

MILLIMAN RESEARCH REPORT

2016 Embedded Value Results: Europe

Value Reporting: In Transition

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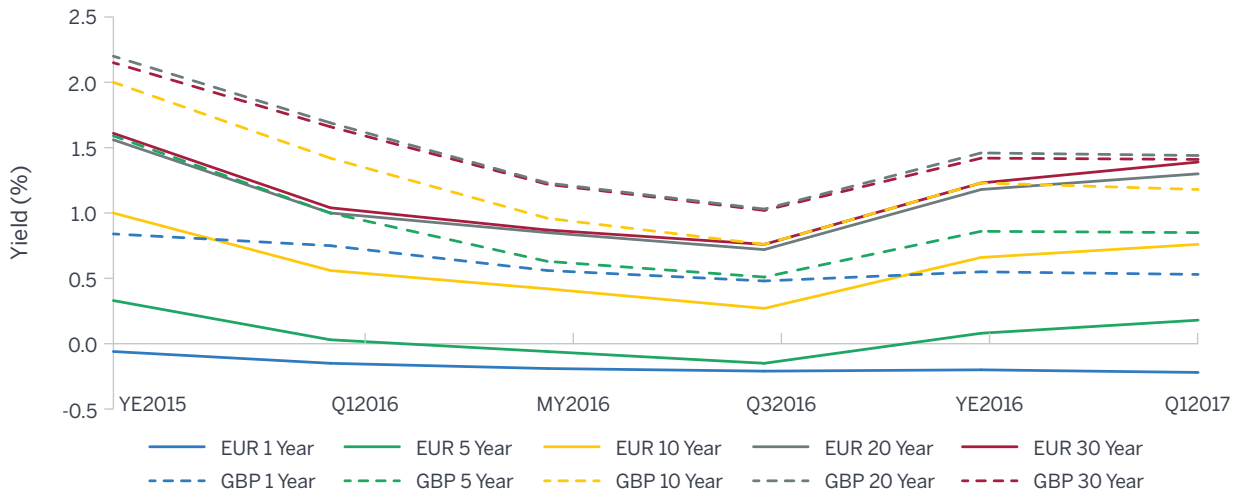
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Executive summary

BACKGROUND

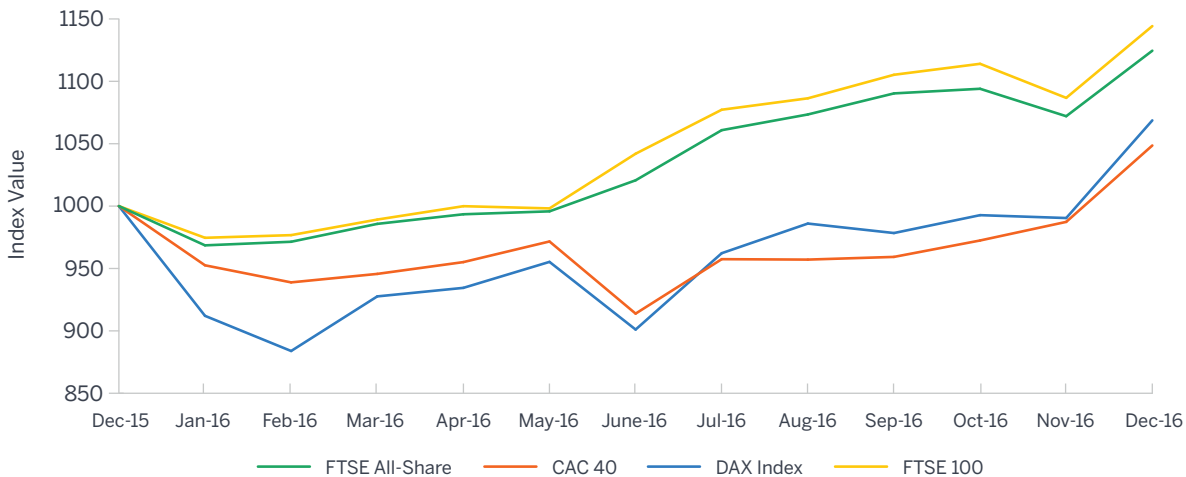
- Owing in part to a number of uncertain political outcomes, 2016 was a year with increased market volatility. Interest rates continued to decline over the first three quarters of the year, although showed some signs of recovery in the last quarter of 2016 and into the first quarter of 2017. This was accompanied by limited growth in equity markets during the first half of 2016, but with a steady improvement in growth from July 2016 which has continued into 2017.

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 2015.

- These market conditions have continued to negatively impact companies' operations and results. Despite this, many companies have been able to sustain their operating returns.
- In May 2016, an amendment was issued to the European Insurance CFO Forum Market Consistent Embedded Value Principles¹ (the MCEV Principles¹). This amendment permits, but does not require, the use of the projection methods and assumptions for market consistent solvency regimes (e.g. Solvency II) in embedded value (EV) reporting. This

1 Copyright[®] Stichting CFO Forum Foundation 2008.

change has allowed companies to fully align the methodology and presentation of results between Solvency II and embedded value, and to use Solvency II Own Funds as the market consistent embedded value measure.

- In light of this, during 2016, companies continued to change their approaches, with a continued trend to align EV reporting and Solvency II reporting further. For example, companies continued to align risk-free rates used with the curves published by the European Insurance and Occupational Pensions Authority (EIOPA) and some companies updated their contract boundary definitions to be consistent with Solvency II.
- On the other hand, a number of companies discontinued EV reporting, citing that the new Solvency II regime is a market consistent framework that incorporates best estimate cash flows for assets and liabilities. Some companies started using new metrics for shareholders' value, based on Solvency II Own Funds, adjusted for certain features (e.g. contract boundaries, cost of capital, ring-fenced funds restrictions and matching adjustment application restrictions) which are considered by the companies producing these metrics as not being consistent with their economic views.

EV RESULTS

- Fewer companies have published full embedded value reports compared with last year; the number of companies included in this study has fallen from 23 to 19. Of those companies that did publish results, more companies adopted Solvency II based reporting of shareholder value this year compared with 2015; with Aviva, AXA, Legal & General and Chesnara adopting various forms of shareholder value reporting based on the Solvency II methodology.
- The CFO Forum members disclosing their embedded values at the end of 2016 (of which there were nine companies) had a combined embedded value of GBP 263 billion (EUR 308 billion) at the end of 2016 compared with GBP 246 billion (EUR 288 billion) at the end of 2015 (where 12 companies disclosed their results). Experience amongst the companies studied was mixed, with around half of companies experiencing an increase in embedded value compared with 2015. Four companies saw a decrease in their group embedded value.
- As was the case in 2015, Allianz, AXA and Prudential take the top three positions in terms of the largest combined business embedded values in 2016. The top performers based on percentage increase in embedded value since 2015 were Legal & General, Prudential and AXA.

NEW BUSINESS RESULTS

- Value of new business (VNB) is perceived as an important metric by the market, and one lacking in the Solvency II disclosures. Some companies have chosen to still disclose VNB despite discontinuing full embedded value reporting. Other companies have chosen to use a different basis for the total shareholder value and value added by new business.
- Overall, results for new business were fairly positive for the majority of companies in our sample. The total VNB written by the current CFO Forum members (that disclosed their values of new business at the end of 2016) was GBP 11.3 billion (EUR 13.3 billion) in 2016, compared like-for-like with GBP 10.1 billion (EUR 11.9 billion) in 2015.

METHODOLOGY CHANGES

- Based on our analysis of companies' embedded value methodologies, evolving practices and emerging market trends, including the convergence between EV and Solvency II methodologies, continue in the following areas: 1) the risk-free rates, 2) the allowance for cost of capital (CoC) including the cost of residual non-hedgeable risks (CRNHR) and 3) recognising the time value of options and guarantees (TVOG).

Risk-free rates

- At 2016 year-end, the majority of firms within our survey are more or less fully aligned with Solvency II when setting their risk-free rates. Some companies adopted slight divergences from this, for example slightly tweaking the extrapolation parameters used, or using their own asset portfolio instead of the reference portfolio provided by EIOPA when applying the volatility adjustment to the risk-free curve.
- It was anticipated that companies would adopt the use of matching adjustment (MA) for their embedded value reporting once they receive MA approvals, but a number of companies continued to prefer to apply a volatility adjustment (VA) this year.

