

# ISSUES IN BRIEF

UK LIFE INSURANCE

RETHINKING OPERATIONAL  
RISK MODELS

THE FUTURE OF  
LIFE INSURANCE TAXATION

CEIOPS CONSULTATION  
PAPER ON VARIABLE ANNUITIES

PRODUCT INNOVATIONS: 2011

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# WELCOME TO THE FIRST EDITION OF

“ISSUES IN BRIEF” FOR 2011. IN MY INTRODUCTION TO THE AUTUMN 2010 EDITION, I QUESTIONED WHETHER A PHASED INTRODUCTION OF SOLVENCY II MIGHT LEAD TO A BETTER END PRODUCT BY ALLOWING MORE “THINKING TIME”. I HAD IN MIND THAT, WHILE THE MAIN BUILDING BLOCKS OF PILLAR 1 WOULD NEED TO BE IN PLACE FROM THE OUTSET, AN EXTRA YEAR (OR PERHAPS TWO) COULD BE ALLOWED FOR REFINING THE CALCULATIONS AND IMPLEMENTING SOME OF THE PILLAR 2 FEATURES, SUCH AS THE ORSA.

Even in my most fanciful moments I did not dream that the European Commission would propose, in the draft Omnibus II Directive, a transition period of up to 10 years for introducing some of the fundamental elements of the new system, such as fair valuation of assets and liabilities and calculation of the SCR.

While it is expected that the Commission will significantly shorten the permitted transition periods, it is unclear at this stage whether individual member states will have the flexibility to require full compliance from January 2013. Should this be the case, the new proposals create the prospect of a multi-speed Europe and risk undermining the credibility of Solvency II. The idea that a consistent solvency regime for insurers throughout the EU may not be achieved until 2023 seems completely at odds with the original aims and ideals of the project. Having taken us from one extreme to the other, let us hope the final text of the Omnibus II Directive reflects a greater desire to make Solvency II count.

More details of the content of the draft Omnibus II Directive are provided in an article beginning on page 8.

**NICK DUMBRECK**  
PRINCIPAL AND  
CONSULTING ACTUARY



This edition also includes an article from Sanket Kawatkar, who leads Milliman's life practice in Mumbai. Sanket describes the regulatory changes for unit-linked and universal life products introduced by the Indian regulator in 2010, which have stalled the spectacular growth of many of the private life insurance companies established in India since 2000. The changes, which necessitate a fundamental re-thinking of the business models of the companies affected, were introduced with minimal consultation. In the case of the universal life changes, insurers were given a notice of only 24 hours to withdraw their existing universal life products. They highlight the business risks that exist in any market where part-time sales forces with low levels of training, low productivity levels and high turnover rates sell products with low surrender values without proper regard for their suitability to the mass markets in which they are sold.

Mortality improvements, life insurance taxation, operational risk modelling and protection accounts are among the other topics covered in the following pages. Happy reading!

If you would like to hear more, please contact me at [nick.dumbreck@milliman.com](mailto:nick.dumbreck@milliman.com).

# RETHINKING OPERATIONAL RISK MODELS



In several areas, Solvency II has stimulated firms to evaluate how they can better integrate their risk modelling and risk management processes. Whilst some advances have been made in operational risk, it has remained difficult to integrate the two properly and to make sensible auditable estimates of operational risk capital which can be of use in driving business decisions. In this article, we describe a different approach which very naturally brings these together.

## CURRENT PRACTICE AND CHALLENGES

Firms which already model operational risk will typically use some variation the following process:

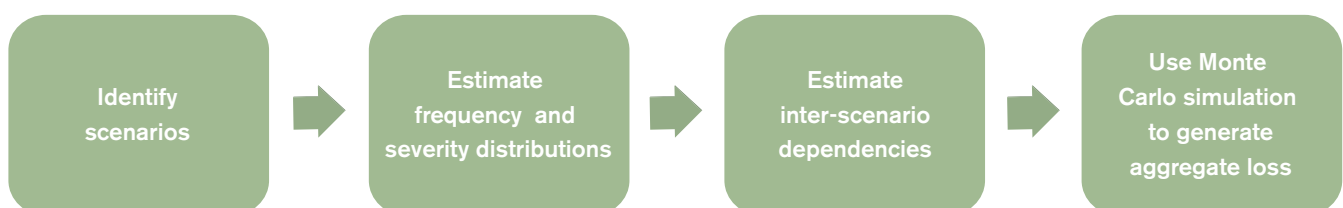
Scenarios are often identified through an iterative brainstorming process supported by analysis of recorded losses or near misses. Given the universe of possible loss scenarios, this process is often less than robust since it is clearly impossible to know with certainty that a “workshop” has covered all possibilities. Techniques like cognitive mapping can be used to significantly improve the quality of scenario generation.

For the frequency and severity distributions, the parameters are usually chosen with reference to industry data, internal data and expert judgement, with sample model outputs shown to experts to help them iterate their views. The presence of cognitive bias and the difficulty of showing experts a meaningful output that they can “validate” make it hard to be sure that the distribution of losses is correct.

Dependencies between the scenarios tend to be specified in a rather simplistic way (e.g., correlation matrices) and often reflect a qualitative view about the strength of connection rather than any truly precise measurement. Practitioners have recently started moving towards more sophisticated dependency structure devices such as copulas, but calibrating these with any degree of precision in the real world is problematic.

Attempts to model financial risks, and certain insurance risks, have traditionally followed a similar statistical path. For many, the route to better operational risk models has therefore been seen simply as a matter of finding more data to calibrate against. However, there continues to be a paucity of data relating to operational risk losses in most companies and in the

FIGURE 1: TYPICAL PROCESS USED BY FIRMS ALREADY MODELLING OPERATIONAL RISK



for the more extreme, less frequent events. Even if more data were available, there are other fundamental differences in the way operational risk emerges which challenge the use of statistical methods.

A particular feature of operational risks is that they are less easy to classify. The statistical methods currently used rely upon being able to identify outcomes which have broadly the same drivers. Typical methods for classifying operational risk scenarios assign a label, and treat risks with the same label as being broadly homogeneous for the purposes of modelling. (In a previous article *Oversimplifying risk analysis*, Spring 2010, we showed how approaches like our Risk DNA Analysis™ can be used to permit a more realistic classification of risks). The fact that operational risks are intrinsically linked to management processes means that the actions taken to manage or mitigate the risk are very important considerations. Considering the complexity of the interaction and evolution of underlying risk drivers and the effects of management processes which try to mitigate the risk, it is not surprising that the resulting outcome does not follow a straightforward statistical process.

## AN INTEGRATED MODELLING APPROACH

Modelling techniques are available which permit the integration of qualitative expert judgement and quantitative observations. Often referred to as Bayesian networks, these models describe the structure of the relationships between key drivers of the risk outcome being studied. Some immediate benefits the methodology brings over a statistical approach include:

- The ability to combine expert judgement and actual observations
- The ability to obtain meaningful predictions even where evidence is incomplete

