



# Newsletter

January 2011

The Society of Actuaries in Ireland

## New Qualifiers' Reception in Dublin Castle



**Back Row, Left to Right:** Colm Ryan, Linda Daly, Bernard Lee, Martin Donovan, John Joyce, Stephen Lee, Thomas Leahy, Robert Carruthers, David McCarthy, Wendy O'Dwyer McNamara, Alan Canny, Eoin King, Liam Scally, Marc Freyne, Tom Matthews, Graham Crowley and Sinead Clarke. **Front Row, Left to Right:** Jean Rea, Emer O'Byrne, Shauna McHugh, Cyra Mulvihill, Kevin Murphy (SAI President), Michelle O'Brien, Pdraig O'Maille, Barry O'Mahony, Laura Robertson and Patrick Ryan.

### Contents:

**New Qualifiers' Reception and Newsletter Team - call for volunteers . . . . . Page 1**

**The Solvency II ORSA Process . . . . . Pages 2-3**

**Risk and Reality – Decision Making in an Uncertain World . . . Pages 3-4**

**ERM and Credit Risk . . . . . Page 5**

**Unit Linked Guarantees – Harnessing the value of recent experience . . Pages 6-7**

**Backpage . . . . . Page 8**

The President, Kevin Murphy, welcomed new qualifiers, together with their families and guests to a reception in Dublin Castle on 18th November.

In addressing guests, Kevin Murphy stated that by hosting the reception in such a magnificent building, he hoped that it would demonstrate the importance of the occasion. He stated that it is an evening to celebrate and he hoped that it would be an enjoyable evening for all concerned.

Prior to presenting the qualifiers with their Fellowship parchments, Kevin encouraged them to use the designatory letters, FSAI, as by doing so he said that they would help to raise the profile and awareness of the profession in Ireland.

Kevin also mentioned in his address that he hoped that new qualifiers would become actively involved in the Society, by joining a working party or a sub-committee and by attending events organised by the Society.

He concluded his address by congratulating them on their success.

### Newsletter Team – call for volunteers

It is timely now, at the beginning of a new year, for the Newsletter Team to firstly thank all those who reviewed the many meetings that were held last year. If you were roped in to do a review, we sincerely thank you as without your support there would be no Newsletter.

It is also timely, following the reception for new qualifiers in November and the announcement of more qualifiers in December, that we encourage recent qualifiers to volunteer to review recent meetings.

With podcasts now being available for most if not all meetings, it was inevitable that the format of the reviews should change. There will be less emphasis on the actual detail of the meeting with the review giving more of a general overview, as those who want more detail can listen to the podcast. That said, we will still be looking for members to review the meetings and in this regard we need members to continue to help – we promise that if you do a review you won't be asked again for at least two years (or even longer the more members we can get to help!).

We are continually looking at ways to improve the Newsletter and would welcome any comments on the current content and suggestions for additional material - or even better, if you would like to submit something we would be delighted to receive it.

The members of the Newsletter Team are: Frances Kehoe (editor), Mary Butler, Raymond Leonard, Ciara Regan and Dave Roberts.

If you would like to review a meeting or if you have any suggestions or articles for the Newsletter, please contact Mary Butler at [mary.butler@actuaries.ie](mailto:mary.butler@actuaries.ie)

## The Solvency II ORSA Process

On 23<sup>rd</sup> November 2010, Declan Lavelle gave a very interesting presentation on the 'Solvency II ORSA (Own Risk and Solvency Assessment)'. The presentation was based on an excellent paper produced for the Society by Declan, Daniel Pender, David Roberts, Aidan O'Donnell and Dick Tulloch. It is hoped that this synopsis of the presentation will prompt the reader to read the full paper. The key objective of the paper was to bring the ORSA to the attention of the wider actuarial community and to provide a single starting point for those who wish to get up to speed quickly.

The terms of reference for the paper, set out by the working group itself, were as follows:

- To review the existing literature on the ORSA process.
- To explain the ORSA process and its place in the Solvency II regime.
- To discuss the role of the actuary in the ORSA process, covering both Life and Non-Life practice areas.
- To outline the potential contents of the ORSA process.

