



Society of Actuaries in Ireland

Current Topics 2012

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1 Foreword

Welcome to the Society's 2012 Current Topics paper. This continues a series which started with the first Current Topics paper in 2001 (presented in 2002) and it serves two purposes:

- It gives a group of newly qualified actuaries a great opportunity to prepare their first paper for their professional peers; and
- It consolidates in one document the key current issues facing actuaries in our main areas of practice.

Those who have contributed to this year's paper are:

- **Life Insurance:** Teresa Bradley, Alan Canny, Thomas Donegan, Ciarán Kelly, and Dave O'Shea,
- **General Insurance:** Graham Crowley, Mary de Burca, Kevin Humphreys, Majella McDonnell, and Alan Tiernan,
- **Pensions:** Peter Gray and Paul Torsney,
- **Investment:** Mary Dillon and Emmet Leahy.

The paper was co-ordinated by Tracy Gilbert with assistance from Maeve Fleming. A huge amount of work has gone into this enterprise and I would like to thank everybody involved for their time, energy and commitment.

The paper provides an excellent record of the main issues facing actuaries in 2012 - our 40th anniversary year - both for current use and for posterity. I can't help but wonder though what someone reading it in 40 years' time - maybe one of the authors themselves! - will make of the world we practice in today.

Happy reading.

Paul O'Faherty
President of the Society of Actuaries in Ireland

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2 The Eurozone Debt Crisis and Its Impact

Introduction

It's hard to know exactly what is going on at any given moment with the Eurozone Debt Crisis – the authors of this paper don't know, the Irish government doesn't know, economists don't know, Angela Merkel doesn't know, even the markets don't know.

The aim of this section of the paper is to:

- summarise what has happened to date with regard to Sovereign Debt,
- outline how a member state could potentially leave the Euro using Greece as an example, and to
- identify the main risks and fears specific to insurers as a result of the on-going Eurozone debt crisis.

Since the current financial crisis began, market movements have been an unending source of headache for companies involved in the Financial Services industry. The shift in market focus from individual financial institutions to the finances of Sovereign nations is an issue of particular concern and uncertainty and it continues to evolve as we write this paper.

2.1 Evolution of a Crisis

2.1.1 Brief Overview of Credit Crunch

In late 2007, the global financial system was facing meltdown, as the effects of the “Credit Crunch” took hold on the global economy. In essence, the crisis stemmed from the issuance of loans to poor quality borrowers. These loans were then collateralised into financial instruments by the issuing institutions and sold on the secondary markets. The manner of transferring risk meant that many institutions were exposed to losses on such instruments and inter-bank lending dried up over fears as to the soundness of other institutions. This caused a deceleration in the global economy.

After Lehman Brothers was allowed to collapse in late 2008, the situation worsened. Many sovereign states were obliged to step in to save their banks from collapse.

2.1.2 Sovereign Debt Crisis – Key Events from 2010 to 2012

Following on from the above, as bank lending to businesses decreased, business activity slowed in many countries. This led to many countries entering a recessionary period.

Over time, it became apparent that many countries had very high levels of debt, but that their current income was insufficient to simultaneously service existing debt and maintain state expenditure. Hence, for certain countries, fears arose over the debt that those countries had issued. In times of easy credit, there were no concerns about the sustainability of debt that was issued by governments. However, the credit crunch seemed to have

changed the mind-set of institutional investors somewhat, and fears began to rise over the levels of debt for many EU states.

Throughout the crisis, politicians have aimed to prevent contagion, where the inability of one country to finance itself on the markets leads to an inability for another to finance itself. It was hoped that the actions taken at each point in time would help avoid this.

Greece was one of the first countries to fall victim to these fears. Existing high ratios of debt to GDP plus revelations that poor accounting practices had caused the Greek state to understate its deficit in 2009, led to an inability for Greece to raise funds from the capital markets.

May 2010

In May 2010, Eurozone members and the IMF agreed a formal €110bn bailout for Greece. Although Greece had instigated austerity measures in advance of that date, the measures themselves had not proved sufficient. The bailout was agreed to enable Greece to continue to operate its public sector services and also to service the existing debt it had issued. The bailout had strict conditions relating to the austerity measures that had to be implemented prior to funds being released.

As a response, the EU established the EFSM and EFSF (European Financial Stabilisation Mechanism and European Financial Stability Fund) to assist any additional countries that encountered such problems. It was hoped that the creation of such agencies would ease market fears that other countries would need help. The EFSM and EFSF are discussed in further detail in Appendix A.

November 2010

In November of the same year, an €85bn bailout was agreed for Ireland. Part of the Irish bailout funds was to be used to stabilise the Irish banking industry, with the balance being used to fund budget deficits. €67.5bn of the total came from the EU/IMF and bilateral arrangements with the UK, Denmark and Sweden. The remaining €17.5bn came from the National Pensions Reserve Fund.

First half of 2011

In May 2011, after much speculation as to whether or not it would be required, a €78bn bailout was agreed for Portugal.

Over H1 2011, fears also began to escalate about Spain and Italy. The big worry was with respect to the sheer scale of Italy's debt, over €1.3tn. Existing EU measures, in terms of the EFSM and EFSF, would have been (and still are, to a certain extent) unable to cope with an Italian bailout.