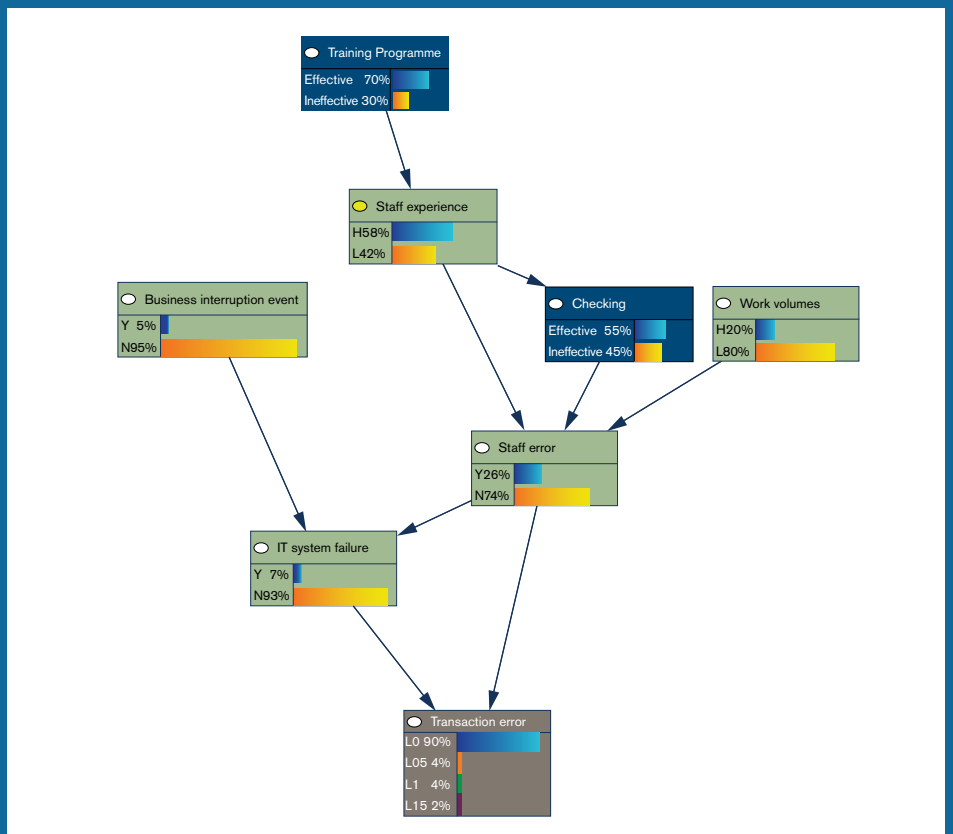
- The logical reasoning behind why the outcome is what it is, is documented explicitly in the model
- The ability to propagate evidence through the model to perform what-if or sensitivity analyses
- The ability to model explicitly the effect of interactions between risk drivers and controls
- The ability to produce outputs which can be validated against observation and updated accordingly – the model learns
- The following simple example in Figure 2 shows a Bayesian network model of losses over one year arising from a transaction error.

Each “node” on the diagram is a risk driver (light blue) or an action being taken to mitigate the risk (dark blue). The state of some nodes depends upon the state of others. For example, the chance of staff making an error depends upon their experience, whether the work is being checked properly and whether they have a high volume of work.

The initial parameters for these nodes are selected by experts using a combination of judgement and data. In the above example, we can compute an approximate value-at-risk figure of £1.40m at 99.5% by interpolating the distribution shown in the bottom node. We can now begin to study the model and ask what-if questions. For example, what if work volumes are “high”? We can propagate this evidence to obtain a revised loss distribution, and VaR estimate of £1.44m, as shown in Figure 3 on the next page:

(CONTINUED ON PAGE 4)

FIGURE 2



(CONTINUED FROM PAGE 3)

Alternatively we can ask what state the drivers and controls might be in if we experience a large loss, as shown in Figure 4.

We can see that there is strong evidence that for this outcome to occur the checking process was largely ineffective and that staff experience was low. There is also a significant increase in the possibility that some business interruption has led to an IT failure.

In addition to understanding the sensitivity of the model to different assumptions, you can update the node parameters as new evidence is uncovered, using a Bayesian process. So, in our example, let's say that the experts initially guess that for 60%-80% of those attending training it is effective, and for 25%-35% it is not. We therefore have an initial estimate in the model that 70% of training is effective and 30% is ineffective. If we now observe that only four out of ten training courses over the past year were assessed as effective, and assume that our initial distribution parameters follow a Dirichlet distribution, we could take this observation as evidence that we should update our estimates for the training effectiveness node so that 67% of training is effective and 33% is not.

Extending the model beyond a single scenario, it is possible to allow very naturally for common drivers or control processes without needing to rely upon correlation estimates. In Figure 5 we show a simple example where an error committed by staff may be a contributing factor in two risk events.

FIGURE 3

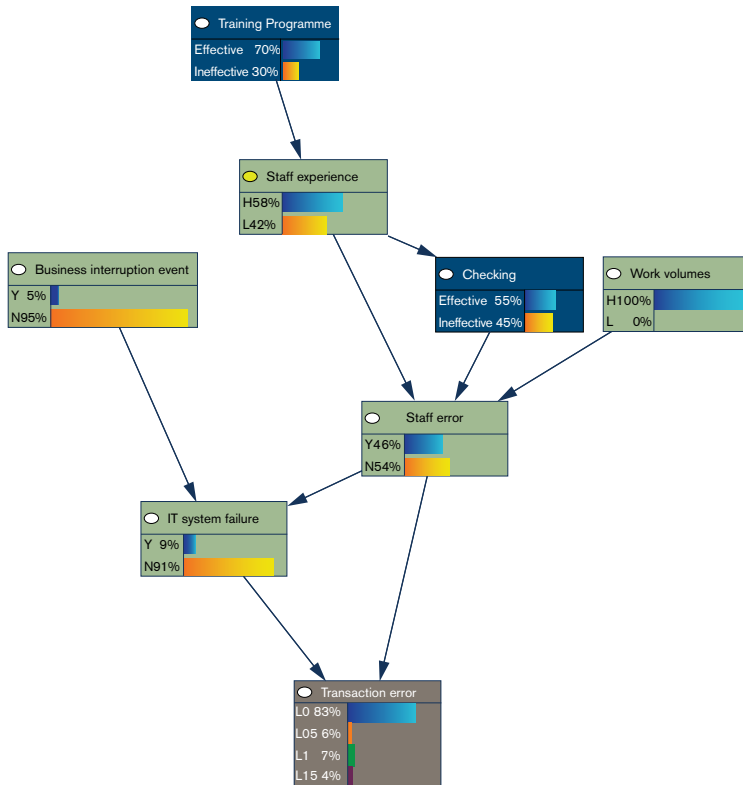
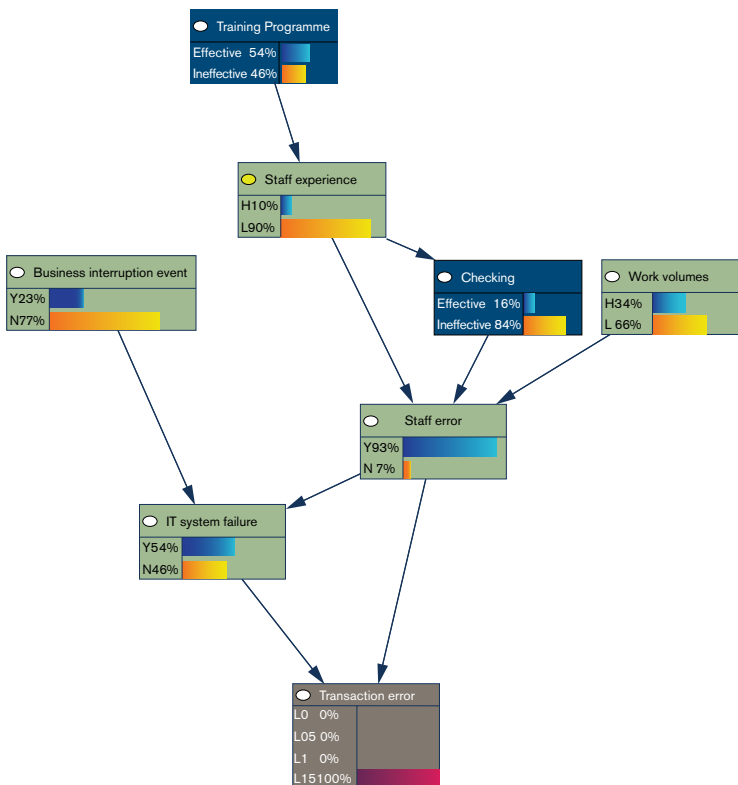