Cost of capital/cost of residual non-hedgeable risks

- As at year-end 2016, most companies set their required capital with reference to local regulatory requirements. However, some companies set their required capital with reference to different bases; for example one company set its required capital with reference to Solvency II Pillar 2 capital requirements (when the company falls under the Solvency II regime).
- Increasingly companies that have aligned their MCEV balance sheets with the Solvency II balance sheets have not explicitly held any further allowance for frictional costs of required capital than already included in the calculations.
- Further alignment between EV and Solvency II methodologies, has led to companies aligning their CRNHR with the Solvency II risk margin.
- A larger proportion of companies included in our survey are using CoC charges of 6% than in 2015. The increase is due in part to the movement to a Solvency II based approach to embedded value by some companies. However, a 6% CoC charge is considered by many in the industry to be too high and hence the majority of companies in our study have chosen to use a lower rate.

Time value of options and guarantees

- In general, market consistent approaches were used to value options and guarantees.
- A further decrease in interest rates since 2015 has forced companies to reconsider their interest rate models, leading to the majority of companies changing their approach moving away from lognormal relative volatilities to normal absolute volatilities.

DISCLOSURES

- In general, disclosures as part of EV reporting reduced during 2016. This is in part due to updated 2016 MCEV Principles and Guidance, which made fewer EV components compulsory disclosures, and in part to more firms moving to new shareholder value reporting metrics given the introduction of Solvency II.
- The reduced disclosure is demonstrated in that some firms produced shorter reports, the number of firms having their EV results audited reduced, and some firms reported sensitivities other than those required by the MCEV Principles.
- It was also found that companies had removed disclosures relating to the value of new business, value of in-force (VIF) emergence and in the description of their methodologies.
- With the move by many firms towards Solvency II as a basis for shareholder value reporting some might see the Solvency and Financial Condition Report (SFCR) as supplying some of the information that used to be in EV disclosures. However, the SFCR does not contain information around new business or analysis of change.

OTHER MEASURES OF VALUE

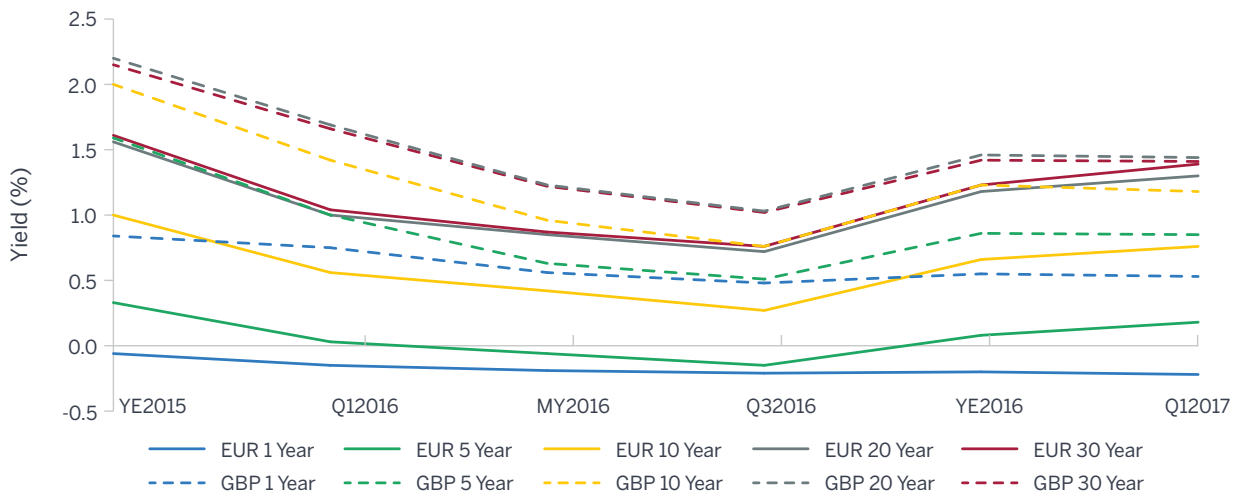
- Market capitalisations varied considerably when compared with embedded values, with ratios ranging from 61% to 182%. However, more companies had embedded values which were close to their market capitalisations this year, with five companies being in the range of 90% to 110%, compared with only two companies in 2015.
- On 18 May 2017 the International Accounting Standards Board published its new standard on accounting for insurance contracts: IFRS 17. The Standard's aims are consistent accounting for all insurance contracts, increased transparency in financial information reported by insurance companies and reported information based on current estimates. Subject to EU endorsement, the Standard will apply for accounting periods starting on or after 1 January 2021.
- In summary, the principle-based Standard requires an assessment of the profitability of groups of insurance contracts when they are first issued and, if positive, recognition of that value (the contractual service margin or CSM) over the lifetime of the contracts in a manner that reflects the timing of the insurance services being provided by the insurer. The preparation of accounts under IFRS 17 gives rise to a different interpretation and timing of profit and loss compared with an EV basis.
- IFRS 17 disclosure requirements are substantial, and it is expected that it will allow interested parties—investors, market analysts—to obtain a sufficient amount of information about the profitability of the business. Time will tell whether companies use Solvency II or IFRS 17 as the reference point for MCEV.

Introduction

Owing in part to a number of uncertain political outcomes, 2016 was a year with increased market volatility. The UK referendum on EU membership in June yielded a vote to leave the EU and then the US presidential election in November 2016 led to Donald Trump’s inauguration as president. The uncertainty around the outcomes of these influential political events only served to augment what were already challenging market conditions.

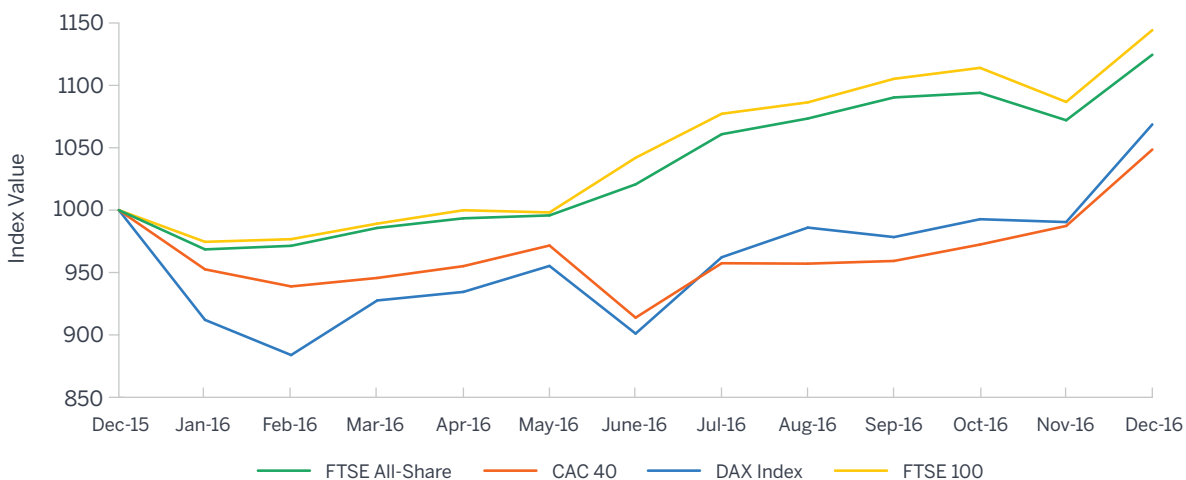
Interest rates continued to decline over the first three quarters of the year, but have showed some signs of recovery in the last quarter of 2016 and into the first quarter of 2017 (see Figure 1); although they still stayed lower than the average over 2015 for each respective duration. The extreme conditions of negative interest rates prevailed at short durations for the euro, affecting more than just the 1-year rate as the 5-year rate went negative for the first time in the last few years. This was accompanied by limited growth in equity markets during the first half of 2016, but with a steady improvement in growth from July 2016 which has continued into 2017 (see Figure 2). In particular, whilst the FTSE 100 and FTSE All-Share indices have steadily increased over the year, the CAC 40 and DAX Index have shown comparatively more volatility but still ended the year in a position of growth. Recently, the FTSE 100 index has broken through 7,500 (equivalent to around 1,200 using the scale in Figure 2) for the first time in its 33-year history, buoyed by a weaker pound and strong UK inflation figures.

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 2015.

More generally, the persistent low interest rate environment observed over the last few years and increased volatility continues to negatively impact companies' operations and results. Despite these continuing challenging conditions, many companies have been able to sustain their operating returns. For example, many companies commented that VNB has been maintained, or even increased, compared with 2016. This is as a result of steering new business sales towards more profitable and capital efficient business mixes through the implementation of various management actions. Examples include: withdrawing from certain markets (e.g. the bulk annuity market), repricing or redesigning existing products or launching new products.

