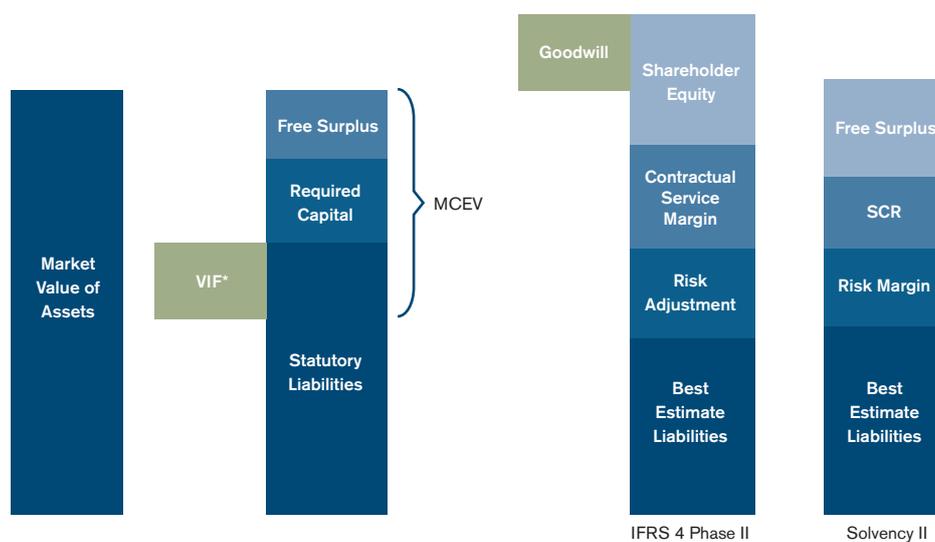
The IFRS 4 Phase II project aims at further standardising international accounting requirements for insurance contracts. The publication (in June 2013) of an Exposure Draft on reporting for insurance contracts by the IASB was a significant milestone toward this goal. The IASB Board has been considering the feedback on the Exposure Draft and has made a number of tentative decisions as to the shape of the final standard. A sticking point has been participating contracts – the proposals in the Exposure Draft were not well received by the European insurance industry, and progress toward an alternative has been slow.

In light of this, the timetable for the final standard has potentially been delayed – the final standard will not be published earlier than 2016. Mandatory implementation is likely to be three years after the publication of the standard.

In contrast, in the United States, the Financial Accounting Standards Board (FASB) decided to limit the scope of its insurance project to insurance entities as described in existing US Generally Accepted Accounting Principles (GAAP). The FASB also decided that the project should focus on making targeted improvements to existing US GAAP. For short-duration contracts, the FASB decided to limit the targeted improvements to enhancing disclosures.

The proposed IFRS 4 Phase II balance sheet, based on the IASB Exposure Draft, is compared with MCEV and Solvency II in Figure 13.

**FIGURE 13: COMPARISON OF MCEV AND PROPOSED IFRS PHASE II BALANCE SHEET**



Notes:

\* VIF is PVFP less TVOG, CoC, and CRNHR.

\*\* Size of components under each reporting metric is for illustration only.

Over 2014, embedded value continued to be viewed as an important metric to showcase firms' financial performances and their business strategies to investors, analysts, and customers. Improvements in overall embedded value results were more modest than in 2013, indicative of challenging economic conditions and the low interest rate environment. Whilst the developments in embedded value reporting have somewhat stagnated (which is due to the focus on preparations for Solvency II and IFRS reporting), firms have still looked to review and incorporate the materially stable aspects of these other reporting metrics. It is likely that 2015 will see some active developments in embedded value reporting, following finalisation of Solvency II. Companies may continue to align their embedded value methodologies with Solvency II. On the other hand, the existence of features in Solvency II that are not market-consistent, such as the VA, MA, and transitional measures which will last for 16 years, might mean the desire to keep reporting market-consistent embedded values will remain unchanged.

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