FIGURE 4

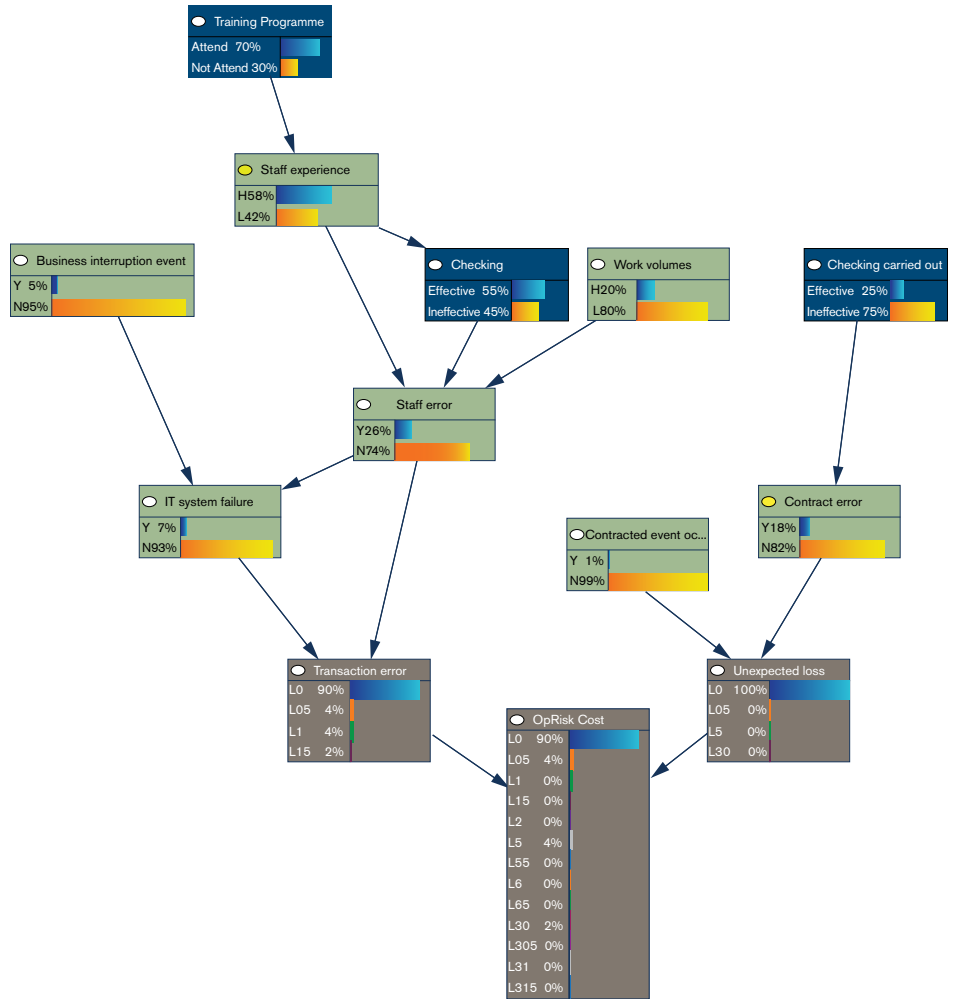


SUMMARY

For those companies wanting to develop operational risk models which are expressed in a language that business experts can understand, and where observed control performance can flow directly into the model, Bayesian networks offer a robust alternative to statistical approaches. In addition to combining expert judgement and observed evidence, they can readily be updated as new evidence emerges. Modern tools enable Bayesian networks to update almost instantly and so the run-times of Monte Carlo models are no longer required – this effectively permits models to be built in real time with the experts in the room. By building such models in collaboration with business experts, you simultaneously create a modelling and monitoring tool. This can be used by the business to monitor the holistic effects of key drivers, and by the modellers to answer questions about capital allocation in respect of operational risk but expressed in terms of meaningful business activities rather than statistical distributions.

If you have any questions about operational risk modelling or other risk management activities please contact Neil Cante at [neil.cante@milliman.com](mailto:neil.cante@milliman.com) or Fred Vosvenieks at [fred.vosvenieks@milliman.com](mailto:fred.vosvenieks@milliman.com).

FIGURE 5



**MODERN TOOLS ENABLE BAYESIAN NETWORKS TO UPDATE ALMOST INSTANTLY AND SO THE RUN-TIMES OF MONTE CARLO MODELS ARE NO LONGER REQUIRED – THIS EFFECTIVELY PERMITS MODELS TO BE BUILT IN REAL TIME WITH THE EXPERTS IN THE ROOM.**

# THE FUTURE OF LIFE INSURANCE TAXATION



Currently in the UK, the taxation of proprietary life insurance firms is based on the surplus shown in the firms' annual regulatory returns to the Financial Services Authority (FSA returns). With the coming of Solvency II, the current regulatory returns will be replaced with a new set of forms that do not include a similarly derived figure for surplus to base tax on.

In March 2010, HM Treasury and Customs (HMRC) issued a consultation paper on the taxation of insurance companies under Solvency II. In addition to the impact of Solvency II, the consultation paper also discussed the complexities of the current tax system (in particular, business taxed on income minus expenses, or I – E) and considered whether this introduced market distortion. Various different measures for determining taxable profit are possible, and the consultation paper proposed basing taxable profits on the statutory accounts (suitably adjusted to give the Life Assurance Trading Profits) rather than the Solvency II *movement in funds* figure.

HMRC also wished to receive views on whether a wider reform of the taxation of life insurance firms was desirable. Responses to the consultation paper were due by 2 June 2010.

HMRC received approximately 40 responses to the consultation paper. The responses showed a general acceptance of statutory accounts as the basis for Life Assurance Trading Profits and no appetite for the abolition of I – E in the short term, as this would create extra complications on top of those arising from the implementation of Solvency II. On 12 July, HMRC announced that, in the light of the responses, it did not intend to proceed with further consultation of the fundamental reform or replacement of I – E, but that review of I – E will continue, particularly looking at whether it creates material market distortions (for example, acting as a barrier to entry for new protection writers).

HMRC and other parties, including industry bodies, have set up a number of joint working groups to look at the detailed issues of moving to a taxation regime based on statutory profits. There are a number of specific issues that need to be considered, including:

- Not all profits recognised in the statutory accounts may be available for immediate distribution to shareholders and consequently these encumbered profits should not be taxed until they are available.

- The profit measure from the statutory accounts is potentially more volatile than that which has been used in the past.
- How the transition between the existing and the replacement tax regime will be managed.
- Apportionment of business between shareholders and policyholders. Currently, it is not clear if the current position of having a separate regulatory Long-Term Business Fund and Shareholder Fund will continue under Solvency II.
- How changing the tax regime will affect mutuals, particularly those writing tax-exempt business.

One further complication with using statutory profits is that UK GAAP is due to be replaced with IFRS Phase II on 1 January 2014. Whatever system is derived for tax under Solvency II, it needs to be flexible enough to accommodate the implementation of IFRS Phase II without introducing material changes during the interim periods.

The expected timetable for the implementation of the new regime is that HMRC will submit its recommendations to ministers in February 2011 in time for announcements in the March 2011



budget. There will then be a period for the budget announcements to be refined and legislation to be drafted. The draft legislation is expected to be formally published in autumn 2011 and the main legislation will be included in the Finance Bill in spring 2012. The implementation date will depend upon the start date of Solvency II, currently expected to be 1 January 2013.

Although the big picture is beginning to emerge, there remains a high degree of uncertainty over the precise details of life insurance taxation under Solvency II. In particular, as the final Solvency II text for Level 2 rules and Level 3 guidance emerges, it is likely to influence the final form of life insurance tax. There will be very little time for firms to develop the reporting

tools to deal with the details once the final tax legislation is published in the 2012 Finance Bill.

If you would like to discuss any of the topics raised in this article, please contact Philip Simpson at [philip.simpson@milliman.com](mailto:philip.simpson@milliman.com), or your usual Milliman consultant.