The European Central Bank (ECB) stepped in, agreeing to buy Italian and Spanish debt, in order to lower their costs of borrowing. The ECB had never taken such direct actions before.

Second half of 2011

In July 2011, an additional €109bn bailout was proposed for Greece. A particular feature of the new bailout was that it called for private sector involvement in the bailout. In effect, this ultimately led to holders of Greek debt taking a “haircut” on the value of their holdings, by either lengthening the term of existing holdings or receiving less back. The involvement of the private sector had to be on a “voluntary” basis to avoid the restructuring of the debt being classified as a “Credit Event”. Had the restructuring been classified as such, any credit default swaps (CDSs) purchased for Greek debt would have been obliged to pay out.

Initially, the CDS contracts did not have to pay out. The International Swaps and Derivatives Association (ISDA) did not classify the restructure as a “Credit Event”, as, despite bondholders taking losses of up to 50%, participation was voluntary. However, Greece subsequently invoked a legal clause making the reductions mandatory for all private bondholders; the ISDA panel immediately moved to trigger the CDS payments.

In October 2011, the ECB issued unlimited one-year loans to banks operating in the Eurozone, with the aim of providing liquidity that banks were finding difficult to obtain from other sources. Such “liquidity injections” are called Long Term Refinancing Operations (or LTROs), and are typically issued for terms of three months to one year. In December 2011, the ECB began issuing three-year LTROs.

In December 2011, the “Fiscal Pact” was agreed. This is a treaty amongst member states that made it harder to violate strict budgetary rules. The treaty itself was later put to a referendum in Ireland and successfully passed. The treaty needs to be ratified by 12 member states before it comes into force. At the time of writing 8 member states had ratified the treaty. It’s worth noting that the UK and the Czech Republic have opted out of the pact.

First half of 2012

On the 13th January 2012, S&P downgraded many European countries. The countries affected were Austria, Cyprus, France, Italy, Malta, Portugal, Slovakia, Slovenia and Spain. This confirmed what everyone was thinking – attempts to stabilise the crisis and prevent a contagion from the peripheral economies to the larger core economies had not been successful.

In particular, France and Austria lost their AAA rated status, being downgraded to AA+. They were also given a “negative outlook”, meaning there was a 30% chance of a further downgrade. At the time of writing, there has been no such downgrade.

Over Q1 2012, there were weeks of discussions between the Greek government, the so-called “Troika” (comprising the International Monetary Fund or IMF, the ECB and the

European Commission) and private investors in Greek debt, represented by the IIF (Institute of International Finance). These discussions achieved the desired reduction in Greek debt, which was reported to be in the region of 50-60%. Following these talks, the Troika formally agreed to ratify the second Greek bailout, which had been initially proposed in July 2011. However, the amount involved in the bailout was increased from €109bn to €130bn.

Also, Greek parliamentarians passed the required austerity measures. However, over 40 deputies of the coalition parties that were in government were dismissed for failing to back the Bill. The dissent shown here was echoed by the Greek populace, who had protested widely against the austerity measures and bailout throughout the crisis. These events did not bode well for the upcoming general election, which was to take place a few months later.

Over the next few months, Spanish and Italian yields fluctuated, but the countries still successfully managed to issue new debt on the capital markets. It is difficult to say whether these successful issues were due to market sentiment or due to the issuance of the previously mentioned LTROs. The LTROs could have had some role to play here, as Financial Institutions used cheap finance to buy higher yielding government debt.

In May 2012, Greek general election results saw a large increase in support for parties who were not in favour of the bailout programmes. This saw fresh speculation that Greece would choose to leave, or be forced from, the single currency zone. However, a coalition could not be successfully formed and fresh elections were set for the 17th June. Throughout the crisis, there had always been fears that Greece or one of the other peripheral countries may be forced to leave the Euro, but fears regarding Greece escalated due to the election results.

Shortly after the Greek election, Bankia, Spain's fourth largest bank, announced that it had asked the government for a bailout worth €19bn. Less than two weeks later, Spain announced that it was to seek up to €100bn from Eurozone funds to go directly towards its banks.

While this saw yields rise on Spanish debt, it looked favourable for Ireland, as it was hoped that Ireland could renegotiate part of its bailout and get Eurozone funds invested directly to Ireland's banks. This would effectively reduce the outstanding debt burden of the Irish state. Irish bonds yields fell on the back of hopes that such an agreement could be reached.

The second Greek election was held on the 17th June; following the results, a coalition government of pro-austerity parties was successfully formed.

June 2012 to October 2012

Over June and July, rumours abounded in the financial press about Spain needing a bailout of up to €300bn. However, despite these rumours, Spain had a successful debt issuance in July, albeit at higher yields than in earlier months. If we look to the future for a moment, it's worth noting that provided Spain is able to continue to finance itself through such debt issues, it will not need a bailout.

Ireland commenced the return to the bond market in July/August 2012:

- €500m of Treasury bills was successfully issued in early July,
- €5.23bn was raised towards the end of July by issuing new long-dated bonds (maturing in 2017 and 2020) and offering switches from existing shorter-dated bonds to the longer bonds,
- €1.02bn was raised through the issuance of amortising bonds at the end of August.