The comparison between market capitalisation and embedded value has slightly worsened, with the average market capitalisation as a percentage of total embedded value decreasing from 108% at the end of 2015 to 101% at the end of 2016 (see Figure 9). However, individual firms' results do vary. Zurich and CNP both show relatively large improvements although they are overshadowed by the majority of other firms which have witnessed declines.

In May 2016, the European Insurance CFO Forum issued an amendment to the European Embedded Value (EEV) and MCEV Principles. This amendment permits, but does not require, the use of the projection methods and assumptions for market consistent solvency regimes (e.g. Solvency II) in future embedded value reporting. This allows firms to align the assumptions used between the reporting measures, if they wish to do so. Whilst this does not compel companies to align the assumptions, as anticipated it has led to convergence between embedded value and Solvency II reporting measures and this trend is expected to continue. The majority of companies aligned their risk-free rates with the Solvency II risk-free yield curves. Some companies have completely aligned their shareholder value reporting with the Solvency II Own Funds, and some used it as a basis for their shareholder value reporting, adjusting for the features of the Solvency II regime viewed as not consistent with an economic value viewpoint, for example, such as contract boundaries, cost of capital and restrictions on the matching adjustment application.

In this publication, we focus on embedded value results as at year-end 2016 and have provided an overview of companies' results and methodologies, covering changes in methodologies that companies have adopted in the post-Solvency II world.

Appendix 1 covers a high-level overview of some of the key components of an embedded value calculation.

Embedded value approaches

In May 2016 the CFO Forum issued revised EEV and MCEV Principles and Guidance, updated for the Solvency II regime which came into force on 1 January 2016. The CFO Forum noted that there are similarities between the methodology and assumptions used to determine the Solvency II balance sheet and those employed under embedded value reporting, and that alignment of methodology and assumptions between Solvency II and EV may be beneficial for companies that report under one of these approaches.

Overall, the changes allow companies to fully align the methodology and presentation of results between Solvency II and embedded value, and use Solvency II Own Funds as the market consistent embedded value measure.

The most significant change has been with regard to disclosures, where many of the mandatory disclosures under the previous version of the principles are no longer compulsory but now serve as an example of what can be disclosed.

During 2016 companies continued to change their approaches, adopting the updated Principles and Guidance, with a clear trend to align EV reporting and Solvency II reporting further. Companies allowed for the change in the regulatory regime, continued to align risk-free rates used with the curves published by EIOPA and some companies updated their contract boundary definitions to be consistent with Solvency II. A number of companies discontinued EV reporting, citing that the new Solvency II regime is a market consistent framework that incorporates best estimate cash flows for assets and liabilities. Some companies started using new metrics for shareholders' value, based on Solvency II Own Funds, adjusted for certain features (e.g. contract boundaries, CoC, ring-fenced funds restrictions, and matching adjustment application restrictions) which are considered by the companies producing these metrics as not being consistent with their economic views.

The breakdown of the number of companies from our sample of 19 using the EEV, market consistent EEV², and MCEV Principles is shown in Figure 3. A new category, 'Solvency II based', was added last year to reflect the trend of companies aligning their embedded value reporting with the Solvency II regime. Companies under this category include both those formally complying with CFO Forum Principles, and those producing Solvency II based shareholder value metrics as a replacement to EV reporting. In addition, some companies follow equally valid approaches that do not entirely conform to either the MCEV or EEV Principles or the Solvency II based approach and are captured under the 'Other' category. For example, Swiss Re reports under a basis known as its 'Economic Value Management framework'.

Overall, there is a general tendency to discontinue formal embedded value reporting, as fewer companies have published full embedded value reports compared with last year. Also, there is a clear trend towards market consistent reporting. More companies adopted Solvency II based reporting of shareholder value this year compared with 2015, with Aviva, AXA, Legal & General and Chesnara adopting various forms of shareholder value reporting based on the Solvency II methodology. Of those companies that chose this methodology, only Allianz produced an audited MCEV report stating compliance with MCEV Principles.

FIGURE 3: EMBEDDED VALUE REPORTING PRINCIPLES

EV REPORTING PRINCIPLES	2015			2016		
	CFO FORUM MEMBERS	OTHER COMPANIES	TOTAL	CFO FORUM MEMBERS	OTHER COMPANIES	TOTAL
EEV	1	0	1	0	0	0
Market Consistent EEV	3	3	6	1	2	3
MCEV	6	6	12	3	5	8
Solvency II Based	1	1	2	4	2	6
Other	2	0	2	2	0	2
Total	13	10	23	10	9	19

Notes:

1. Numbers of companies based on a sample of 19 in 2016. Three companies did not disclose their EV results, LBG is excluded in 2016 as they just disclose VIF.
2. Swiss Re do not report explicitly under either EEV or MCEV principles but under a framework called Economic Value Management.
3. Prudential uses market consistent approach for shareholder-backed annuities and EEV Principles for the rest of the business.

² The term 'market consistent EEV' describes a company reporting in compliance with the EEV Principles but on a market consistent basis.

As noted above, the CFO Forum in May 2016 published new EEV and MCEV Principles which permit quite a wide degree of alignment between EV methodology and Solvency II reporting. Companies have continued to adjust to the new Solvency II regime and some have also changed their approaches to EV reporting. Figure 4 outlines companies' approaches to reflecting the impact of Solvency II at 2015 and 2016 year-ends.

FIGURE 4: HOW SOLVENCY II IS REFLECTED IN EMBEDDED VALUE REPORTING YEAR-END 2015 AND 2016

COMPANY	HOW SOLVENCY II IS REFLECTED IN EMBEDDED VALUE REPORTING (YEAR-END 2015)	HOW SOLVENCY II IS REFLECTED IN EMBEDDED VALUE REPORTING (YEAR-END 2016), CHANGES ADDITIONAL TO 2015
CFO FORUM MEMBERS		
Ageas	Reference term structure is in line with valuation parameters set by EIOPA (except HKD).	Required capital is based on Solvency II Pillar 2 capital.
Allianz	Full alignment with Solvency II.	Full alignment with Solvency II.
Aviva	No allowance.	Discontinued EV reporting. VNB is published on MCEV basis and Adjusted Solvency II basis (adjusted for contract boundaries and look-through profits of service companies). From 2017 onwards Adjusted Solvency II basis will replace MCEV VNB metric.
AXA	Transitioned to Solvency II capital requirements at the 2015 year-end, liquidity premia were replaced by volatility adjustment.	New metric introduced, 'Available Financial Resources', which corresponds to the surplus in the Solvency II balance sheet.
CNP	No allowance, additional sensitivity disclosed on the required capital in line with Solvency II requirements.	The use of a Solvency II required capital, alignment of the risk-free rate curve with Solvency II.
Generali	Changes include definition of reference rates and required capital – required capital is based on Solvency II for European Economic Area (EEA) companies and local regulatory capital for non-EEA companies.	Definition of contract boundaries is aligned with Solvency II (for in-force business only, VNB will be reported using this definition from 2017).
Legal & General	No allowance.	Stopped EV reporting. Introduced two new metrics: <ul style="list-style-type: none"> ▪ Solvency II New Business contribution (calculated in a manner consistent with EEV Principles and on the same economic and operating assumptions as would have been used under EEV methodology). ▪ Economic Capital surplus, which represents Solvency II Own Funds adjusted for features of Solvency II viewed as uneconomic (MA restrictions and fungibility restrictions removed).
Prudential	No allowance.	Solvency II regime is reflected in UK operations. The risk-free rate for shareholders' backed annuities is a swap curve plus an allowance for liquidity premium based on the Solvency II allowance for credit risk.
SCOR	No allowance.	EV not disclosed at the time of writing.
Swiss Re		Reflected adoption of Solvency II for UK business.
Talanx	Adoption of CoC rate of 6%.	EV not disclosed at the time of writing.
ZIG	No allowance.	Regulatory balance sheet requirements in the UK and Ireland are aligned to Solvency II. No allowance for Solvency II EIOPA curve made in EV calculations.