## CEIOPS: CONSULTATION PAPER ON VARIABLE ANNUITIES

In November 2010, the CEIOPS (now replaced by the European Insurance and Occupational Pensions Authority, EIOPA) Task Force on Variable Annuities (VA) issued a consultation paper on the supervision and management of the VA product offering. We at Milliman have been strong advocates of establishing minimum risk management standards for this class of business.

In considering the proposed Solvency II framework, one of the consultation paper's key assertions, which may attract some discussion, is that due to the complexity of the VA, the SCR standard formula is likely to be inadequate for determining capital requirements in respect of VA business. However, internal models are capable of including the necessary features to be fit for VA. Examples of key risk factors not included in the SCR QIS5 framework that the paper highlights are:

- Vega risk – The risk that volatility (including equity, currency and interest rates) is higher than expected
- Basis risk – The risk that the underlying funds deviate from the indices and risk factors used to hedge them
- Liquidity risk – Two components of liquidity risk are touched upon. Asset price liquidity where hedge assets may need to be sold when asset prices are depressed – such as when lapse experience deviates significantly from assumptions – and cash-flow liquidity due to higher than usual margin calls.

The consultation paper adopts a cautious stance towards the consideration of, and allowance for, hedge assets in risk capital calculations. For an internal model that qualifies under Solvency II, the Task Force believes that it is reasonable to allow insurers to recognise the role of hedging programmes. However, this is subject to *strict limitations* concerning hedging efficiency. A key issue, therefore, is how these limits will be derived. The consultation paper suggests both qualitative and quantitative limits. Qualitative measures relate to satisfying criteria for good practice in hedge management, whilst quantitative limits are in the form of benchmarks based upon demonstrated hedge performance.

Milliman welcomes the recommendation that the efficiency of hedging programmes need to be assessed regularly, and this is a key part of our own hedge outsourcing service offering. In managing a hedge outsourcing business, we recognise that frequent and comprehensive hedge performance assessment is vital in enabling our clients to understand how well their risks are being managed. Diligent hedge performance monitoring also helps improve understanding of the behaviour of the residual risk factors that remain un-hedged, and facilitate the development and refinement of risk mitigation strategies as risks evolve over time. With the same underlying models used for risk exposure quantification, capital stress calculations and hedge performance assessment, this all fits naturally within the ORSA requirements for internal models.

In addition to technical considerations, the consultation paper has a discussion on the governance of variable annuity business. This includes discussion of controls and responsibilities under a reinsurance and outsourcing framework as well, for both the risk management and product design of VA business. One point the paper highlights as a recommendation, which we also strongly advocate, is the need for hedge feasibility and risk appetite to be a consideration at an early stage in product development.

Finally, there is a discussion of the macro-prudential issues relating to this particular market. The paper cites that the majority of this market has interacted with a single adviser, with industry senior executives commenting that they believe 95% of the VA related hedging trades were done using this adviser's software. We understand this reference to be our FRM team at Milliman and our flagship system MG-Hedge. We will be keenly continuing to advocate the establishment of minimum risk management standards for this class of business, and will provide our input to the Task Force, drawing upon our extensive experience in the VA market and risk management of VA guarantees.

If you have any questions, please contact Neil Dissanayake at [neil.dissanayake@milliman.com](mailto:neil.dissanayake@milliman.com) or Gary Finkelstein at [gary.finkelstein@milliman.com](mailto:gary.finkelstein@milliman.com).

# OMNIBUS II



**O**n 19 January 2011, the European Commission (EC) published the draft text of the Omnibus II Directive.

This makes a number of proposed adjustments to the existing Solvency II directive in light of the Lisbon Treaty, which recently came into force, provides details of areas where transitional measures may be applied, and proposes a two-month extension to the Solvency II implementation date. The main areas of change proposed relate to:

- The introduction of EIOPA to replace CEIOPS and to address the wider responsibilities envisaged for it
- The introduction of a procedural device called a “delegated act” to manage the required implementing measures
- The establishment of a structural timetable for the introduction of Solvency II and the management of transitional arrangements

The new text also corrects a few errors which slipped through in the Level 1 text.

## EIOPA AND ITS ROLE IN THE SOLVENCY II FRAMEWORK

The Omnibus II text makes a number of changes to the Solvency II Level 1

directive, not least in the replacement of CEIOPS by EIOPA. The draft text proposes a range of amendments to the authority and responsibilities under the current Solvency II Level 1 Directive following public consultations and an impact study carried out during 2009.

Some new articles have been proposed which extend or clarify the way that certain features of Solvency II will be managed:

- EIOPA may specify how values for assets and liabilities may be established where there is no reference market value or where there is either a temporary or a permanent divergence between Solvency II and IFRS requirements
- The requirement for EIOPA to publish information on the relevant risk-free interest rate term structure and information on the illiquidity premium “in periods of stressed liquidity”
- The role of EIOPA in harmonising inputs to the standard formula, including:
  - Assessing the eligibility of external credit assessment institutions
  - Publishing lists of regional governments and local authorities to be treated as central government exposures

- Specifying the equity index to be used for the calibration of the equity risk sub-module and providing information on the symmetric adjustment

- Specifying the adjustments to be made for currencies pegged to the euro

- The supervisory requirements in approving major changes to the internal model, changes to the policy governing changes to the internal model, or for approaches to be adopted for integrating the results of a partial model within the standard model
- EIOPA can define when a “market event” has occurred and may do so in relation to an individual market

## DELEGATED ACTS

“Delegated acts” are introduced as a new power granted to the Commission which will apply to many aspects of the functioning of the Level 2 rules for setting the “implementing measures.” The widespread use of this procedural device appears to be intended to allow the Commission (through EIOPA) to be more sensitive to the evolving experience of Solvency II in practice. The use of the delegated acts procedure by the Commission will be subject to specified governance requirements.

## IMPLEMENTATION TIMETABLE

As long anticipated, the draft Omnibus II text proposes a two-month delay in the implementation date for Solvency II. Solvency II will now come into force on 1 January 2013. All of the original timetable dates set out in the Level 1 Directive have similarly moved back by two months.

The delay in the implementation date is likely to mean that companies will not be required to apply the Solvency II requirements in the 2012 year-end, although the exact prior year reporting requirements for 2013 remain to be finalised. However, this means that the first “live” run of most companies’ Solvency II valuation systems will be a quarterly valuation as at March 2013. While this will give companies the opportunity to perform three live runs before the first published valuation, it remains to be seen whether an initial full run will be required at this stage. If a full run is not required, consideration should be given by companies as to how they will reconcile and justify any approximations they make in their capital calculations at this stage without the boundaries of a full capital calculation.

## TRANSITIONAL PROVISIONS

Omnibus II sets out a number of areas where the Commission may adopt transitional measures, in order to ensure a

smooth transition to the new regime and avoid market disruption, as well as details of the maximum period for which these measures may be applied.

The paper highlights that during any transition period, the requirements should be at least equivalent to existing requirements and as such should not result in favourable treatment to companies, nor provide a lower level of protection to policyholders than currently applies under the Solvency I requirements.

The specific areas where the text proposes transitional measures may apply are set out in the table below.

In addition to the table below, the text sets out the need for Level 2 measures to include transitional arrangements for third-country regimes in order to provide them with sufficient time to adopt and implement an equivalent solvency regime.

The paper stresses that the transitional periods specified in the Omnibus II text are intended as maximum periods and, as such, the actual transitional periods adopted may be significantly shorter. While the final periods will be applied at a Europe-wide level by the Commission, it is unclear whether individual countries may choose to transition faster if they so wish. If this were the case, it could cause confusion and present the opportunity for regulatory arbitrage across territories as companies

search out the most lenient regulatory requirements. In particular, for groups operating throughout Europe, significant difficulties could arise in reconciling solo capital calculations performed under a mixture of Solvency I and Solvency II to the group reporting requirements.