While the amounts involved are small relative to Ireland's overall debt, it did reflect the positive sentiment that Ireland had managed to gain from global investors.

Mario Draghi, head of the ECB, issued a statement in early August advising that the ECB is preparing a new bond buying programme, but that it would only apply to governments of countries that had entered formal programmes with the EU bailout funds. Market reactions to this statement were negative – Italy in particular was pushing for further ECB direct intervention in bond markets, in order to reduce sovereign yields.

Reports in the Financial Times in early September indicated that the Templeton Global Bond Fund, a fund managed by Franklin Templeton funds in the United States, had €6.1bn in Irish Government bonds as at the end of June 2012. The accumulation of this portfolio over the past year could have been a significant driver in the fall in Irish yields observed over 2012.

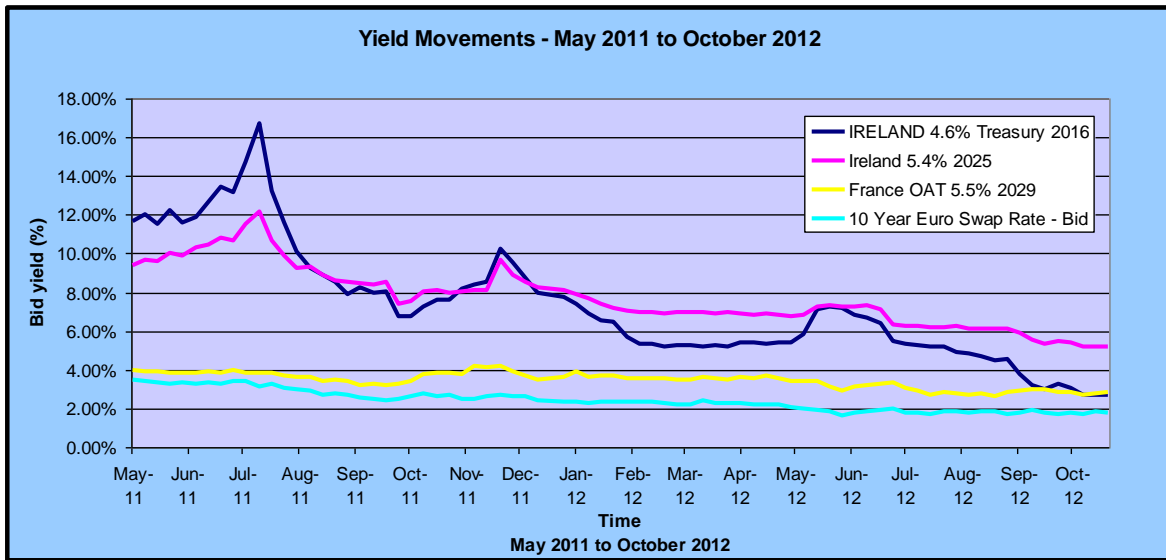
On Thursday 6th September, Mario Draghi formally announced an ECB bond buying plan, which would see the ECB intervene in the debt markets by purchasing government bonds. As indicated in earlier announcements, this action would only be performed where the country in question had formally entered into arrangements with the bailout funds to tackle underlying economic problems. However, the amounts involved could be potentially unlimited. Spanish and Italian yields dropped sharply as a result.

On the 11th September, the IMF boosted the case for Irish debt relief. Its latest report stated that investment in Irish banks by the ESM could “transform the public debt outlook, cut the bank-sovereign link, and cement a needed win for Europe”. Dutch, German and Finnish finance ministers issued a statement later in the month resisting such a move, but as yet it appears that no clear decision has been made in relation to this.

On the 12th September, the German constitutional court, the Karlsruhe, ruled that German ratification of the treaty which facilitated the creation of the new Eurozone rescue fund could proceed. This enabled the inauguration of the ESM to take place in October (see Appendix A for further details on the ESM).

Over September and October, rumours abounded in the financial press of Spain preparing to request a bailout, but no such requests materialised.

The graph below shows the volatility of sample Irish and French bond yields over the last 17 months. The 10-year euro swap curve is included as a reference point.



2.2 Potential Exit from the Euro – A Greek Case Study (“Grexit”)

2.2.1 Background

Throughout the crisis, the possibility of a member state exiting the Eurozone has been the focus of media attention. Greece in particular has received much of the attention, as its problems appear to be the most serious.

This section of the paper considers what could potentially happen if Greece were to leave the Eurozone. It is worth highlighting that such a discussion is highly subjective.

The Maastricht Treaty itself paved the way for the creation of the single currency. Perhaps an oversight of the writers of the treaty and of those who created the euro was that it was never considered that a country may actually decide to leave the euro. There is no planned, defined or methodical way in which such an event could happen. The treaties have a provision for leaving the union, not just the euro alone; should Greece leave the euro it may have to negotiate continued EU participation.

2.2.2 How could Greece leave the Euro and what would it look like?

If Greece were to exit the euro, the following is a possible stream of events, supposing the exit occurs in an orderly fashion and is announced before it happens.