Declan began by commenting that, even though Solvency II was fast approaching, there are still some who are uncertain about what exactly the ORSA process is, and what it is going to mean for their business.

### What is the ORSA?

The ORSA is a key element of the Solvency II regime. Declan outlined that the ORSA was a lot more than the Financial Condition Report that we all know well. As per the CEIOPS Issues Paper from May 2008, the ORSA can be defined as 'the entirety of the processes and procedures employed to identify, assess, monitor, manage and report the short and long term risks a (re)insurance undertaking faces or may face and to determine the own funds necessary to ensure that the undertaking's solvency needs are met at all times'.

It is also important to note that the ORSA in itself does not create an additional capital requirement. It involves an assessment of the risk profile of the business compared to the assumptions used in the Solvency Capital Requirement (SCR) under Solvency II. It is not a one-off exercise or a single report; it is a documented process that will form a fundamental part of the risk management system.

### ORSA and the Internal Model/Standard Formula

Declan went on to explain that in the ORSA process, each undertaking needs to consider its own economic assessment of its capital needs based on their chosen risk tolerance and future business plans – commonly called the 'economic capital'. It is important to understand that this capital assessment is not the same as the SCR mentioned above – the economic capital may allow for a different time horizon or risk measure, for example, or indeed incorporate risks that are not allowed for within the SCR. Being a wider concept than the SCR, the economic capital assessment may well exceed the SCR but, as mentioned above, the ORSA itself does not serve to create an additional capital requirement.

Where a company is using the standard formula for the calculation of their regulatory capital requirements, the entity must evaluate the appropriateness of the formula for the specific risks of the entity and justify the use of any Undertaking Specific Parameters (USPs) or simplifications to the standard formula.

Where a company is using a full or partial internal model, they are required to evaluate the appropriateness of the model and assumptions under a number of headings e.g. model governance and scope, model calibration, statistical quality, outputs, etc. They must also include an analysis of the comparison between the model SCR and that calculated using the standard formula.

### Entity Specific Considerations

It has been recognised by CEIOPS that the ORSA could be perceived as presenting very demanding requirements for smaller undertakings. Declan explained that while the ORSA principles applied to all companies, the process should reflect the nature, scale and complexity of risks for the particular entity in question.

In relation to Groups, Declan explained that it is possible for Groups to have a single documented process for all of the ORSAs within the group. However, while Solvency II allows for Centralised Risk Management, each entity will still have its own specific ORSA.

### The Role of the Actuary in the ORSA

Declan explained that under Solvency II the formal roles of the appointed actuary and signing actuary do not exist. Indeed, technically there is no formal requirement

for 'actuaries' although the term actuarial is apparent throughout. However, as companies look for suitably skilled staff to fulfil the various roles within the Actuarial Function under Solvency II, they will inevitably turn to actuaries to be involved.

Actuaries will have clear roles in:

- Projections for the Capital Plan.
- Calibration and maintenance of the Internal model.
- Application of the Standard Formula.
- Statistical analysis for standard formula USPs and internal model parameters.

Declan also mentioned, however, that there will also be a place for actuaries within the wider risk management space (risk mitigation, ALM etc.) and in providing an important contribution to overall effective risk management.

### Contents of ORSA Process

In the final part of his presentation, Declan presented a high level overview of the contents of the ORSA process, noting that actuaries tend to be drawn towards the Pillar I and quantitative aspects of the regime. However, equally important are Pillar II (Supervisory Review / Internal Controls) and Pillar III (Disclosure) aspects.

Declan concisely documented the contents of the ORSA as a combination of themes with a short explanation of what each entails. The table opposite summarises some of these themes and some of the key aspects under each.

Greater detail on each of these themes is provided in the full paper.