The regulatory requirements applied during these transitional periods should encourage companies to move towards total compliance with the full Solvency II regime as soon as possible. Despite this, these transitional terms appear to give the Commission the power to switch off or radically weaken many fundamental aspects of Solvency II, and indeed promote the continuation of Solvency I. Third countries may well ask why they should seek equivalence to this vision of Solvency II.

We have prepared and circulated a briefing note to help practitioners get a slightly more detailed overview of this paper as well as other briefing notes covering the Level 3 pre-consultation papers – if you work for an organisation which is entitled to obtain the CEIOPS/EIOPA Level 3 papers and did not receive a copy, please let us know.

If you have any questions about the Omnibus II text or any other aspect of Solvency II, please contact William Coatesworth at [william.coatesworth@milliman.com](mailto:william.coatesworth@milliman.com), Neil Cattle at [neil.cattle@milliman.com](mailto:neil.cattle@milliman.com) or your usual Milliman consultant.

Article	Requirements	Max Period
35 (5)	Companies to have appropriate systems and structures in place to provide information on their system of governance, solvency, capital structure, etc. and written policies covering this	3 or 5 years
37(1)(a), 37(2)	Imposing a capital add-on calibrated to a 99.5% Value at Risk (VaR) when the standard formula does not adequately capture the company's risk profile	10 years
41(1), 41(3)	Companies to have a sound system of governance, and written policies covering at least risk management, internal control, internal audit and outsourcing	3 years
51(1)	Requirement to prepare and submit a solvency and financial condition report (SFCR)	3 years
76(2), 76(3), 76(5)	General provisions covering the calculation of technical provisions using market-consistent data and method of calculation (best estimate plus risk margin)	10 years
94	Classification of tiers for own funds	10 years
100, 101(3), 102, 104	Requirement to hold own funds to cover the solvency capital requirement (SCR), the calculation of the SCR, and the structure of the basic SCR (BSCR)	10 years

# THE CMI MORTALITY PROJECTIONS MODEL



**WE MAY SEE AN INCREASING NUMBER OF COMPANIES ELECTING TO ADOPT THE MODEL FOR INTERNAL AND REGULATORY REPORTING PURPOSES THROUGHOUT 2010 AND INTO 2011.**

In June 2009, the Continuous Mortality Investigation (CMI) published Working Paper 38, which introduced a prototype mortality projections model. The need for this model arose as a result of the concern in the CMI and the wider industry that excessive reliance was being placed on the “interim cohort” projections by insurers and pension schemes in their projections of future mortality rates.

The prototype model understandably moved away from giving a “recommended” set of mortality improvement rates, instead offering a methodological structure for the projection of mortality rates. The methodology in the model was based upon the principle that the best guide to mortality improvements in the *near future* is recent mortality experience, whilst acknowledging that attempting to use historical mortality improvements as a reliable guide to future mortality improvements over a long time horizon could be seen as spurious. The model therefore blends a P-spline projection based on recent England and Wales population experience into a long-term rate of mortality improvement over a period which is specified by the user. Population mortality data was chosen as the underlying data because insured lives data was not sufficient for credible modelling.

Subsequently, the CMI issued an updated version of the projections model with an

accompanying working paper in November 2010. The structure of the updated model was unchanged, but the historical data underlying the P-spline projection had been updated to include the England and Wales population experience in 2009, resulting in slight increases to implied life expectancies relative to the parameterisation in the original model. As noted by the CMI, the evidence no longer supports the cohort effect for lives born in 1926 as assumed in the interim cohort projection tables (i.e., short, medium and long cohort projection tables), but there is still a notable peak for the 1931 cohort using England and Wales population data. The peak corresponding to the 1931 cohort is reflected in the CMI model.

The chart on the next page shows how annuity factors vary by age under various illustrative parameterisations of the updated CMI model relative to the medium cohort projection. The CMI model was parameterised using various illustrative values of the long-term rate of improvement. The chart also shows annuity factors calculated using the long cohort projection.

On 9 December 2010, an open forum was held at the Institute and Faculty of Actuaries in London, where the latest incarnation of the CMI model was presented, together with an analysis of the latest historical data points to be added to the model. The presentation

was followed by a debate in the hall on the model itself and on wider issues relating to mortality projections. The hall was split over the issue of the long-term rate of mortality improvement, one of the key features of the model. A number of contributors expressed the view that the CMI should formulate a recommendation for what value, or range of values, the long-term rate of improvement should take when the model is used, but this proposal was strongly opposed by several other participants. They argued that setting the long-term rate of improvement was the job of the individual actuary, taking account of the individual features of their pension scheme or annuity portfolio. The CMI did not come down on one side or the other during the debate. Another such open forum was held at the Royal College of Physicians of Edinburgh on 19 January 2011.

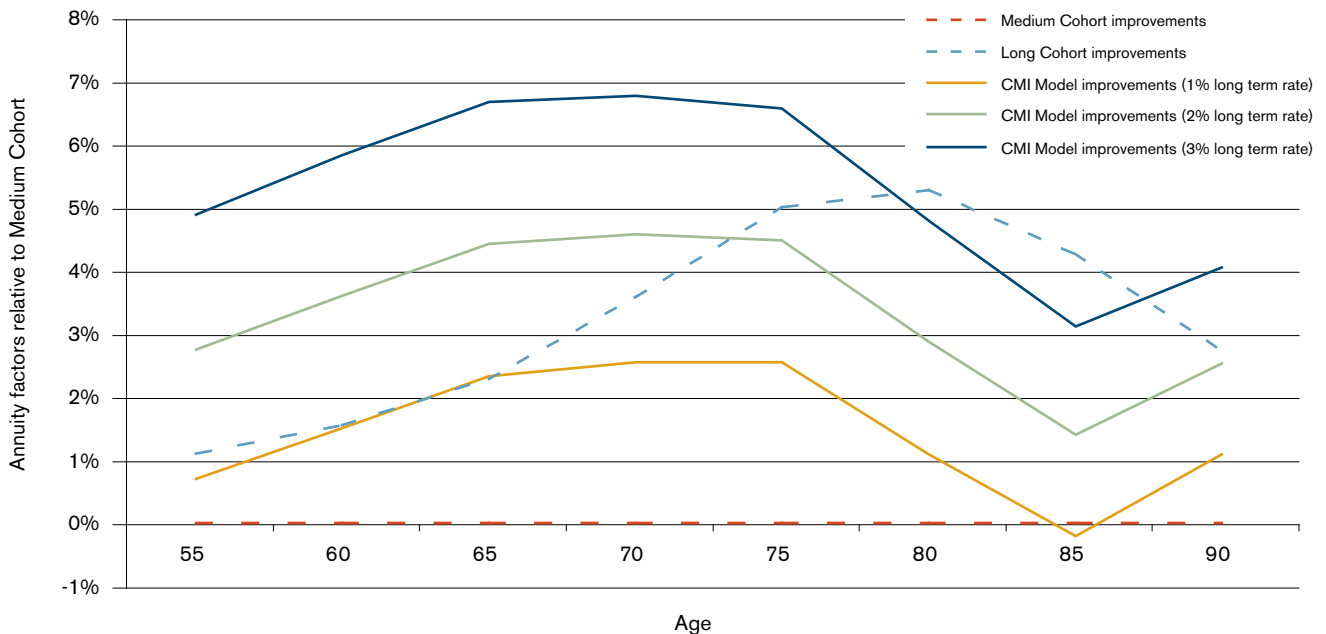
The CMI model has, to date, gained little traction in the UK insurance industry, with some companies adopting the model but many more retaining for the time being modified versions of the interim cohort projections, at least for regulatory reporting purposes. This is, perhaps, understandable as companies take time to familiarise themselves with the CMI model and to experiment with it in order to fix a set of parameterisations which reflects their business.

However, now that the model has been in the public domain for 18 months and companies have had time to get comfortable with its features, we may see an increasing number of companies electing to adopt the model for internal and regulatory reporting purposes throughout 2010 and into 2011, particularly now that a new version of the model with

updated data has been released. It remains to be seen, however, whether the CMI model will be the favoured option for UK annuity providers in the medium term, as Solvency II is implemented and companies re-evaluate their modelling approach.