FIGURE 4: HOW SOLVENCY II IS REFLECTED IN EMBEDDED VALUE REPORTING YEAR-END 2015 AND 2016 (CONTINUED)

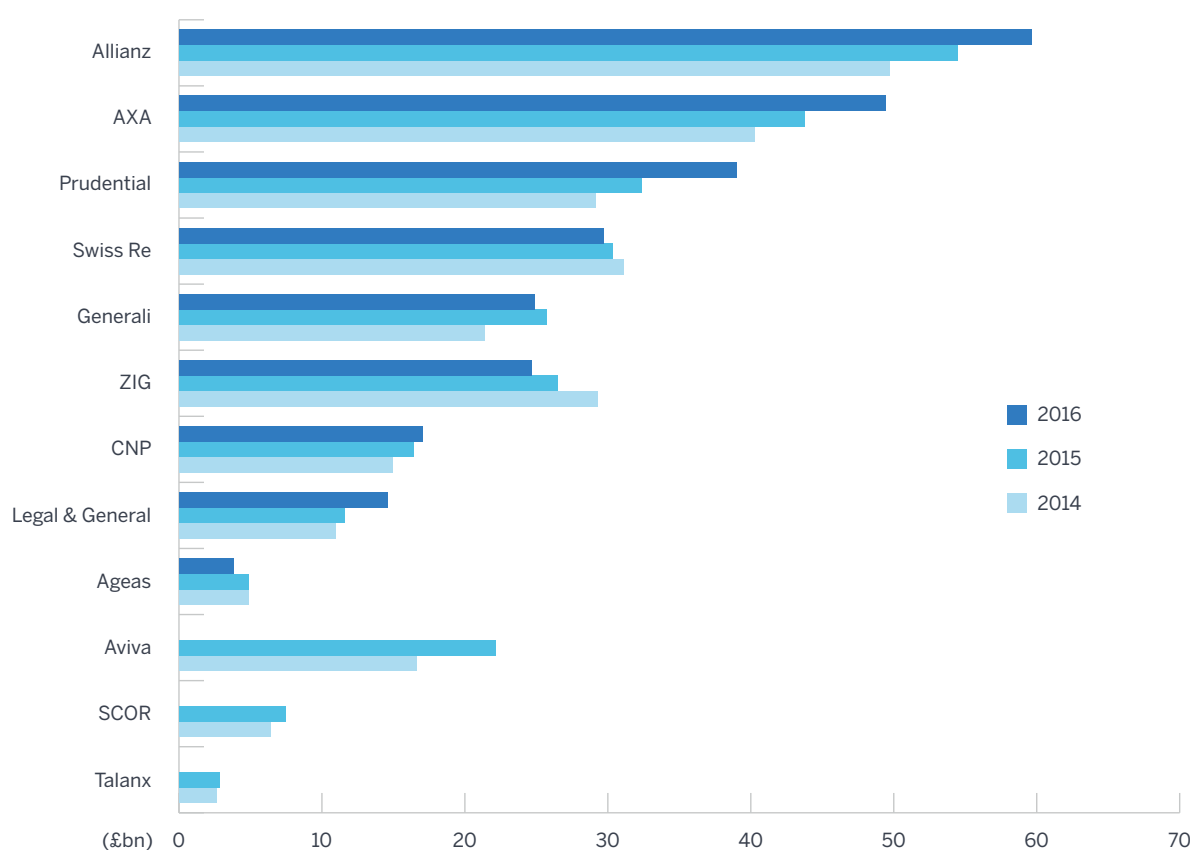
COMPANY	HOW SOLVENCY II IS REFLECTED IN EMBEDDED VALUE REPORTING (YEAR-END 2015)	HOW SOLVENCY II IS REFLECTED IN EMBEDDED VALUE REPORTING (YEAR-END 2016), CHANGES ADDITIONAL TO 2015
OTHER COMPANIES		
Achmea	Convergence to Solvency II, except CoC rate and contract boundaries.	No further changes.
Baloise	Aligned methodology of the reference yield curves with Solvency II, including use of VA.	No further changes.
Chesnara	No allowance.	Discontinued EV reporting, introduced new metric Economic Value (EcV), which is derived from Solvency II Own Funds adjusting for CoC rate (3%), contract boundaries, removing restrictions on ring-fenced funds and dividends are recognised as paid.
Old Mutual	No allowance.	No allowance.
Phoenix	No allowance.	Discontinued EV reporting.
Royal London	No allowance.	PRA's realistic balance sheet continues to be used for EV calculations. The Group has continued to apply the margins of prudence within assumptions and the definition of contract boundaries in a consistent way to the previous realistic regime. EIOPA swap curve is now used instead of a gilt curve. A change in methodology to reserve for reinsurer default.
St James's Place	No allowance.	Change in the required capital methodology: moved away from 100% of Solvency I capital requirement to holding a Management Solvency Buffer over unit-linked liabilities.
Swiss Life	No allowance.	Aligned its definition of the risk-free curves with Solvency II specifications.
Uniqa	The required capital is defined as the solvency required capital less subordinated debt and VIF under the Solvency II regime.	Contract boundaries are aligned with Solvency II. Risk-free rates are in line with EIOPA published rates.
Vienna	The required capital is defined as the solvency required capital less subordinated debt and VIF under the Solvency II regime.	Aligned the MCEV and Solvency II methodologies; frictional CoC and CRNHR are replaced with risk margin; risk-free rates are in line with EIOPA published rates.

Embedded value results

EMBEDDED VALUE

The CFO Forum members disclosing their embedded values at the end of 2016 had a combined embedded value of GBP 263 billion (EUR 308³ billion) at the end of 2016 compared with GBP 246 billion (EUR 288³ billion) at the end of 2015. Figure 5 shows the embedded value results of current CFO Forum members at the last three year-ends.

FIGURE 5: PUBLISHED EMBEDDED VALUE RESULTS OF CFO FORUM MEMBERS AT YEAR-END 2014, 2015 AND 2016



Notes:

1. Where relevant, non-covered business is included at IFRS value.
2. Aviva, SCOR and Talanx did not disclose embedded value results for 2016.
3. Other shareholder value metrics, based on Solvency II Own funds, are included for 2016 results for those companies who replaced their EV reporting with this metric.
4. Past years' EV results are converted to GBP using end year 2016 exchange rate to exclude the effect of exchange rate in the comparison.

Experience amongst the companies studied was mixed, with around half of companies experiencing an increase in embedded value compared with 2015. Four companies saw a decrease in their group embedded value.

The embedded values considered in Figure 5 include both covered and non-covered business. As was the case in 2015, Allianz, AXA and Prudential take the top three positions in terms of the largest combined business embedded values in 2016. The top performers based on percentage increase in embedded value since 2015 were Legal & General, Prudential and AXA.

- Legal & General's shareholder value increased by 26% compared with 2015, making it the top performer as measured by this metric of the companies studied. However, the change cannot be entirely attributed to its financial performance, but is also due to the change in methodology; 2015 results were reported on an EEV basis whilst the 2016 value is an economic capital measure based on adjusted Solvency II Own Funds. The primary adjustment to Solvency II Own Funds is for differences between the Solvency II matching adjustment and the economic matching adjustment (which removes any Solvency II constraints viewed as economically artificial) and also for a different calibration of longevity risk capital. When comparing like with like, Legal & General's adjusted Solvency II Own Funds increased by 7% compared with 2015.

3 As at year-end 2016: GBP 1 = EUR 1.172.

- Prudential's embedded value increased by 20% over the year from GBP 32,359 million at 31 December 2015 to GBP 38,968 million at 31 December 2016. This was driven by strong profits across the business, continued growth of new business and favourable exchange rate movements.
- AXA experienced a 13% increase in embedded value over the year. Again, an increase is largely down to a methodology difference. In 2016, AXA reported shareholder value on an EEV basis and on a metric termed 'Available Financial Resources' (AFR), the surplus from the Solvency II balance sheet. Figure 5 contains the AFR metric for 2016, rather than EEV, as this is the main metric in AXA's report, with analysis of movements and sensitivities reported on an AFR basis. The main differences between AFR and EEV lie in the treatment of dividends, subordinated debts, adjustment to the IFRS value of non-covered business and differences in CRNHR. Group AFR has increased by EUR 1.1 billion to EUR 57.9 billion over 2016 as a result of new business performance, but offset to some extent by economic conditions.

Ageas, ZIG, Generali and Swiss Re experienced falls in their group embedded values over the year:

- Ageas experienced a significant fall of 22% in its embedded value. However, Ageas has restated its 2015 EV due to the divestment of Ageas Asia Holdings with an impact on embedded value of EUR 1,020 million, and to a lesser extent to allow for valuation methodology differences. When comparing current EV with the 2015 restated EV, the fall reduces, decreasing from EUR 4,533 million to EUR 4,487 million (1%).
- Unfavourable changes in exchange rates and capital movements were key drivers behind the 7% fall in ZIG's embedded value.
- Generali saw an increase in its EV before taking into account Solvency II contract boundaries. The application of the Solvency II contract boundaries definition led to a reduction in VIF and a fall in EV compared with the previous year-end.
- Swiss Re's embedded value was fairly stable, experiencing a small 2% reduction.