### Conclusion

Declan concluded by re-affirming that the ORSA is a fundamental part of the Solvency II regime and that actuaries will have a key role to play in it. He also recommended that we all aim to familiarise ourselves with what the ORSA involves, so that we may understand how our businesses will need to adapt in order to implement the ORSA effectively and how our roles will need to evolve in preparation for Solvency II in January 2013.

The full presentation and podcast are available on the Society's website at [www.actuaries.ie](http://www.actuaries.ie).

Joanne Ryan

## Main Themes of the ORSA Process

Theme	Pillar	Some key aspects
Governance	II	<ul style="list-style-type: none"> <li>• Review of system of governance</li> <li>• Update documentation of structure, strategy &amp; objectives</li> </ul>
Risk Management	II	<ul style="list-style-type: none"> <li>• Independent assessment of risk management framework &amp; policy</li> <li>• Formal process for risk identification</li> <li>• Review stated risk appetite</li> </ul>
Underwriting	I	<ul style="list-style-type: none"> <li>• Evaluate overall underwriting and reinsurance policies</li> <li>• Review security of counterparties</li> </ul>
Investment	II	<ul style="list-style-type: none"> <li>• Review policy with respect to asset classes, limits, diversification, matching</li> <li>• Document process and review breaches</li> </ul>
Technical Provisions	I	<ul style="list-style-type: none"> <li>• Evaluate reliability and adequacy of technical provisions</li> <li>• Review assumptions, techniques etc.</li> </ul>
Solvency	I	<ul style="list-style-type: none"> <li>• Current solvency position</li> <li>• Assessment of risk profile</li> </ul>
Additional & External Risks	II	<ul style="list-style-type: none"> <li>• Assess non SCR risks (e.g. liquidity, reputational, legal, economic cycles etc.)</li> </ul>
Supervision / Reporting	III	<ul style="list-style-type: none"> <li>• Review ORSA submission process &amp; breaches of process</li> <li>• Review engagement with supervisors</li> </ul>

## Risk and Reality - Decision Making in an Uncertain World

On Wednesday 3 November, esteemed economist and financial journalist John Kay addressed the Society on the topic of "Risk and Reality – Decision Making in an Uncertain World". It was a discursive, thought-provoking and entertaining examination of the different ways of thinking about the concept of risk, and the implications of this wide-ranging definition on the decision-making process.

John began his presentation with an examination of the field of risk-modelling, a pertinent subject for the audience in question. He introduced a simple conceptual "model" – the waiting time for a bus to arrive. With an average waiting time of ten minutes, he described how the mathematical probability of a bus arriving in any given minute is one in ten. The longer the wait, the more likely a bus is to arrive in the next minute. However, he then considered a person who has been waiting fifteen minutes. This person, even reminding themselves of the stochastic distribution about the mean within the model, would eventually start to wonder whether the model was ever applicable in the first place. John described the two types of risk within any mathematical model:

1. the risks described within the model (e.g. investment or longevity)
2. the risk that the model itself is simply wrong, or not reflective of the entire spectrum of material risks which impact on the model.

He labelled the second type of risk "uncertainty", or "off-model" risk.

John described this aspect of risk-modelling with reference to Donald Rumsfeld's famous "known knowns" speech. He likened modelled risk to Rumsfeld's "known unknowns – things we know we do not know" and uncertainty to Rumsfeld's "unknown unknowns – things we do not know we do not know".

John stated that certain areas of the financial industry may be better suited than others to model risk mathematically, such as areas dealing in mortality risks. Others may be much more impacted by uncertainty, and should be wary of the over-dependence on risk-models. As an example of this, John recounted of hearing a financial services risk manager express amazement, during the tumultuous markets of 2007/2008, that their models had witnessed no less than 25  $\hat{U}$ -events in the space of a week. John remarked that with this amazement should also have

come the realisation that it was the model itself that was patently misrepresenting reality, and underestimating the uncertainty inherent in the endeavour.

This was a common theme that John would return to again: models of reality themselves are inherently approximate and, though useful for understanding and exploring the modelled risks, can never capture the full spectrum of risk – indeed if this underlying uncertainty is significant it can prove models for more extreme events spectacularly and catastrophically invalid.