If you would like to discuss any of the topics raised in this article, please contact Robert Bugg at [robert.bugg@milliman.com](mailto:robert.bugg@milliman.com), Farzana Ismail at [farzana.ismail@milliman.com](mailto:farzana.ismail@milliman.com), Russell Osman at [russell.osman@milliman.com](mailto:russell.osman@milliman.com) or your usual Milliman consultant.

ANNUITY FACTORS VARYING BY AGE CALCULATED AS AT 30 JUNE 2010 USING THE 2010 CMI MODEL, BASED ON VARIOUS ILLUSTRATIVE PARAMETERISATIONS, RELATIVE TO ANNUITY FACTORS CALCULATED USING THE MEDIUM COHORT PROJECTION.



Source: CMI model and Milliman analysis  
 All annuity factors calculated as of 30 June 2010 using illustrative base mortality rates of 100% of the PCMA00 table, with improvements applied from 2010 onwards. For simplicity, no mortality improvements have been applied before 2010. Other than the long-term rate of improvement, all parameters used for the CMI model projections were the default "core" parameters.

# PRODUCT INNOVATION: 2011

## YEAR OF THE PROTECTION ACCOUNT



**UNDERLYING FUND VOLATILITY MANAGEMENT IS ATTRACTIVE TO THE INSURANCE COMPANY AS IT HELPS STABILISE THE COST OF HEDGING GUARANTEES.**

**C**ontinued economic uncertainty relating to government debt and fears of double-dip recession has helped feed the continued

demand for products which protect the investor against stock market falls.

The fourth quarter of 2010 witnessed the launch of AXA's *Secure Advantage Plans*. These are essentially variable annuity style products which operate in both the wealth accumulation and wealth decumulation spaces by offering guaranteed minimum accumulation benefits or guaranteed minimum withdrawal and income benefits on a choice of 9 AXA funds. The product is manufactured cross-border through AXA Life Europe (Ireland), and is highly significant for the UK as it represents the latest major player seeking to compete in the pension market in this way. It is also interesting as it indicates AXA's continued commitment to products manufactured using hedging techniques, and especially for the UK where it recently disposed of many of its other business units to the Resolution Group.

AXA's commitment to products of this type is echoed by Generali, which in Switzerland added a new Guaranteed Minimum Accumulation Benefit (GMAB) product to its portfolio, and ING, which resumed sales in Japan with a GMAB product with annual ratchets. ING's Japanese product has the further interesting feature of fund volatility

management through dynamic allocation between equities and fixed interest, using index futures contracts.

Underlying fund volatility management is also evident in the products of Prudential Financial, which is now the market leader in terms of new sales in the US.

Underlying fund volatility management is attractive to the insurance company as it helps stabilise the cost of hedging guarantees, thereby reducing the need to vega hedge or increase charges to mitigate against the risk of losses due to higher than expected volatility.

Fund volatility management is also characteristic of a type of "sharing" of specific risks with the policyholder through product design, which is a general trend being seen in much of the product development activity at the current time.

Particularly exciting examples of this, also launched during the fourth quarter of 2010, are Pinnacle Bank's Wealth Preservation Target Funds in the US and Sanlam's new product, Global Life Plan, launched through its off-shore company Glacier International. These products operate in many ways similarly to a variable annuity, except that the funds that would have been set aside as reserves against investment guarantees (i.e., the hedge assets) are held in a separate account, called a Protection Account, for the

benefit of the policyholder. In both cases, the hedge assets are managed by Milliman.

The hedge assets are invested to act in an opposite direction to the market. In particular, if the markets fall, the hedge assets increase in value, thereby mitigating the impact of the falling markets. Of course, if the markets rise, the hedge assets in the Protection Account fall in value, thereby reducing the impact of the gain; however, as only a relatively small proportion of funds are invested in the Protection Account, the policyholder still benefits from a substantial upside exposure. In the case of the Sanlam product, the policyholder also has exposure to the wide range of funds on the P2 Protection Account platform.

In a sense, instead of paying a charge or option premium for the guarantee, the funds

are directed to the Protection Account and remain for the benefit of the policyholder. Furthermore, as the hedge assets are exchange-traded futures and interest rate swaps, which are cash collateralised, the company can offer daily liquidity to the customer with minimal credit risk.

Also, if there are no guarantees, then the capital requirement is lower from the insurance company's perspective, reducing the need for high-risk margins in the product pricing. All other things being equal, such products can offer a greater level of protection than guarantee products. In the case of the Sanlam product, the level of protection (and hence the degree of hedging) is initially set to a return of capital after 10 years; however, this is subject to subsequent resets to lock in market gains at 95% of the all-time-high since the previous

reset. In the case of the Pinnacle product, the level of protection is a rolling return of capital over a five year period.

Understandably, these products have generated considerable interest, meeting an important consumer demand. Perhaps 2011 will be the year of the Protection Account, as further launches come on line.

If you would like to discuss any of the topics raised in this article, please contact Gary Finkelstein at [gary.finkelstein@milliman.com](mailto:gary.finkelstein@milliman.com), Neil Dissanayake at [neil.dissanayake@milliman.com](mailto:neil.dissanayake@milliman.com), Neil Cattle at [neil.cattle@milliman.com](mailto:neil.cattle@milliman.com), Joshua Corrigan at [joshua.corrigan@milliman.com](mailto:joshua.corrigan@milliman.com) or your usual Milliman consultant.

# THE IMPACT OF RECENT REGULATORY CHANGES ON THE INDIAN LIFE INSURANCE MARKET

## BACKGROUND

There is never a dull moment in India, certainly not in the life insurance sector!

After a decade of dramatic growth, the life insurance industry in India is currently assessing the impact of a number of recent regulatory changes aimed at enhancing customer protection. The Insurance Regulatory and Development Authority (IRDA) has opted to impose onerous restrictions on the design and pricing of unit-linked insurance products (ULIPs) in order to achieve the desired objective. Recently, the IRDA also introduced guidelines imposing similar restrictions on universal life products (referred to as Variable Insurance Products, or VIPs).

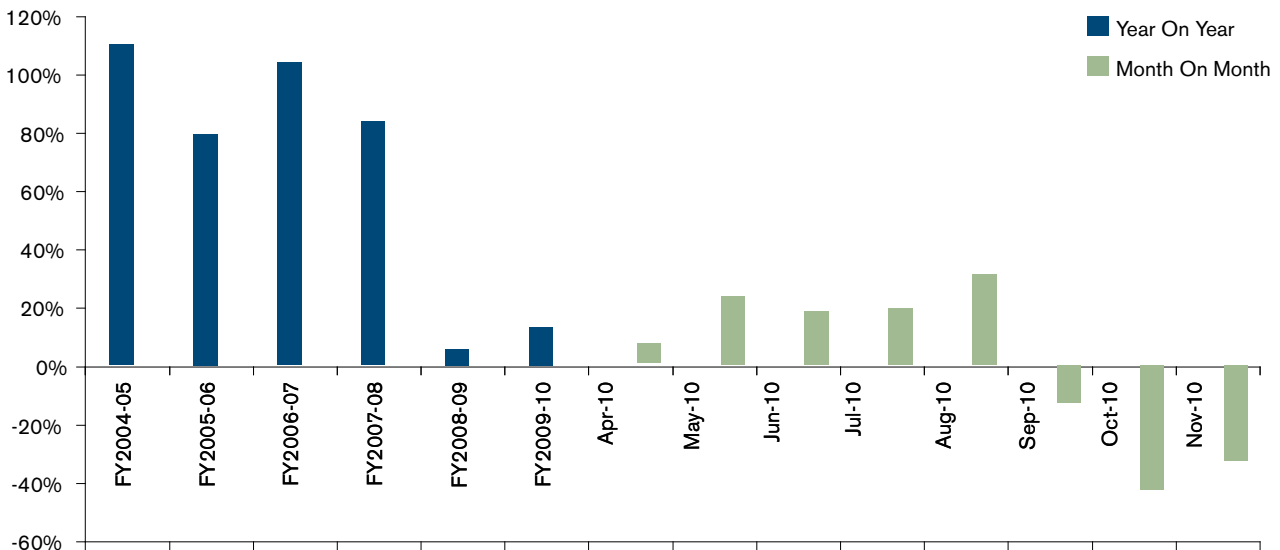
Although aimed at protecting the policyholders' interests, and possibly targeting perceived unhealthy sales practices, the new guidelines are believed to be overly restrictive and are expected to result in a significant slow-down in the growth of the private sector life insurance companies in India over the next year or so.