VALUE OF NEW BUSINESS

As detailed earlier in this report, the Solvency II regime brought a lot of changes to embedded value reporting, including how companies report value of new business. Some companies, such as Aviva and Legal & General, still disclose VNB despite discontinuing full embedded value reporting as VNB is perceived as an important metric by the market, and the one lacking in the Solvency II disclosures.

Aviva reported VNB on both MCEV and adjusted Solvency II Own Funds bases, stating that from 2017 onwards, the adjusted Solvency II VNB will replace MCEV VNB as a key performance indicator. The reported numbers differ significantly between the two measures (GBP 1,352 million on the MCEV basis vs GBP 992 million on the adjusted Solvency II Own Funds basis). The differences between the two measures lie in the CRNHR (which is about one-third of the risk margin), risk adjustments and differences in the underlying economic assumptions.

Legal & General reported its VNB on an EEV (not market consistent) basis, allowing for the changes brought about by the movement to Solvency II. This differs from Legal & General's basis for the total shareholder value which is reported on an adjusted Solvency II Own Funds basis, and so represents a market consistent measure.

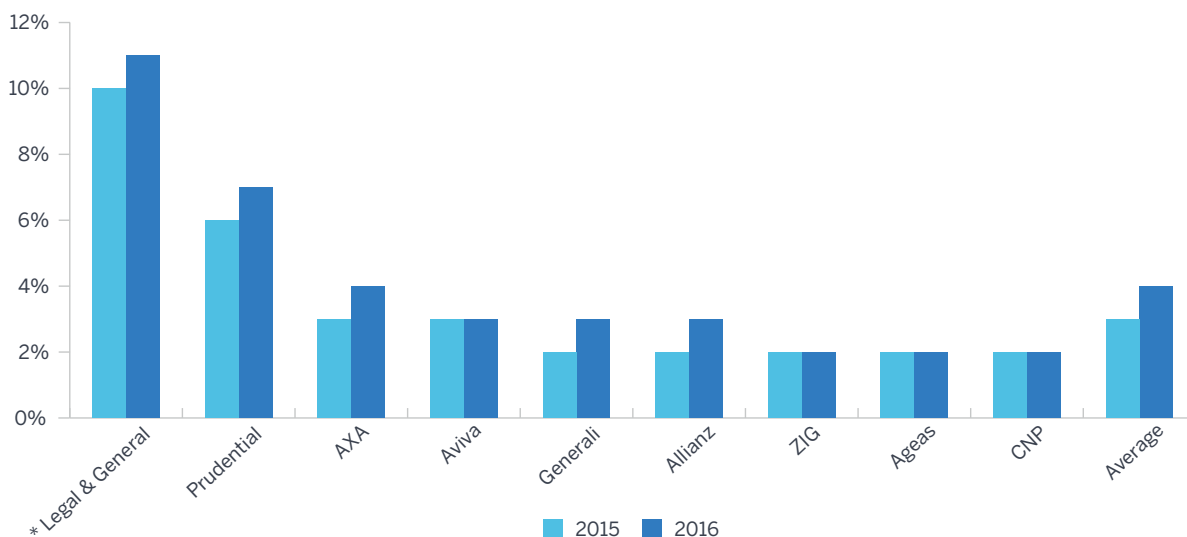
This is not the only example of a firm using a different basis for the total shareholder value and value added by new business, for example, whilst the Solvency II contract boundaries definition is used for AFR by AXA, limitations regarding the boundaries of an insurance contract are not considered for the calculation of the VNB.

Overall, results for new business during 2016 were positive for the majority of companies in our sample. The total VNB written by the current CFO Forum members (that disclosed their values of new business at the end of 2016) was GBP 11.3 billion (EUR 13.3³ billion) in 2016, compared with GBP 10.1 billion (EUR 11.9 billion) in 2015. A variety of reasons were noted by companies for these improved values of new business. They included increased new annuity sales, higher retail sales, favourable exchange rates, a favourable change in long-term interest rates and use of repricing and redesigning of products.

Figure 7 shows the values of new business over the last three years for the CFO Forum members that disclosed their new business results. Prudential, AXA and Allianz took the top three positions in terms of VNB in 2016.

Underlying the VNB results, the average new business margin⁴ for the CFO Forum members increased slightly to 3.6% in 2016 from 3.1% in 2015⁵. Figure 6 shows the new business margin for CFO Forum members that disclosed results in 2016 and 2015. There was an approximate 12.1% increase in new business volumes over 2016.

FIGURE 6: NEW BUSINESS MARGIN FOR CFO FORUM MEMBERS AT YEAR-END 2015 AND 2016



* Legal & General only included selected lines in their analysis for year-end 2016. Figures for year-end 2015 have been adjusted accordingly in order to provide a like-for-like comparison.

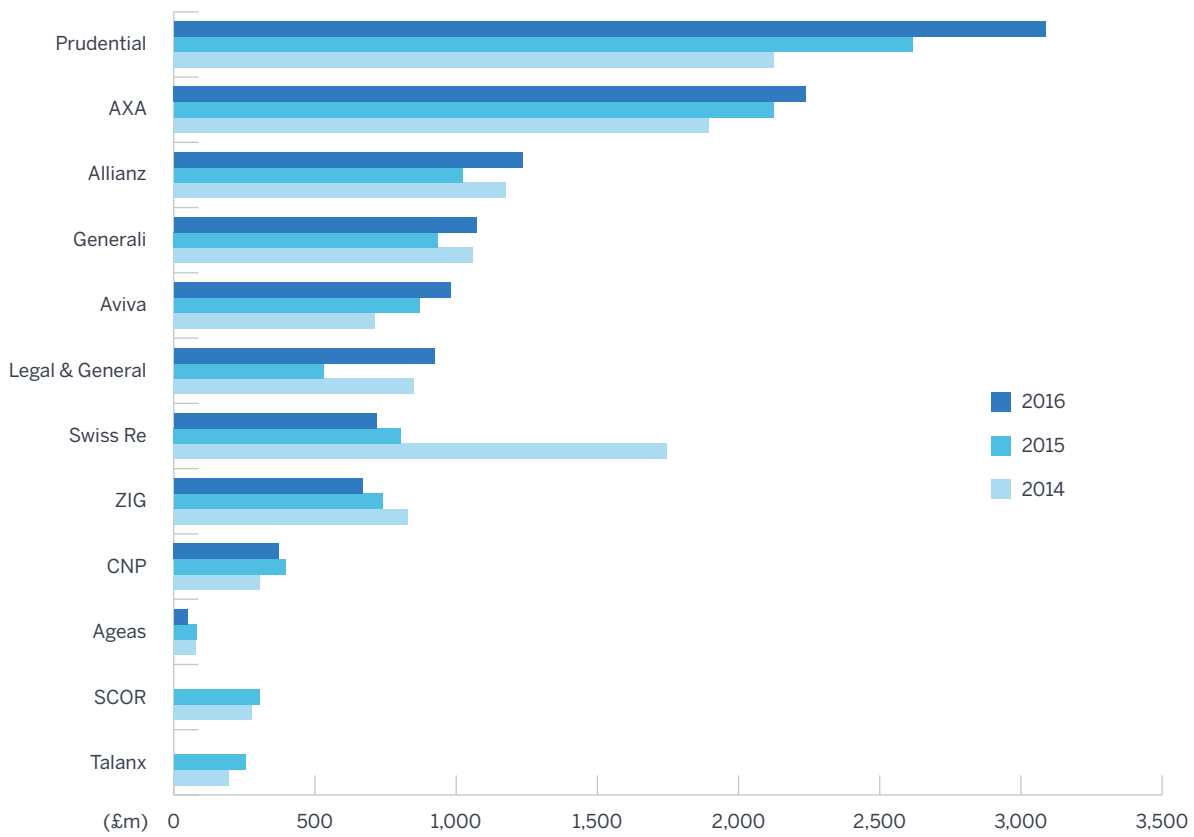
Companies in the CFO Forum experienced a mixture of movements in their VNB. Prudential, Allianz and Legal & General saw VNB increases of more than 17%. The top performer, based on percentage increase in the VNB, was Legal & General which saw a significant 75% increase in VNB in 2016 compared with 2015, primarily driven by an increase in new annuity business volumes, a greater use of longevity reinsurance, an efficient underwriting model and a broad distribution channel. Some companies experienced a decrease in their VNBs, for example Ageas saw its VNB drop by more than 40%. It stated that new business margins for savings products have decreased given the low interest rate environment.