John then moved on from this to explore the concept of risk more generally. John described the concept of risk as it is understood within the standard economic model, the Subjective Expected Utility model. John described this theory as the "dominant paradigm in economic and financial thought" and described how the model forms the basis for the Capital Asset Pricing Model – widely used in modern finance. John proceeded to outline the subsequent movement of "Behavioural Economics" – which ascribes deviations from rationality in the standard model to some class of cognitive error (or "temporary stupidity") on the part of the individual which would eventually revert.

continued

## Risk and Reality - Decision Making in an Uncertain World....cont

John explained the genesis of his own scepticism of the standard model and its variants, and their treatment of risk. The first was his visit to London's affluent casinos to witness successful businesspeople losing heavily, evidently making huge miscalculations of the risk of loss versus the potential rewards. He noted that people, even financially and numerically literate people, may be "persistently irrational" when it came to estimations of risk, an observation that is not explained by the standard model or its variants.

The second event that shook his faith in this model was conversations with Lloyd's underwriters following the Piper Alpha North Sea oil disaster in the late eighties. He described how, following the disaster, heavy losses were incurred on investments that had been assumed to have little exposure to such a risk. The underwriters in question spoke of their surprise that there had been such a frothy market for these investments prior to the disaster, given the risks being assumed. Clearly the investors, unlike the underwriters, did not understand the risks that were being taken on.

John described how these two examples show that not only can estimations of risk be persistently miscalculated due to cognitive error, but risk can also be perceived as being much lower than it is due to deficits in understanding the underlying reality.

John outlined his contention that many financial products exploit these mis-estimations of risk by the general populace, either through product design that focuses on risks that are perceived to be real but may statistically not be so, or by concealing the true reality of the risks underlying the products. As examples of the second class, John spoke of the abovementioned Piper Alpha oil disaster, and also the securitised sub-prime losses of 2008/2009.

John moved on from this aspect to a new theme – explaining how the concept of risk itself can be defined differently in different contexts, and how probabilistic measures can often give radically different results from other methods of defining risk, and the decisions consequently made on this basis. John described another real-world definition of risk – the legalistic definition ("beyond reasonable doubt", "on the preponderance of the evidence") and how the decision-making process can

differ depending on which definition of risk is chosen.

By way of an example, John described the "Rodeo" problem – a rodeo event with 1,000 seats, for which 499 tickets have been sold. Due to an unforeseen hole in the fence, all 1,000 seats are occupied for the show, 499 ticket-holders and 501 freeloaders. The owner sues everybody in attendance for the price of the ticket since, on the basis of probabilities, an attendee chosen at random will have been found to have crawled through the hole in the fence ( $P = 0.501 > 0.5$ ). John pointed out that the probabilistic model would support the owner's claim, but it is highly unlikely any court of law would come to the same conclusion. Thus we have different logical conclusions depending on differing definitions of risk – a probabilistic definition and a legal definition.

John outlined his contention that in real life, just as in the legal sphere, people tend to consider risk and uncertainty in terms of narrative, and degrees of confidence in narrative. This is as opposed to the method of attaching probabilities to potential outcomes, which actuaries would be most familiar with.

John concluded his presentation by stating that there is no one "right" way of thinking about, and defining, risk. Moreover, different definitions of risk may lead to different conclusions in the decision making process. Some definitions of risk may be more suitable in certain contexts than others, and it needs to be borne in mind that the mathematical approach to modelling risk is not always appropriate.

An interesting Q&A followed, with some pertinent issues raised for actuaries dealing with the risk-modelling aspects of Solvency II.

John was asked his opinion on the appropriateness of Solvency II's focus on the mathematical modelling of risk, and whether a better method than 1 in 200 year ruin-event probability could be devised.