- The currency of Greece prior to the euro was the Drachma. It is likely that the Greek government would announce the intended exit date, and when the Drachma would once again be legal currency. In advance of that date, the Greek Central Bank would be obliged to start minting Greek currency once again.
- Prior to the re-introduction of the Drachma, the Greek state would peg the currency to the euro. This rate could be the equivalent to what it was at the outset of the euro, but it is more likely that a simpler one to one ratio would be established.
- While the government and Central Bank may desire to maintain this peg post-“Grexit”, historical case studies show that maintaining a fixed currency peg is very difficult, especially when most parties trading in the currency would be expecting it to devalue rapidly. It is likely that such a peg would not be sustainable.
- Deposits in bank accounts would be converted from euro at the prevailing rate on day one of the exit. There would be a possibility that accounts get frozen when the exit is initially announced, so as to prevent a run on already struggling Greek banks.
- Upon return to Drachma, currency trading would likely see the Drachma rapidly depreciate against other currencies. This would see the cost of imports rise quite rapidly – part of the problem Greece faces is that it is not, like Ireland, an export-driven economy, so it would not see much of a gain in competitiveness as a result of the devaluation.

- The Greek government would likely decide to convert existing outstanding sovereign debt to Drachma rather than retain in Euro terms. Given high existing levels of Greek debt, it would like to reduce its existing debt as much as possible. Hence it may even consider outright default. ECB and EU pressure has been aimed at protecting and maintaining the single currency, and talk of an outright default has been dismissed as it could cause contagion fears for other countries. With the withdrawal of such pressures, the Greek government may decide that such a default is a possibility and refuse to further service existing debt. This default would affect both institutional investors as were represented by the IIF above, but would likely also affect monies received from the EU and IMF.
- Even if Greece did default on all its debt, it still retains a deficit, in that tax income is not enough to cover expenditure. Further austerity measures would be required, just to balance the books. Except now, there would be no EU/EC/ECB/IMF to blame for the measures being taken.
- With no further possibility of bailout funds from the EU or from the markets, the Greek state will not be able to borrow to finance public service wages, healthcare, pensions etc. Its only option would be to print additional currency. However, such printing of currency would lead to inflation.
- The combination of an increase in costs of imported goods due to currency movements and the increases due to increases in the money supply would cause severe social disruption. It is likely that social unrest could occur.
- If the Government could convince people to accept the sharp drop in living standards that the exit would entail, and then start growing the economy again from this position, it is possible that the economy could rebound eventually. However, the danger here is that the government initially tries to avoid austerity or falls in living standards by printing more money, which then exacerbates the original problems.

For other countries within the Eurozone, it is impossible to say what might happen.

It is worth bearing in mind that over the last two years the financial press widely reported that many European banks had large holdings of Greek debt. While they may have gradually wound down such exposures, should Greece leave the euro, any remaining holdings would rapidly fall in value. The knock-on effects within the financial services industry across Europe are impossible to gauge, but could be severe.

EU leaders have been striving to avoid contagion throughout the crisis. To a certain extent, contagion has occurred. Greece leaving the euro may see the end of the troubles for what is left of the Eurozone, as Greece's problems are more severe than other affected countries. However, it may also lead to a frame of mind amongst investors to the tune of "if one can go, so can many", which may lead to further problems for remaining members. For example, if a

“Grexit” led to a loss of confidence in Italy, then it could potentially lead to the largest bailout program so far in the crisis. Italy has the 4th largest amount of sovereign debt in the world. The following section explores the risks/fears of insurers if Ireland was to exit from the euro.

2.3 Implications of the Evolving Crisis for Insurance Companies and Schemes

For both insurers and pension schemes, capital management has become a key issue, as the value of existing holdings of government debt has become very volatile. This, coupled with existing losses on equity exposures, has caused problems for many.

Investor confidence remains low – the majority of consumers now are risk averse. This poses difficulties for many insurance companies who would have sold a significant volume of investment business throughout the “boom” years.

A particular worry for unit-linked insurance companies since the Sovereign Debt crisis began relates to how it marketed its funds pre-crisis. For example, consider a consumer who invested in an Irish gilt fund on the basis of it being low risk. This consumer could have faced significant losses had they encashed their fund last July, when Irish bond yields were at their peak. Does such a consumer have grounds for complaint; in that they were incorrectly advised as to the riskiness of the product they were sold?

In the unlikely event of Ireland leaving the euro, the possible effects on an insurer could include:

- a “waiting period” may have to be introduced, during which time Companies do not settle claims, to allow time for the new currency to be issued throughout the country.
- a temporary relaxation of solvency cover requirements by regulators could be introduced to allow insurers time to “get their house in order”. There would be reliance on the regulator to make sure that any exceptions are allowed under strict conditions, such as detailed plans and timelines on how the company would revert to acceptable solvency levels.

One interesting aspect is that no insurance company went insolvent as a result of the restructuring of the debt in Argentina during its economic crisis between 1999 and 2002. However, if the same were to happen in Ireland, it could result in foreign (re)insurance companies leaving the market – with the reliance on this market in the IFSC would defaulting be a viable option?