Approximately 60% of the CFO Forum members surveyed saw an increase in their new business volumes.

⁴ Throughout this report, 'new business margin' is defined as the ratio of VNB to the present value of new business premiums.

⁵ This includes companies disclosing their results in 2016 only.

FIGURE 7: PUBLISHED VALUE OF NEW BUSINESS BY CFO FORUM MEMBERS AT YEAR-END 2014, 2015 AND 2016



Notes:

1. SCOR and Talanx did not disclose EEV at the end of 2016.
2. VNB for Aviva is based on published MCEV VNB, adjusted for tax and controlling interests.
3. Swiss Re VNB only includes the value from its underwriting activities.
4. Past years' results are converted to GBP using the year-end 2016 exchange rate to exclude the effects of exchange rate in comparison.

Methodology changes

Based on our analysis of companies' embedded value methodologies, evolving practices and emerging market trends, including the convergence between EV and Solvency II methodologies, continue in the following areas: 1) the risk-free rates, 2) CoC and CRNHR and 3) TVOG. We consider each of these in detail below.

Risk-free rates

At the 2016 year-end, the majority of firms within our survey were more or less fully aligned with Solvency II when setting their risk-free rates, through the use of the risk-free interest rate term structures published by EIOPA, including the extrapolation methodology and the use of a VA.

Some companies slightly tweaked the extrapolation parameters, using their own assessment of the depth, liquidity and transparency of financial markets (which differs from EIOPA's technical specifications), or aligning them with the local regulation, for example Swiss Solvency Test parameters.

There has been a continued trend of companies moving away from the Solvency II QIS5 liquidity premium methodology in favour of aligning their adjustments to risk-free rates under Solvency II, with continuing trend of companies using VA as an adjustment to their risk-free curves. ZIG is the only company left to still use the QIS5 methodology for liquidity premium.

It was anticipated that companies would adopt the use of MA for their embedded value reporting once they receive MA approvals, but most companies continued to prefer to apply a VA this year. Some companies used their own asset portfolio instead of the reference portfolio provided by EIOPA when applying the VA to the risk-free curve for certain currencies. Prudential stated in its report that in the annuity MCEV calculations, as the assets are generally held to maturity to match liabilities, the future cash flows are discounted using the swap yield curve plus an allowance for liquidity premium based on the Solvency II allowance for credit risk. It is not clear from the report whether the MA methodology was used for this adjustment, but in any case it seems to be similar to the MA, if not the MA itself.

Cost of capital

The majority of companies use a frictional cost approach to calculating CoC, which is the approach under the MCEV Principles. However, the definition of required capital differs among companies. As at year-end 2016, most companies disclosed that they set their required capital with reference to local regulatory requirements, which for many of the companies in this study meant that they aligned their required capital definitions with the Solvency II capital requirements (where companies fall under the Solvency II regime). However, some companies set their required capital with reference to different bases, for example one company set its required capital with reference to Solvency II Pillar 2 capital requirements, the Own Risk and Solvency Assessment (ORSA).

The MCEV Principles previously required an explicit allowance for the frictional CoC, but now if companies align their MCEV balance sheets with the Solvency II balance sheets, and if the Solvency II risk margin includes sufficient allowance for the frictional costs of required capital, then no further allowance for frictional costs of required capital is needed. This is the approach increasingly adopted by companies.

Cost of residual non-hedgeable risks

This is another area where there has been a further alignment between EV and Solvency II methodologies, with companies aligning their CRNHR with the Solvency II risk margin.

Figure 8 shows the range of equivalent average CoC charges based on the companies included in our analysis, split by CFO Forum members and other companies. The CoC rate is one of the key subjective areas, where companies use a range of rates, based on their views, whilst the Solvency II regime prescribes the rate of 6% to be used in the risk margin calculations.

FIGURE 8: EQUIVALENT AVERAGE COST OF CAPITAL CHARGE FOR NON-HEDGEABLE RISKS AT YEAR-END 2015 AND 2016

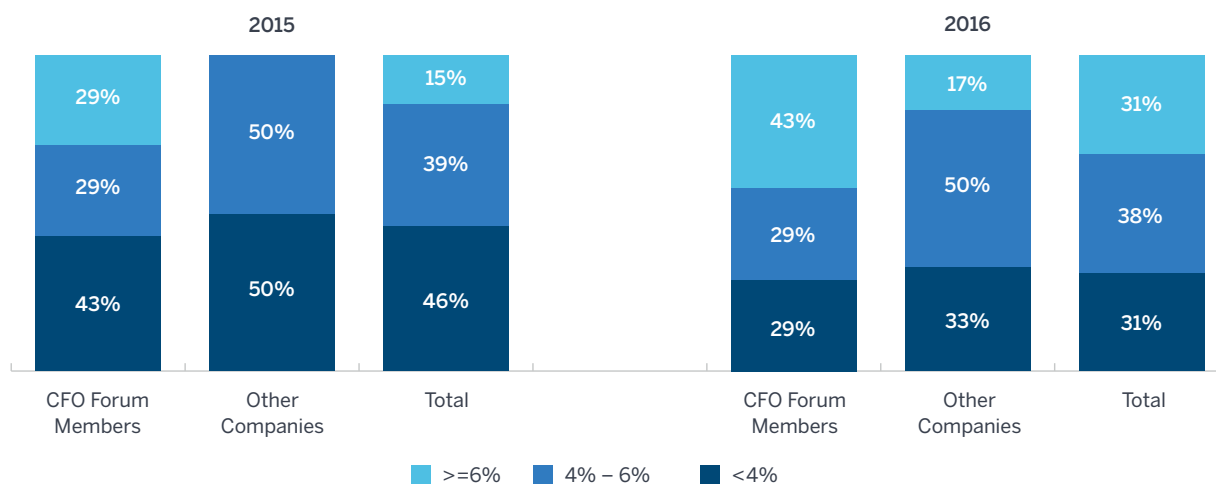


Figure 8 shows that there is a spread of results. The lowest charge was 2% which two companies used, and the highest was 6% which four companies used.

Figure 8 also shows that a larger proportion of companies are using CoC charges of 6% than in 2015. The increase is due in part to the movement to a Solvency II based approach to embedded value by some companies. Under such an approach, companies may use the value of the Solvency II risk margin as a proxy for the CRNHR and hence would be implicitly using a CoC rate of 6%.

However a 6% CoC charge is considered by many in the industry to be too high and hence the majority of companies in our study have chosen to use a lower rate. Chesnara states that it considers 6% to be 'materially' above its realistic view of CoC. Therefore, in its own economic capital calculation (based on adjusted Solvency II Own Funds), it assumes a 3% CoC, which is one of the main adjustments made to its Solvency II Own Funds to arrive at the economic value.

Time value of options and guarantees

Companies disclosing their methodologies continue 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 derived. Furthermore the majority of companies continued to base asset correlations on historical market relationships.

Equity volatilities remained generally at the same level as in 2015 for all currencies. Interest rate volatilities for UK sterling increased significantly for all terms and tenors, potentially reflecting uncertainty around Brexit. US dollar interest rate volatilities slightly decreased for shorter terms and increased for longer terms, whilst the reverse is true for the euro-denominated swaptions volatilities.

As discussed earlier, this year saw a further decrease in interest rates with negative interest rates observed at shorter durations for the euro. Companies need to ensure their ESG models can capture the negative rates, so as not to underestimate the cost of financial options and guarantees. Companies now typically either use normally distributed process interest rate models, or adapt lognormal or chi-square distributed models by introducing 'shift' parameters to allow for negative rates.

Disclosures

The disclosure of supplementary reporting is an area where changes had been expected during 2016 given the general trend of moving away from embedded value reporting to other forms of shareholders' value reporting and significant changes to disclosures requirements in the updated MCEV and EEV Principles.