John conceded that Life Assurance had proved itself better suited to using mathematically-based risk models than, say, the Banking industry. However he repeated his warning of over-reliance on models. He stated that he did not propose we abandon such models, but use them merely to help explore the risks faced by a

business – not to define them. He stated that at all times the limitations of these models should be understood. He outlined his contention that when an extremely adverse, ruinous event does occur in the future it is likely to be caused by factors that were not modelled by the industry. He stated he regretted the enshrinement of prescribed risks in Pillar 1, and expressed hope that the ORSA evaluation in Pillar 3 would not become a similarly list-based audit-trail exercise.

The evening concluded with the President Kevin Murphy extending warm thanks to John for an entertaining speech which had given much food for thought to all those in attendance.

The podcast and a copy of the slides are available on the Society's website.

Vincent Kelly

# ERM and Credit Risk

On the 11th of October 2010, as part of the Society's ongoing series of presentations in relation to Enterprise Risk Management, Niamh Crowley and Niall Dillon presented on the timely topic of ERM and Credit Risk. Niall is currently working in Anglo Irish Bank while Niamh works on the credit risk team in Irish Life.

The aim of the presentation was to provide a foundation on credit risk to those new to the topic, and to give an indication of some of the content of the new ST9 CERA exam. It touched on approaches to modelling and measuring credit risk, credit risk management/mitigation and regulatory capital requirements relating to credit risk.

Niall began the presentation with a definition of credit risk. He reminded the audience that credit risk covers all of the following:

- the risk of non-payment;
- the risk of late payments; and
- the risk of deterioration in asset values on a company's balance sheet as a result of a perceived change in the credit worthiness of a creditor.

He quoted many examples of credit risks from both an insurance perspective and a non-insurance perspective, including the risk of default on unit linked cash deposits, reinsurance recoveries and corporate bonds.

Niall then moved on to elaborate on the concept of a credit spread. He defined it as the payoff required for taking on an asset with a higher credit risk, measured as the difference between the yield on a risky asset and the yield on a risk-free security.

There are three common measures of credit spread within the markets:

1. Nominal spread – the difference between yields on risky bonds and risk-free bonds of similar terms;
2. Static spread – the addition to the risk-free rate such that the discounted present value of the cashflows from risky bonds equals the price of the bond;
3. Option-adjusted spread – further adjustments to the spread for any bond optionality via stochastic modelling.

Niall explained that credit spread levels visible in investment markets reflect:

- the expected probability of counterparty default;
- any risk premium attached to the risk of counterparty default; and
- a liquidity premium.

He then used some colourful graphs to demonstrate the historic 10-year spreads on government bonds relative to the German Bund which, to no-one's surprise, showed large spikes for Ireland and Greece in 2010.

Niall then discussed various methods of mitigating credit risk, suggesting the use of a risk based pricing approach (charging higher interest to borrowers likely to default), collateral, diversification, credit insurance or derivatives.

Niamh then took the baton and educated us on how to go about modelling credit risk. The basic premise is to model the loss event as:

$EAD * PD * LGD$ , where:

EAD = the exposure at default

PD = the probability of default

LGD = the expected loss percentage given default

Niamh considered the potential difficulties associated with trying to quantify the above three items. For retail exposures the probability of default can be derived from internal grading systems, observational data or behavioural scorecards which require lots of resources. The probability of default for corporate exposures can be derived from the credit spreads sourced from S&P \ Moodys \ Finch. A comment from the audience highlighted that these spreads can be used to determine the perceived probability of default as opposed to the actual probability of default - for example Irish banks had low credit spreads in 2008 when they were in fact on the verge of collapse.

There are two classes of default probability models. The first is a firm value model (e.g Merton Model) which assesses a company's credit by characterising its equity as a call option on the assets. The most common firm value model used in industry today is the KMV model (Kealhofer, McQuown, Vasicek) model which descends from Merton. The second class of model is a credit migration model

where the methodology is based on the probability of moving from one credit quality to another within a given time horizon (credit migration analysis).