From a claims point of view, the threat of civil disobedience would likely increase as a result of austerity measures in place throughout Europe. There have been outbreaks across Greece and Spain but these could spread across other countries as more and more have to increase austerity measures. This could have a knock-on effect to general insurance companies via more frequent claims experience for damage to vehicles / property. However, the likelihood of wide-scale civil disobedience in Ireland is quite low. Even lower is the prediction by some politicians (Vince Cable MP) that a Eurozone break-up could lead to war between countries.

As well as issues unique to the Eurozone crisis, the current economic environment also encompasses problems that a more “conventional” economic recession exhibits such as:

- Reduced premium volumes as individuals and businesses cut back on non-compulsory cover (e.g. from comprehensive to third party in motor) or as businesses close and no longer need cover,
- More fraudulent / speculative claims by policyholders,
- Increased lapses,
- Claims in classes directly linked to the economy such as payment protection insurance, trade credit insurance and directors and officers (D&O) insurance, which tend to have poor results in recessionary times, and
- Losses on equity portfolios for individuals, companies and schemes

Any of the above are likely to result in lower than expected profitability/returns on capital. While some of the risks above may be mitigated, mitigation often requires more time, effort and budget than may be readily available.

2.3.1 Valuation Interest Rates and Credit Risk

A key lesson from the Sovereign Debt crisis is that it is no longer possible to treat the yield on a sovereign bond as risk-free. When determining a suitable valuation interest rate to value liabilities, it is no longer sufficient to take the yield on the sovereign bond which provides a close cashflow match.

The Eurozone crisis has made insurers challenge previous assumptions on what constituted “risk-free” assets and expected annual returns. Could this eventually turn into a charge for holding “risk-free” assets as can be seen by the negative yields currently offered on German and French bonds?

As a result of yield movements, certain European government bonds have performed poorly over the past 12 months. For an insurance company, this can have implications on annual profit figures / targets. This may result in more focus on underwriting performance and how to maximise its efficiency. Or does it give an insurance company an opportunity to make use of more complex investment products, with the aim of achieving larger expected gains (but more risk) than competitors? This could also lead to an increased demand for more complex derivative products from insurance companies, as they try to find new ways to increase return or minimise risk. The higher volatility in the markets provides a potential opportunity and financial institutions could readily accommodate insurance companies requests.

There could be, and it looks like this is underway, a flight of capital to quality or “safe” currencies / investment vehicles and subsequently there may be a liquidity risk if capital flows are restricted in any way. Capital could get trapped in another country experiencing redenomination. This has clearly been seen in the spike in yields on Irish, Greek and other troubled European Government bonds over the past two years (see graph as at September

2012 below). This flight to quality has been experienced in both the insurance and reinsurance markets.

Using Argentina as an example, "corralitos" were created restricting any large scale flights of capital. It is also important to note the default of Argentina, a major exporter, occurred just before the start of a worldwide economic boom which helped to lift the economy out of the doldrums. If Ireland were to default, the precarious position of the world's economy would make any recovery even more difficult.

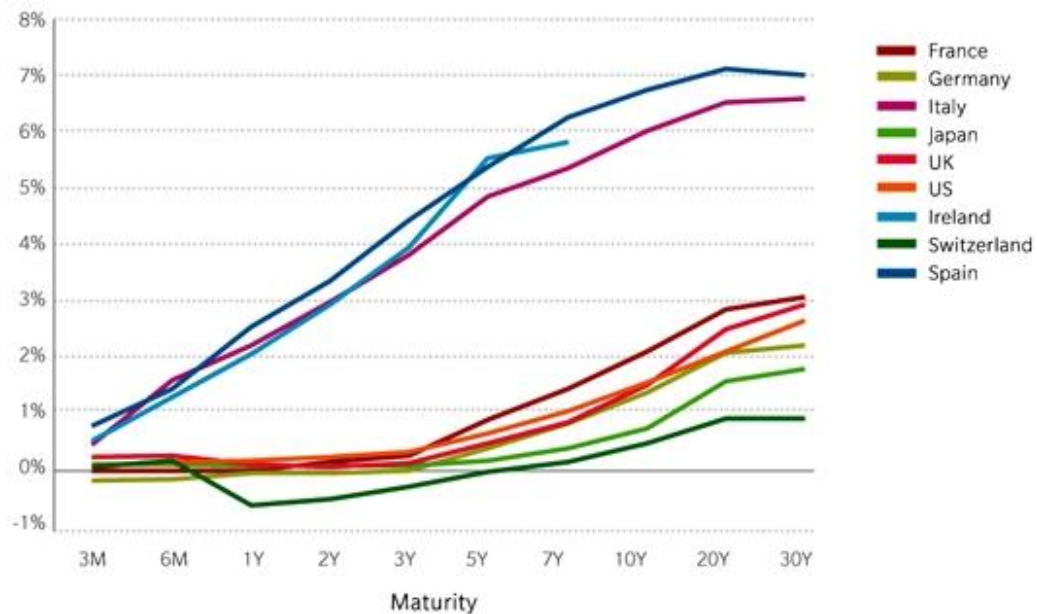
Current assumptions on the default risk of certain asset classes such as Government bonds may underestimate the likely default rate of these asset classes and as such could be overstating current and projected solvency levels. It is also important to note that companies can still be heavily exposed to government debt through investments in certain banks and other financial institutions.