## NEW GUIDELINES

Since July 2006, the IRDA has issued a number of guidelines (the most recent ones coming into effect from September 2010), that impose restrictions on the design and pricing of ULIPs. These guidelines cover:

- Standardization of the ULIP terminology, the unit-pricing (NAV calculation) approach, imposition of minimum death benefit cover in ULIPs, requirement of issuance of annual account statements to the policyholders, etc.
- Imposition of caps on the charges on ULIPs through a maximum permissible difference between gross investment return and net maturity yield to policyholders, broadly set at 3.0% (for policy tenors of 10 years or less) and 2.25% (for policy tenors beyond 10 years)
- Imposition of an explicit cap on the fund management charges (as part of the overall cap on reduction in yield to policyholder), at 1.35%pa
- Imposition of caps on the surrender charges during the first four policy years and requirements of NIL surrender charges thereafter
- Imposition of caps on surrender charges on ULIPs through a maximum permissible difference between gross investment return and net yield to surrendering policyholders, broadly set varying between 4% and 2.25% (for durations between 5 years and beyond 15 years)
- Requirement for a policy lock-in period of five years within which surrender proceeds cannot be paid out
- Requirement of a minimum guaranteed return (currently pegged at 4.5% pa) at maturity for unit-linked pension plans
- Requirement to disclose distributor compensation in point-of-sale benefit illustrations

FIGURE 1:  
WEIGHTED NEW BUSINESS PREMIUM GROWTH RATES FOR PRIVATE SECTOR LIFE INSURERS





The IRDA appears to have issued these guidelines in order to:

- Enhance value for money to ULIP policyholders
- Protect ULIP policyholders from the high surrender charges imposed by insurers in the early years of a policy, to cover the high up-front distributor commission
- Curb perceived mis-selling of ULIPs and improve persistency
- Indirectly influence insurers to lower their overall expense ratios and to improve the productivity of the distribution channels

Until the latest guidelines that restrict the surrender charges on ULIPs were issued, there had been very few universal life (VIP) products in the market. However, following the issuance of the said ULIP guidelines, some insurers had launched VIP products with the aim of paying what they believed to be a reasonable up-front compensation to the distributors.

However, the IRDA then issued similar guidelines (effective November 23, 2010) on VIP products, which amongst other things:

- Imposed a cap on the maximum commission and expense components of the premium
- Imposed a restriction on the surrender charges and implicitly disallowed the imposition of a market value adjustment (MVA) on such products

## THE IMPACT OF THE NEW GUIDELINES

As a result of the recent guidelines, the industry is currently going through a difficult period.

The caps on ULIP charges have severely constrained the ability of insurers to pay what they believe to be a reasonable front-end compensation to distributors. This, in turn, has resulted in a significant reduction

in new business volumes from ULIPs for most insurers, which until recently had been focused mostly on ULIPs.

The new guidelines have also resulted in a negative new business growth for many insurance companies, especially the private sector life insurers focused on tied agency distribution model. On the other hand, the long-established, state-owned, Life Insurance Corporation of India (LIC), continues to grow its new business volumes, given its relatively matured agency distribution model that has been selling conventional with-profits business for more than 50 years and has been able to adapt to the new environment more seamlessly.

Figure 1 illustrates the new business growth rates experienced by the private sector insurers:

Following the new ULIP guidelines, most companies have also discontinued their unit-linked pension products as companies view the required minimum investment return guarantee to be too onerous.

## WHAT NEXT?

In response to the new guidelines, life insurance companies are expected to cut back on their branch/agency expansion plans in the short term and focus more on enhancing the productivity of distribution channels and improving policy persistency. Many (including the IRDA) believe that this will be in the best interests of the industry in the long run.

In the meantime, many private sector insurers see an attraction in securing and developing large corporate distribution relationships (most notably with banks) and are focusing more on larger ticket policies, as it is considered harder for smaller distributors to survive on low commissions, especially on lower ticket ULIP policies.

Some companies are also looking to focus more on the sale of conventional products where it is still possible to offer high commission levels. However, as such products become more popular, it is likely

that the industry will need to address certain existing issues in these products, such as lack of transparency, restrictions on investments, restriction on profit sharing through the 90/10 gate in an immature with-profits fund, etc.

Although the new guidelines have significantly improved the attractiveness of ULIPs for policyholders, we believe the main issue within the industry is the way the products are sold, i.e., the distribution of business. Life insurance companies need to get their distribution model right in order to be successful in the new environment. In particular, they will need to:

- Lower the cost ratios and management expenses by cost rationalisation measures, improving productivity of distribution channels, especially the tied agency force
- Improve policy persistency rates by checking poor sales practices, improving selection of and training to the distribution channels, and through proactive policy conservation measures

It is also important for the industry to address the negative publicity attracted in the recent years caused partly due to the poor sales practices/market conduct by distributors, but also due to the lower financial literacy levels amongst different stakeholders.

Indeed, the LIC has demonstrated that in the long run, a large tied agency distribution model in India can achieve better productivity levels in a cost-efficient manner, resulting into a profitable growth for the company.

If the private sector insurers are successfully able to overcome the issues discussed earlier, they should be able to surmount the pressure on profitability imposed by the new IRDA guidelines and return to a “sustainable profitable growth” trajectory.

If you would like to discuss any of the topics raised in this article, please contact Sanket Kawatkar at [sanket.kawatkar@milliman.com](mailto:sanket.kawatkar@milliman.com) or your usual Milliman consultant.

# FINANCIAL MARKETS CORNER

## EUROPEAN VARIABLE ANNUITY ECONOMIC HEDGE COSTS – MARKET UPDATE

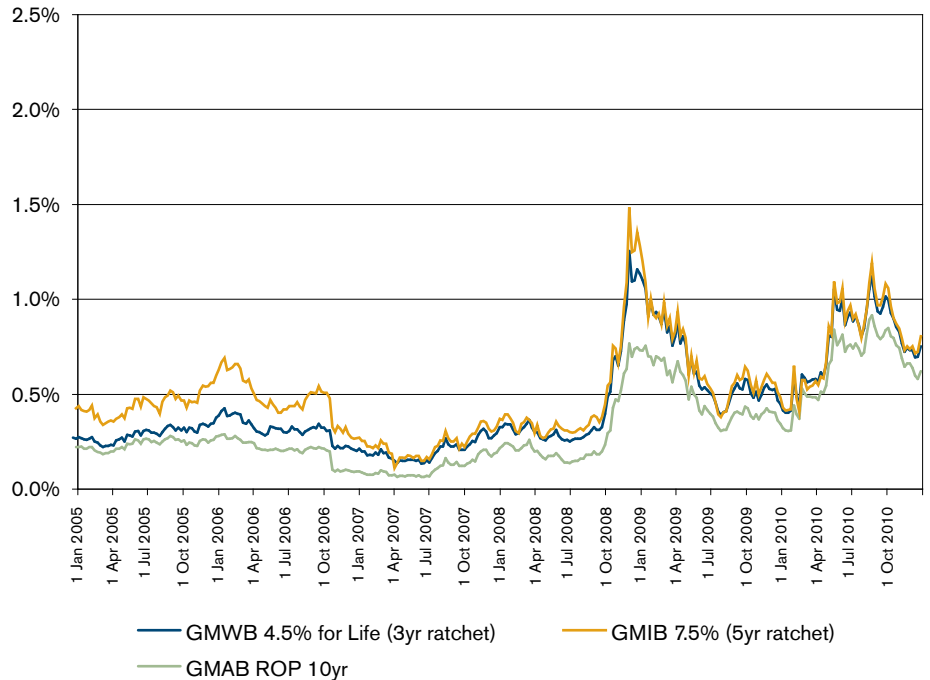
The following graphs illustrate how economic hedge costs for our typical standard example reference variable annuity products and models points have varied over the past five years, for the period ending 2010 Q4, in both the UK and Eurozone markets.