Niall then briefed us on Credit Default Swaps where the buyer of a CDS pays a premium to the seller so that in the case of a negative credit event, the seller takes on the credit loss. They were first introduced by JP Morgan in 1995. The CDS market reached its peak in 2007 when it was estimated to be worth \$60 trillion. Niall noted the comment of an AIG executive at this time that "It is hard for us, without being flippant, to even see a scenario within any kind of realm of reason that would see us losing one dollar in any of those transactions." AIG ran a one-way book consisting almost entirely of sold CDS protection. Their failure to correctly price the credit risk that they were taking on, and to set aside adequate capital to cover possible payments on these contracts resulted in the near collapse of AIG in 2009.

He finished the presentation by giving an overview of ways for companies to manage their credit exposure, in particular stressing the importance of having a clear credit risk policy that specifies the credit risk framework of the organisation.

The slides presented by Niall and Niamh and a podcast of the meeting are available on the Society's website.

Orla Walsh

## Unit Linked Guarantees

James Maher gave a presentation on Thursday 21st October to the Society of Actuaries in Ireland entitled "Unit Linked Guarantees – Harnessing the value of recent experience". The presentation was based around two papers, together with updates on recent regulatory developments for unit linked guarantees.

The two papers discussed were as follows:

1. An executive's handbook for understanding and risk managing unit linked guarantees.
2. OTC Option Pricing for Insurers.

Both of these papers are available on the Society of Actuaries' website.

### An executive's handbook for understanding and risk managing unit linked guarantees

This paper was co-authored by James with other members of the "Variable Annuity Member Interest Group" – a UK actuarial committee. The purpose of the paper was to consolidate recent experience in the unit linked guarantee market and provide an overview of the risks and risk management considerations required in the design and manufacture of unit linked guarantees. In summary, to provide a view from "the Balcony" for all executive directors to understand the products. James started by outlining a range of products sold by life insurance companies which have varying degrees of market risk and insurance risk passed onto the financial institutions. Having outlined the range of products available, the presentation narrowed its focus to variable annuity (VA) style products as this has a wide range of market risk and insurance risk contained within the one class of product. Various risk mitigation techniques are available to financial institutions to help mitigate these risks.

Each party involved in the production, sale and management of VA products will have different concerns arising from the VA product. For example, the distributor will be thinking of how secure the supply of these contracts are compared to the reinsurer thinking of the full replication cost for any VA business that is ceded to the reinsurer.

There are many pieces to be considered in the management of VA business, ranging from administration, liability management, risk management and hedging and operational governance. It is important that each of these is considered in the

same picture to ensure that the business is managed effectively. Each of these brings their own management challenges in the production of VA business. Elements of this can include the following:

- Expertise – have we the appropriate expertise to design and manage the VA business?
- Infrastructure – have we the correct systems in place to manage the business?
- Capital – what levels will be required and how will this be generated?
- Governance – how will we manage this internally?
- Distributor – have we the correct channels set up to sell the business?
- Others - including Markets, Agents and Clients.

There are alternative methods of managing each of these challenges, e.g. on a centralised or decentralised basis. Is outsourcing required?

Other items that will have to be considered as part of the management of this business will include environmental issues, e.g. the tax and capital implications of where the business is based and the regulations applying to the business.

Internal issues will also need to be considered, e.g. how this potentially under/over laps with existing business. The main risks associated with this business can be broken down as follows:

- Market risk – first order (readily hedgable) and second order (difficult to hedge), e.g. convexity and term structure;
- Behaviour risks - including lapses and withdrawals etc;
- Demographic risks;
- Other.

With regard to consideration of the overall risk picture, it is important to keep in mind operational risks, especially where dynamic hedging is put in place. Additional risks will also arise from entering into any risk mitigation transactions.

Thinking of VA business from a capital perspective, the imminent Solvency II picture will need to be fully understood. James outlined that there may be no need for a new Solvency II model but rather an extension of the Standard Formula. There will be new risks included (e.g. basis risks or liquidity), other risks extended or amplified (e.g. default or market) and

other risks altered (e.g. behavioural).