There are not only fewer firms reporting embedded value results this year, but the level of disclosures by firms that do report embedded value results has also reduced. The number of companies included in this study has fallen from 23 to 19, which includes firms that have stopped embedded value reporting and replaced it with other forms of shareholders' value reporting. Meanwhile the average number of pages in EV reports has reduced from around 28 pages in 2015 to 25 pages in 2016 for those companies which have continued to report embedded value. The reduction is seen in both the granularity of the results presented and methodologies disclosures. As expected, most firms cited a transition to a Solvency II based methodology as the reason for their reduced level of disclosure. Given that many firms moved towards Solvency II as a basis for shareholder value reporting some might see the SFCR as supplying some of the information that used to be in EV disclosures. However, the SFCR does not contain information around new business or analysis of change, for example.

Updated advice by the CFO Forum in May 2016 made the previously prescribed level of disclosure optional. The recommended minimum disclosures were reduced to only include:

- Assumptions
- Methodology and key judgements
- Sensitivities
- Explanations of the changes in results from the previous year-end
- Descriptions of any areas of non-compliance

This is in comparison with previous years, where firms were also required to disclose details of:

- A reconciliation of opening and closing MCEV
- Group MCEV
- Prescribed sensitivities
- A reconciliation to IFRS net asset value

Two CFO Forum members, Aviva and Legal & General, discontinued their embedded value reporting and considerably reduced their disclosures for 2016 as part of a move to discontinue their EV reporting from 2017. Disclosures by other CFO Forum firms were similar to last year. However, given the announcement of reduced disclosure by these two firms, it is anticipated that other market participants will follow.

Amongst the other companies reporting embedded value, several have removed certain disclosures. Examples include:

- Value of new business
- Split of embedded value by components
- VIF emergence
- Reduction in methodologies descriptions

This is significant given that VNB and VIF emergence have been viewed as useful disclosures by both investors and analysts in recent years.

Where firms disclosed sensitivities, they were in general consistent with those prescribed in the MCEV Principles. However, several companies disclosed additional sensitivities for the removal of the VA and/or a sensitivity to the existing VA of +10 basis points (bps). Allianz also disclosed a -200 bps sensitivity to the ultimate forward rate (UFR) and AXA disclosed +/-50 bps sensitivities to credit spreads whilst Royal London disclosed a sensitivity to a 50% increase in capital requirements.

There has been a reduction in the number of firms having their EV results audited this year, with three companies no longer doing so. Of these firms, two had moved away from EV reporting to their own shareholders' value metrics, whilst the third had considerably reduced its EV disclosures. However, in contrast Allianz and AXA, which aligned their EV reporting with the Solvency II balance sheets, stated compliance with EEV and MCEV Principles respectively, with the auditors' opinion accompanying the published reports.

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 with market capitalisation and then how developments in IFRS reporting may impact embedded value reporting going forward.

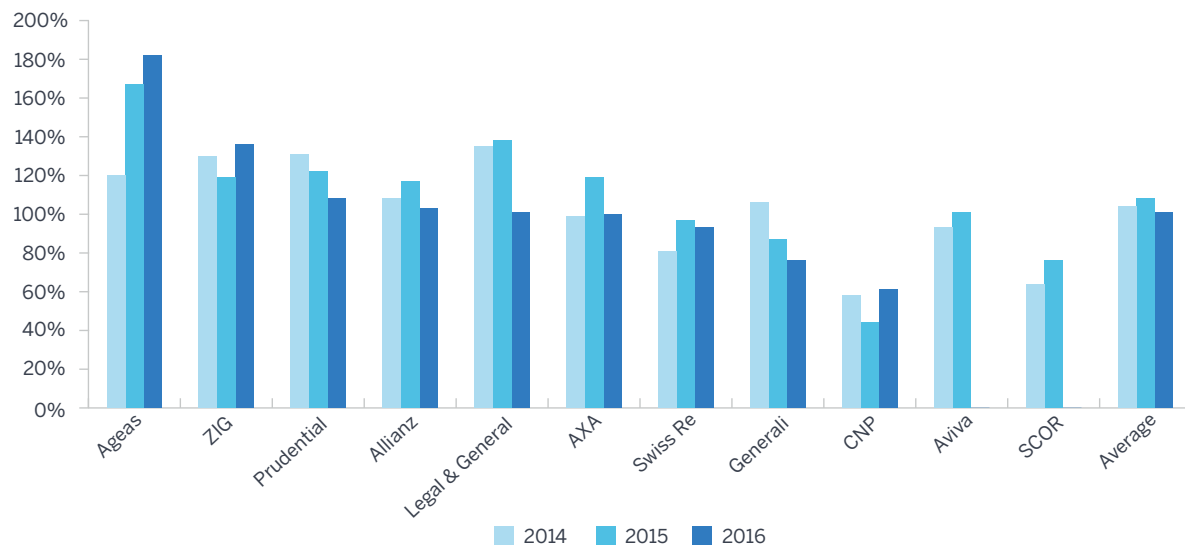
MARKET CAPITALISATION

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 with its embedded value at a given point in time and look at how this evolves over time, potentially in response to changes in the market environment.

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. Other reasons for discrepancies may be timing differences between the availability of embedded value and market data, as well as multiple business lines being written (e.g. non-life, investment management, pension fund management) whereby profitable non-life business is not recognised under EV reporting but will be captured in the capitalisation.

Figure 9 shows the market capitalisation as a percentage of the embedded value for current CFO Forum members included in our survey, as at year-end 2014, year-end 2015 and year-end 2016.

FIGURE 9: MARKET CAPITALISATION AS A PERCENTAGE OF EMBEDDED VALUE AS AT 31 DECEMBER 2014, 2015 AND 2016



Notes

1. Excludes Talanx because its embedded value figure does not contain all the business within the group.
2. Market capitalisation has been sourced from Bloomberg for the last trading day of 2016, 2015 and 2014.
3. Ageas embedded value is the total of 'life' and 'non-life & other insurance'.

The average ratio of market capitalisation to embedded value was 101% as at year-end 2016. Looking at individual ratios, whereas last year only two companies were in the 90% to 110% range, this year five companies were in this range – Prudential, Allianz, Legal & General, AXA and Swiss Re (which was in the range last year). Aviva, which was the other firm within the range last year, has not disclosed an EV in 2016.

Despite this, half of the firms were not in the range of 90% to 110%, with results varying between 61% and 182%. In keeping with last year, Ageas had the largest ratio in 2016, of 182%, which is considerably higher than all the other firms included in our survey. However, both Ageas's market capitalisation and EV have noticeably fallen since the 2015 results, because of the sale of Ageas Asia Holdings in May 2016, which may have acted to amplify the ratio.

IFRS DEVELOPMENTS

International Financial Reporting Standards (IFRS) have applied to the consolidated financial statements of listed companies in the EU since 2005.

The preparation of accounts under IFRS gives rise to a different interpretation and timing of profit and loss compared with an EV basis. The current IFRS 4 standard for insurance contracts, implemented in 2004, largely permitted the continuation of reporting methodologies applied prior to its implementation. They typically focus on a current view of assets and liabilities together with current profit generation. EV makes allowance for expected future earnings from the in-force book and the shareholder value created. Reconciliation of these measures helps to reveal features of insurers' underlying performance.

On 18 May 2017 the International Accounting Standards Board published its new standard on accounting for insurance contracts: IFRS 17. The Standard's aims are consistent accounting for all insurance contracts, increased transparency in financial information reported by insurance companies and reported information based on current estimates.

IFRS are adopted by the EU in the form of regulations that are directly applicable to member states. The process for EU endorsement of IFRS 17 is expected to take between 24 and 28 months.

Subject to endorsement, the Standard will apply for accounting periods starting on or after 1 January 2021, but a prior year of comparative figures will be required⁶. There may be additional reporting requirements within individual jurisdictions.

In summary, the principle-based Standard requires an assessment of the profitability of groups of insurance contracts when they are first issued and, if positive, recognition of that value (the CSM) over the lifetime of the contracts in a manner that reflects the timing of the insurance services being provided by the insurer. The CSM forms part of the liabilities, and so at outset it offsets any profit expected to be earned from the contracts.

The CSM is broadly similar to the present value of future profits (PVFP) calculated on a market consistent basis, but there are key differences including:

- The CSM is updated to reflect changes in expectations regarding future experience of non-economic factors (such as mortality and lapse rates). However, other than for groups of *direct participation contracts*⁷, the CSM is not updated to reflect changes in economic factors. In particular, the discount rate used at policy inception to determine the CSM is applied throughout the term of policies that are not direct participation contracts.
- A negative CSM is not maintained for groups of policies that are deemed to be loss making at policy inception; the loss is recognised immediately in the profit and loss (P&L) account and cannot be offset against positive CSM determined for other groups.
- If adverse experience results in the CSM for a group of contracts falling to zero during the term of the contracts then subsequent losses must be recognised immediately in the P&L. The CSM for the group is only reinstated if, after allowing for the recouping of losses previously recognised in the P&L, it subsequently recovers a positive value.
- It is unlikely that it will be practical to accurately calculate the CSM at policy inception, and roll it forward to the reporting date, for all business in force when the Standard is first implemented. The Standard permits approximate estimates for the rolled-forward CSM to be used.
- The CSM for a group of contracts is determined after allowing only for those acquisition expenses that are deemed to be directly attributable to those contracts.