It is worth stating that Irish Regulations always required an appropriate adjustment for credit/default risk, while actuarial guidance allowed credit to be taken for yield differences arising due to marketability factors. Now that we are more conscious of the existence of credit risk, the question arises as to how to appropriately quantify the components of a given yield that relate to risk and marketability.

The Society of Actuaries in Ireland's Working Party on Sovereign Exposures published a paper last year which highlighted some possible methods for dealing with this issue:

1. **Credit Default Swaps (CDS):** A CDS is a contract whereby the purchaser of the CDS will receive compensation from the issuer of the CDS in the event of a default event occurring. The residual spread on the bond, less the cost of the CDS, can be used to size the credit/marketability parts of the yield. However, these are affected by issues of supply/demand and the fact that the CDS issuer is pricing the CDS for profit.
2. **Market metrics:** Metrics such as are available on Reuters/Bloomberg could be used as an appropriate measure for the risk. The most common examples are the Z spread (zero-volatility spread) or ASW (asset swap spread).
3. **Solvency II:** The Solvency II matching premium could potentially be used to assess that part of the premium which could be included in the valuation interest rate.
4. **Historical experience:** Make use of historical data to assess the likelihood of a default occurring and adjust the yield accordingly. However, this approach would be hampered by the lack of reliable data when it comes to Sovereign defaults.
5. **Expert Opinion:** Consult experts on sovereign debt and use their views to assess the likelihood of a default or to size an appropriate yield adjustment. However, in the current market, there are a wide variety of opinions available and concrete conclusions are hard to obtain.
6. Other methods, such as using the covered bond method or structural method.

SOVEREIGN YIELD CURVES



SOURCE: GUY CARPENTER & COMPANY, LLC, BLOOMBERG

2.3.2 Matching Liabilities

While immunisation has long been argued redundant because of the practical issues involved, it still has uses in terms of constructing a suitable bond portfolio with reference to a particular pool of liabilities. However, the present crisis has taught us that there is no such thing as a risk-free asset. The notion of a risk-free sovereign investment is gone, and how we determine our asset profiles must reflect this.

While matching and immunization are useful tools to use to construct and define a suitable portfolio, the “buy and rebalance” capital management approach that they suggest is not suitable in the current climate. The new norm, going forward, will be one where a company’s asset profile and its capital base are both actively managed and actively monitored.

Hedging a portfolio against interest rate movements is difficult when it is hard to quantify what exactly the interest rate is. Becoming concerned about mismatching losses due to interest rate movements is also folly when the risk of investment default abounds.

There are approaches that can now be taken by companies, such as using swap contracts to reduce exposure to bonds and still maintain a sufficient duration hedge for interest rate movements. Such a methodology is one of many options, but has the advantage that, under Solvency II, liability values will be determined with reference to swap rates.

2.4 Outlook for Ireland and Europe – Predicting the Future

Ireland's bailout is progressing well, as we are meeting all our objectives and the economy is showing signs of stabilising. In addition, Ireland is an export-driven economy, so recoveries both within and outside the Eurozone will aid us. However, that does make Ireland particularly exposed to downturns elsewhere – the Eurozone crisis in itself is hampering global recovery and is in turn affecting Ireland.

To a certain extent, Ireland has two significant problems at present, in that it has high levels of debt and also a significant budget deficit.

1. A large part of Ireland's outstanding debt is actually bank debt that was guaranteed by the state. A change in the EU stance i.e. allowing direct EU investment to recapitalise Ireland's banks, would improve our position and hence our ability to return to the markets to finance ourselves. At the time of writing, no progress had been made on such a deal and it is unclear what shape such an arrangement would take. While it is possible that the ESM/ESM could be convinced to take on the Irish State's investment in banks which are viable, it is unlikely it could be convinced to take on the funding problems of banks which are being wound-down.
2. Ireland still retains a significant budget deficit. Over the next 3-5 years, steps will be taken to address this. However, while it remains, additional monies are going to be required to fill the funding shortfall. If additional monies cannot be obtained by borrowing on the open market, then Ireland will need to rely on external assistance from the ECB, or perhaps obtain an additional bailout. This is why it is so important to be able to convince the capital markets that the government is capable of controlling the state's finances.

Fears of a systemic spread across Europe have largely been realised, in that a widening group of countries have had to rely on EU intervention to raise finance. Greece fell first, but the problem has spread to Ireland, Portugal and Spain.

However, it is worth noting that only Greece has had to restructure its debt, so EU intervention has managed to contain certain aspects of the crisis.

In September 2012, Mario Draghi pledged that the ECB would do whatever it takes to protect the Euro from collapse. It appears, for now, that the Euro will continue with no casualties. For Ireland, the result of this may end up being that for the help we have received from the Troika in our debt crisis, we will permanently lose our economic sovereignty and Europe will get closer to a single banking union. If the tide does turn and Greece does leave the Euro, the risk of contagion spreads and the markets will be asking who is next? Ireland could then become the focus.

The current Eurozone crisis has seen lots of very public debate and opinions on the current status and with each passing day a new trigger seems to either galvanise the market to rally or send it into a despairing downward spiral. These short-term decisions can tend to hide the fundamental problem that Europe has to manage – keeping confidence in the Euro currency while at the same time trying to save countries with enormous deficits to overcome. This problem has been on-going for a number of years and still looks to be years from a complete conclusion. The prospect of low growth levels over the next number of years is a worrying sign for insurers.