Risk mitigation is an important element in writing this business. For VA's with guaranteed minimum withdrawal benefits (GMWB), using a mixture of the QIS4/5 calibrations, James stated that there would be greater than a 10% day one capital charge for writing an unhedged GMWB. It was self evident that such a capital consumption would not be viable or sustainable in any meaningful volumes. This level dropped to approximately 8% and 3% when a delta rho or 3 Greek dynamic hedge programme is put in place. If we look at a static hedge program, credit risk is an important consideration. From a capital perspective, the counterparty would require to be rated at a minimum BBB level for the solution to be viable.

### OTC Option Pricing for Insurers

James Maher is the sole author of this paper. This is the more descriptive of the two papers which enters into the derivation of option pricing, particularly with regard to market liquidity, for insurers and how there can be a pricing mismatch between insurers and banks.

For products with guarantees exposed to market risk, insurers can decide to hold, transform or transfer the market risk. The transformation of market risks leads to the hedging discussions. There is a fundamental disconnect between the transformation (replication) pricing of the risk compared to the insurers perspective. The transformation of risk shortens the liability profile and introduces liquidity risk. The main feature of the management of market risk is that all roads lead to dynamic hedging.

James outlined the Black Scholes formula in an ideal world and the real world. In the real world, there are a number of adjustments required to be made to the formula we all learned as part of actuarial exams. These are as follows:

- The volatility ( $\hat{U}$ ) parameter is exchanged for the implied volatility;
- $R_r$  for  $R_f$  to reflect the "repo rate" ;
- $R_c$  for  $R_f$  to reflect the earned rate on the cash investment.

### Implied Volatility

This is defined as the "inferred parameter given a known option price". This is definable for exchange traded options but less transparent for OTC options. This will include adjustments for :

## – Harnessing the value of recent experience

- Transaction costs – i.e. cost of rebalancing the hedge will lead to higher implied volatility assumptions the more frequently it is rebalanced. This has a larger impact the less liquid the underlying asset.
- Discrete time hedge error – e.g. the more volatile the assets, the increase in the discrete hedging cost error.
- Market equilibrium - as bid/ask prices go up and down.

### Repo Rate

The repo rate is the rate of interest on a collateralised lending agreement where an asset is temporarily sold with a requirement to repurchase at a later date. Similar to the implied volatility parameter, the less liquid assets will have higher repo costs and so higher option prices.

The discount rate used in the calculation of the Black Scholes formula requires further discussions given the movement of the overnight interest swap (OIS) rates and the LIBOR swap rates during the crisis. Pre the crisis these had been relatively stable (within 10bps) while post crisis the LIBOR is greater than the OIS rates. James raised the query that there may be a situational discount rate required which reflects the option sellers investment freedom with an additional adjustment for risk.

To combine all of the above, James showed an illustrative OTC option price for varying terms. This showed that allowing for each of the liquidity considerations, the aggregate premium over the theoretical option price is in the order of 20%-25%. This margin increases with term and the level of liquidity in the markets.

### Regulatory Developments

In the final section of James's presentation, he discussed the regulatory developments of VA's with regard to CP42 and Solvency II. The CP42 related to both risk and governance for VA companies and is expected to be convergent with Solvency II. There remains a number of issues to be discussed for VA companies under Solvency II, including dynamic hedging versus hedges, counterparty risk and market consistent pricing. James outlined that the CEIOPs VA taskforce will be issuing a consultation paper (CP83 published end November 2010) with consultation open until February 2011. Mark Burke, from the Central Bank of Ireland, also provided an update from the

regulator stating that they have a final paper to be issued following the feedback from CP42 and that this paper is expected to be in force from March 2011. In addition, all VA companies will receive a letter outlining additional reporting requirement for year end 2010.

### "The Magnificent Seven" - 7 Key Themes

James's final section brought out the 7 key themes in the management of VA business using the "The Magnificent Seven" actors as icons for each. The 7 key themes were as following:

1. You have to ensure security of supply;
2. You need to appreciate the full cost of replication;
3. Big is beautiful (i.e. scale if rewarded);
4. Design products with risk mitigation inside;
5. It is a risk business, not a spread business;
6. Don't lose sight of the second order risks;
7. Clarity of purpose is key.