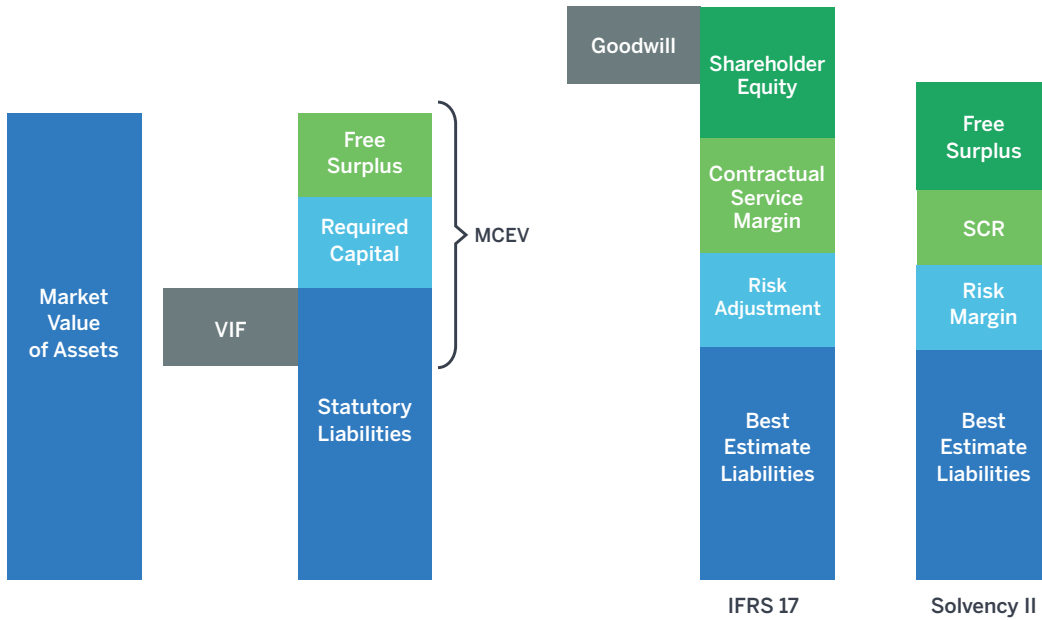
⁶ Earlier adoption is permitted provided IFRS 9 Financial Instruments and IFRS 15 Revenue from Contracts with Customers are also applied.

⁷ Insurance contracts for which there is a close contractual relationship between policy benefits and investment returns earned on backing assets, such as with-profits and unit-linked policies.

IFRS 17 disclosure requirements are substantial, and it is expected that the level of disclosure will allow interested parties—investors, market analysts—to obtain a sufficient amount of information about the profitability of the business.

IFRS 17 is compared with MCEV and Solvency II in Figure 10.

FIGURE 10: COMPARISON OF MCEV, SOLVENCY II AND IFRS 17 BALANCE SHEET



Time will tell whether companies use Solvency II or IFRS 17 as the reference point for MCEV.

INTERNATIONAL CAPITAL DEVELOPMENTS

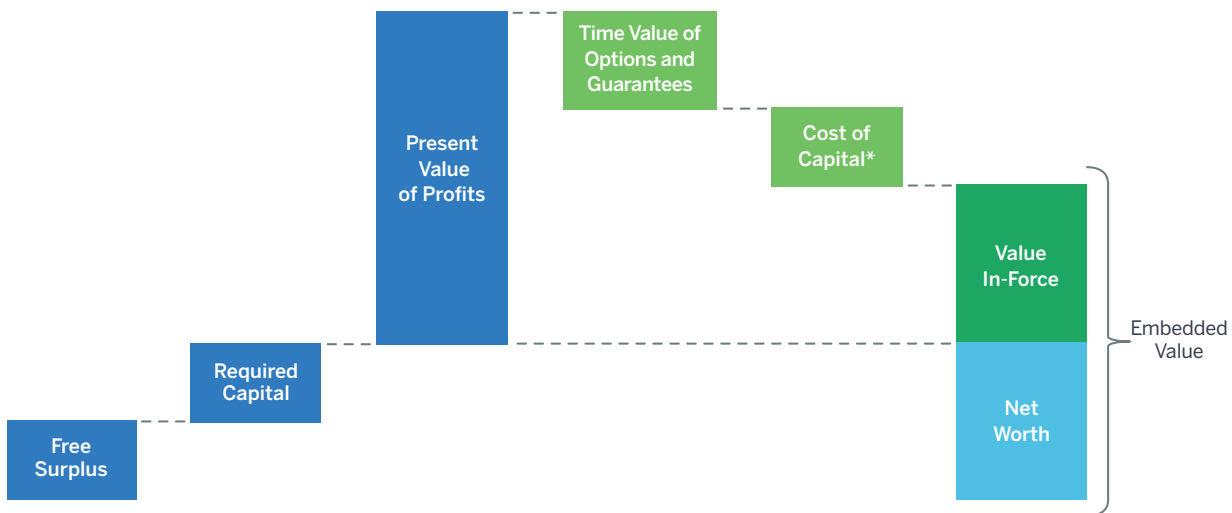
The International Associations of Insurance Supervisors (IAIS) is developing a risk-based global Insurance Capital Standard (ICS). It is expected to apply to the approximately 100 Internationally Active Insurance Groups (IAIGs). The ICS is still in development. In 2016 the IAIS undertook field testing of the ICS. Version 1.0 of the ICS will be used for confidential reporting to the IAIS, expected in 2018, and an updated version 2.0 is expected to be adopted in 2019. Implementation is currently expected to be in 2020 after further testing and refinement by supervisors.

It is not currently clear how the IAIS’s ICS will interact with the capital requirements of Solvency II for the IAIGs that will be subject to both capital regimes. It may result in changes to the way such groups will measure and report their value to shareholders.

Appendix 1: Overview of embedded value methodology

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 two sets of principles, including key terminology, is described below and illustrated in Figure 11.

FIGURE 11: SUMMARY COMPONENTS OF EMBEDDED VALUE



* Under the MCEV Principles, the CoC is split into frictional costs and the CRNHR. Companies using the EEV Principles may also choose to adopt this approach.

Under both the EEV and MCEV approaches, the embedded value is calculated as the sum of the *net worth* and *value of in-force* 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* 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 CoC 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). They can include both financial and non-financial risks.

CONSTRUCTION OF THE RISK DISCOUNT RATE

Companies can construct their risk discount rates (RDRs) 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.

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 risk margin that is specific to each cash flow. 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 RDR 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 RDR. The certainty-equivalent approach may also be adopted by firms reporting under the EEV Principles.

Basis for risk-free rate

To begin the construction of a suitable RDR 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.

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 the MA and VA to the risk-free rate to reduce short-term market volatility.

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 liquid point (LLP) to some long-term equilibrium rate (sometimes referred to as the 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

COST OF CAPITAL

CoC 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*). CoC may also arise in respect of non-hedgeable risks, which are covered separately below.

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.'*⁸

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 CoC may be calculated based on the difference between the *real-world* investment return assumptions and the RDR.

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 may potentially 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 TVOG 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 CRNHR should be applied and sufficient disclosures provided to enable a comparison to a CoC methodology.'*

8 This Principle has been amended in May 2016 and now states that where Solvency II is adopted for solvency reporting, and the Solvency II risk margin contains sufficient allowance for the frictional costs of required capital, no further allowance for frictional costs of required capital is required.

When assessing the CRNHR, companies usually consider the following:

- The cost of non-hedgeable risks where they have not already been allowed for in the PVFP or TVOGs
- The asymmetry⁹ of risks and the impact that it has on shareholder value
- The cost associated with the uncertainty in setting best-estimate assumptions

Under MCEV Principles, regardless of how companies allow for the CRNHR, the equivalent average CoC 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 CoC 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 CoC charge based on the capital required on a 99.5% confidence interval over a one-year time horizon.

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.

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 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.

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.

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



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