Furthermore, the political aspect of this crisis should not be underestimated. As recently as the end of October, the two European heavyweights, France and Germany, were still in disagreement on the best path forward for Europe and their handling of the crisis

With Angela Merkel due for re-election next year, there may be still some manoeuvring on the solution. However, there does not appear to be any simple choices and every decision will still be painful.

For Ireland, being labelled a "special case" by our European peers in the middle of October may result in a large proportion of banking debt cleared. We watch and wait for developments on this. Insurance companies will be watching on with immense interest but it is crucial that insurance companies are developing contingency plans for all of the potential outcomes of this crisis.

When and where the crisis will end is unknown. Only time will tell!

2.4.1 Predicting the Future

During the summer of 2012, it looked ominous for Greece exiting the Euro, "Grexit" as it became known. Economic commentators were predicting when, not if, this will happen and how the exit would be managed. Over the quiet summer season, the signals coming from Mario Draghi, the European Central Bank President and musings from German Chancellor Angela Merkel have made this predicament less likely.

SUMMARY

- ❖ Issues surrounding sovereign debt and the Eurozone have continued to evolve over the last two years, causing considerable uncertainty for consumers and companies.
- ❖ The EU has taken actions, in terms of establishing agencies which are designed to assist countries in need of assistance and also strengthening EU budgetary rules.
- ❖ The impacts of such actions have, to date, failed to stem the crisis and the situation remains volatile.
- ❖ The impact on insurance companies includes increased uncertainty over asset values, claim trends, risk-free rates and mis-matching liabilities.

3 Pensions

3.1 New Regime for Defined Benefit Pensions

3.1.1 Introduction

Significant changes to the regulation of defined benefit pension schemes were enacted in the Social Welfare and Pensions Act, 2012. The detailed rules relating to the operation of the new regime were published by the Pensions Board in the form of prescribed guidance. In this section of the paper we consider the detail of these changes.

The legislation was enacted in May 2012 and the Pensions Board guidance was published in June 2012. This paper is being prepared shortly after this and will be presented before the first deadlines for the submission of Funding Proposals under the new regime. Therefore, it should be noted that opinions and practice on the details and consequences of the changes are still evolving at the time of writing.

Defined benefit schemes have been operating in a vacuum over the past number of years. The requirement to produce annual statements for annual reports and submit Actuarial Funding Certificates to the Pensions Board within prescribed timeframes remained. However, the requirement to submit a funding proposal to repair funding deficits under the Minimum Funding Standard disclosed in the annual statements or Actuarial Funding Certificates was suspended in 2009. This action effectively ‘switched off’ the Funding Standard as no action resulted from a failure to meet it. The Pensions Board has recently ‘switched back on’ the Funding Standard on the foot of new legislation as the guidance contains new deadlines for the submission of Funding Proposals.

The new legislation seeks to finally address the funding issues that have plagued defined benefit pension schemes over the past number of years. This revised approach has introduced a number of new components to the funding of defined benefit schemes:

- Sovereign annuities (originally legislated for in 2010),
- Credit for investment in EU sovereign bonds,
- Risk Reserves, and
- Employer Undertakings.

It is unclear whether the recent changes will finally put the funding of defined benefit schemes on an “even keel” or will ultimately accelerate the decline of defined benefit schemes. The intention of the Pensions Board is clear - to reduce the risk associated with funding defined benefit schemes but the alternative asset classes suggested, such as sovereign bonds, have their own inherent risks and only time will tell if this will be the

solution that trustees, members, sponsors, the pension industry and the regulator have been seeking.

3.1.2 Context

These are very significant changes to the defined benefit pension scheme environment and will likely have a strong influence over how such schemes look in the future. In this section we briefly highlight the increasing level of regulation in this area and the decline in the number of defined benefit schemes in recent years.

A Brief History of Pension Regulation in Ireland

For many years there was no pension specific governing legislation and schemes operated in the context of prevailing tax and trust law. The table below outlines the most significant legislation introduced relating to the regulation of occupational pension schemes since the Finance Act 1972, which related to the tax treatment of such schemes. As can be seen, even in the years following the landmark introduction of the Pensions Act 1990 there was only infrequent legislative change to the pensions' environment. However, it is evident that in recent times there have been almost annual amendments to pensions' law.