This brought an end to James's presentation. A Q&A session followed with many interesting questions raised by the audience. For example, should companies hold capital for volatility in repo rates, how much of the costs outlined in the hedging are actually completed in practice and is full replication actually completed in practice?

Papers, the presentation and a podcast are available on the Society's website for those who were unable to attend this interesting session. These papers have subsequently been presented to the UK Actuarial Profession and will be published, along with transcripts of those meetings, in the British Actuarial Journal.

Eric Brown

## Student Society Wine Tasting Evening

Students of the Society met on November 4th in the basement of D2 for the second Wine Tasting event. Experienced connoisseurs were joined with young graduates, fresh out of college and still adjusting to working life, for an evening of wine appreciation.

The expert for the event, Cameron, guided the students through the intricacies of wine tasting, pointing out the various hues and hints of flavour in

each different wine. The new world wines were compared to those produced by the more traditional wine producing regions and histories were given for each region. Attendees were also told what to look out for and what to avoid when matching wines to different dishes. Most crucially of all, students were told what to say if they knew nothing about wine; the three magic words: "It's well balanced".

When the tasting had finished, students enjoyed refreshments in the upstairs area and spent the rest of the evening involved in discussions on actuarial and non-actuarial issues. It proved to be another enjoyable night and hopefully this event will continue into the future as a regular feature on the student events calendar.

Donal Murphy

## Annual Table Quiz



The winning team at the Society's Annual Christmas Table Quiz *L to R*; Liam Dempsey, Lee Smith, Dan O'Mahony, Kevin Manning (Quizmaster), Patrick Meghen & Eamon Comerford (scorers) and Aidan O'Callaghan.

While numbers were down due to the inclement weather conditions, many members succeeded in getting to the Alexander Hotel, clad in snow boots, ice grips and various combinations of ski gear. The President, Kevin Murphy, arrived safely in order to join members for Christmas Drinks and to convey Season's Greetings.

The now traditional Christmas Table Quiz followed the reception. Also, the now traditional quizmaster, Kevin Manning, once again did the honours by posing some intriguing questions and getting even more interesting answers! As always, the Society is most grateful to Kevin for his continued support of our Quiz.

The winning team of Liam Dempsey, Dan O'Mahony, Aidan O'Callaghan and Lee Smith had the privilege of choosing the charity to whom the proceeds of €2,000 have now been donated. They chose St. Francis Hospice in Raheny.



### DID YOU KNOW?

When you are logged on to [www.actuaries.ie](http://www.actuaries.ie) /My Certificates, if you hold a practising certificate, you can view the status of your certificate(s).



### DID YOU KNOW?

When you are logged on to [www.actuaries.ie](http://www.actuaries.ie) /My Reservations, you can create a CPD return. The maximum number of hours as stated on the Events Page will automatically be shown under 'Total Hours' on your CPD return. Members can then decide how much is e.g. Relevant, Technical, Professional etc.

## On the Move

### Fellows:

**Sinead Kiernan** has moved from PMI Europe to **Deloitte**

**Joanne Roche** has moved from PwC to **KPMG**

**Denis Lyons** has moved from Towers Watson to **Aon Hewitt**

**Eoin Murphy** has moved from Hartford Life to **Aviva**

**Ciaran Belton** has moved from Aviva to **KPMG**

**Tomas Scullion** has moved from Aviva to **Generali Pan Europe**

**Vincent Kelly** has moved from Irish Life to **AXA MPS Financial Limited**

**Jim Liston** has moved from Allianz to **Travelers Insurance Company**

### Students:

**Jennifer Johnston** has moved from Standard Life to **Acumen Resources**



**Society of Actuaries in Ireland**

102 Pembroke Road, Dublin 4. Telephone: +353 1 660 3064 Fax: +353 1 660 3074 E-mail: [info@actuaries.ie](mailto:info@actuaries.ie) Web site: [www.actuaries.ie](http://www.actuaries.ie)