In the UK, falling interest rates and rising volatility increased hedge costs to a level just below the peak of the global financial crisis. Whereas in Eurozone, hedge costs in August reached levels not witnessed in the past five years. This was primarily driven by the fall in long-term Euro interest rates – as illustrated by the first graph on the following page – with the five-year low in 30-year Euro rates coinciding with the August peak in hedge costs. As market tensions ease into 2011, hedge costs have abated considerably, although they still remain above pre-2008 bull market conditions.

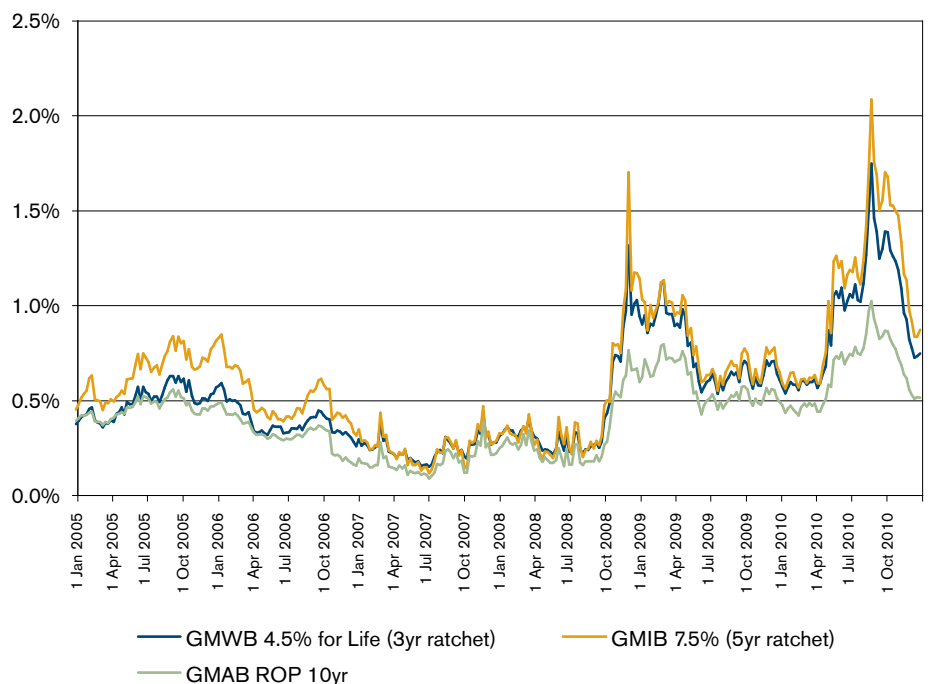
An implication of this is the need for active re-pricing of new business terms for guarantees such as on VA products. Note, however, that we have also seen companies which have been hedging rho and vega exposures experiencing significant hedge gains, thereby protecting their existing books. We expect a continuation of the product design trends identified in the article *A New Dawn for Product Innovation* in this newsletter, whereby providers are offering volatility management of the underlying assets (such as on with-profit and target volatility funds), or offering a protection strategy rather than a full guarantee or transfer of risks.

If you would like to discuss any of the topics raised in this article, please contact Gary Finkelstein at [gary.finkelstein@milliman.com](mailto:gary.finkelstein@milliman.com), Neil Dissanayake at [neil.dissanayake@milliman.com](mailto:neil.dissanayake@milliman.com), Neil Cattle at [neil.cattle@milliman.com](mailto:neil.cattle@milliman.com), Joshua Corrigan at [joshua.corrigan@milliman.com](mailto:joshua.corrigan@milliman.com), or your usual Milliman consultant.

UK EXAMPLE VARIABLE ANNUITY HEDGE COSTS



EUROZONE EXAMPLE VARIABLE ANNUITY HEDGE COSTS



EURO INTEREST RATES (SWAP CURVE ON A SPOT BASIS)



AS MARKET TENSIONS EASE INTO 2011, HEDGE COSTS HAVE ABATED CONSIDERABLY, ALTHOUGH THEY STILL REMAIN ABOVE PRE-2008 BULL MARKET CONDITIONS.

UK STERLING INTEREST RATES (SWAP CURVE ON A SPOT BASIS)



## EVENTS TO COME

MILLIMAN CONSULTANTS ARE SPEAKING AT A NUMBER OF FORTHCOMING EVENTS. IF YOU HAVE NOT SIGNED UP ALREADY, IT MAY BE POSSIBLE TO GET A DISCOUNT BY MENTIONING THAT YOU ARE A MILLIMAN CLIENT.

DATE	ORGANISER	EVENT
9 May 2011	Actuarial Profession	Financial Crisis Puts Spotlight on ERM
10 May 2011	Milliman	Milliman Expert Forum
17 May 2011	Actuarial Profession	ERM and Insurance Industry
18-20 June 2011	Actuarial Profession	Risk and Investment Conference
3 October 2011	Milliman	Milliman Expert Forum

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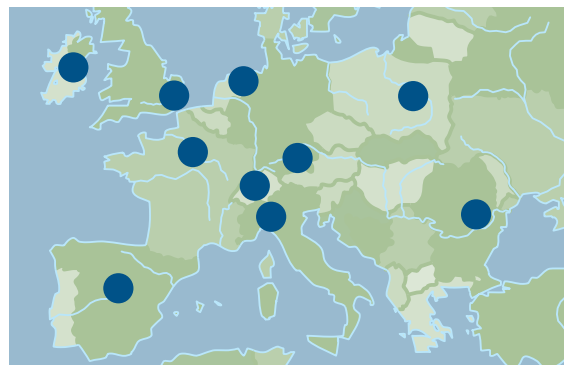
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For additional copies of the newsletter and to provide feedback, please contact your usual Milliman consultant or [carl.gaffney@milliman.com](mailto:carl.gaffney@milliman.com).

## MILLIMAN IN EUROPE...

MILLIMAN'S EUROPEAN PRESENCE HAS GROWN CONSIDERABLY IN RECENT YEARS. WE NOW HAVE MORE THAN 150 CONSULTANTS WORKING FROM OFFICES IN:

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- Bucharest
- Dublin
- London
- Madrid
- Milan
- Munich
- Paris
- Warsaw
- Zurich



We also have ambitious plans for further expansion in Europe. There are life consultants in all of these offices (totalling more than 100 consultants), and non-life and health consultants in the larger offices. Our offices work seamlessly throughout the region on topics such as Solvency II, capital allocation and embedded value review to bring multinationals a consistent service and national firms the benefits of expertise tailored to their local requirements.

## ...AND IN ASIA

Recently we have also expanded our presence in Asia and the Middle East, with new teams of experienced insurance consultants in Mumbai, Singapore and Dubai, and significant strengthening of our team in Hong Kong. Milliman has been well represented in Japan and South Korea for many years, and also has offices in Shanghai and Taipei. We will include more details in a future edition of *Issues in Brief*.

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Milliman is a firm of actuaries and consultants serving the full spectrum of business, governmental and financial organisations. Founded in 1947 and incorporated in 1957, Milliman is located in 54 cities throughout the world with over 2,500 employees including a consulting staff of over 1,300 qualified actuaries and consultants.

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