Act	Summary
Finance Act 1972	Concerned with the tax treatment of pensions
Pensions Act 1990	Wholesale regulation of pension schemes introducing preservation; Minimum Funding Standard; Disclosure requirements; establishment of Pensions Board etc.
Pensions (Amendment) Act, 1996	Amendments to the original Act, mainly of a technical nature and introduction of compulsory and voluntary reporting to the Pensions Board of suspected fraud and material misappropriation in pension schemes
Pensions (Amendment) Act 2002	Reduction of vesting from 5 to 2 years; PRSAs
Social Welfare and Pensions Act 2005	Trustees to be of good repute; assets invested in regulated markets and properly diversified; cross border schemes
Social Welfare Law Reform and Pension Act, 2006	Fixed rate substitution for index linked benefits under MFS; external review of actuarial work
Social Welfare and Pensions Act, 2008	Registered administrator; trustee training

Social Welfare and Pensions Act, 2009	Change in priority order on scheme wind up; "Section 50"; Introduction of Pension Insolvency payment Scheme (PIPS)
Social Welfare and Pensions Act, 2010	Sovereign Annuities
Social Welfare and Pensions Act, 2011	Amendment of "Section 50"
Social Welfare and Pensions Act, 2012	Minimum Funding Standard amended; Risk reserve introduced

The volume of change in recent years demonstrates that occupational pension schemes are now firmly on the radar of the Government. The pensions' environment has also been impacted by legislation outside the realm of the pensions' legislation above, such as budgetary changes introduced in the Finance Acts each year.

The Government's stated policy over the 2000's was to promote higher levels of pension provision and understanding amongst the population. The policy was implemented both by legislation and initiatives such as the National Pension Awareness Campaign run by the Pensions Board. The legislative changes included giving members access to greater levels of information regarding their scheme, improving standards of governance, reducing the vesting period for preserved benefits to 2 years and introducing Personal Retirement Saving Accounts (PRSAs).

However, recent changes such as the introduction of the pensions levy (whereby schemes are required to pay 0.6% of their assets to Revenue by 25th September each year from 2011 to 2014) in the Finance (No. 2) Act 2011 have increased the burden on schemes and will need to be funded by increased contributions by sponsors and/or members or reduced benefits for members.

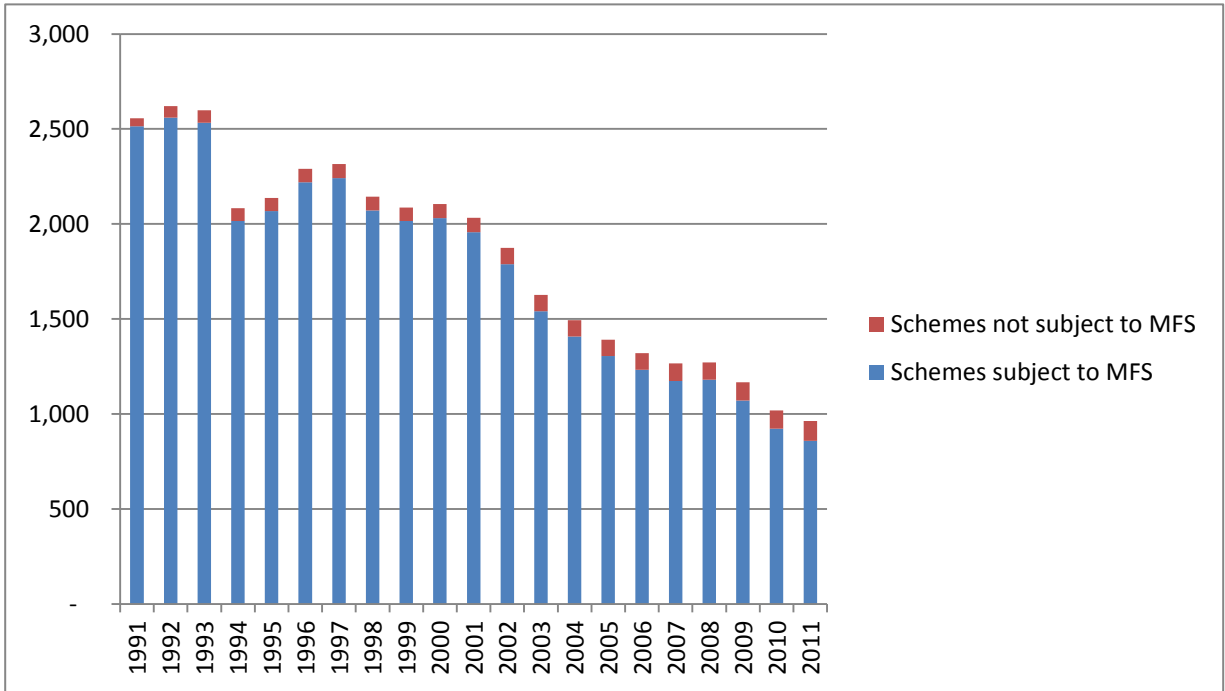
This section will consider only the significant changes the Minimum Funding Standard contained in the Social Welfare and Pensions Act 2012.

In addition to the pensions regulation outlined above there has also been an increasing number of changes to the tax regime under which pension schemes operate. We have outlined some of the major changes in recent times in the following table.

Act	Summary
Finance Act 1972	Concerned with the tax treatment of pensions
Finance Act 1999	<ul style="list-style-type: none"> • Flexible options on retirement from DC scheme • Introduction of ARF/AMRF
Finance Act 2006	<ul style="list-style-type: none"> • Introduction of Standard Fund Threshold (€5 million increasing with earnings index) • Introduction of tax-free lump sum limit at €1.25 million (increasing with earnings index) • Deemed distribution from ARF (1% in 2007, 2% in 2008, 3% in 2009) • Earnings limit for tax relief on contribution set at €254,000 increasing with earnings index
Finance Act 2011	<ul style="list-style-type: none"> • Earnings limit for tax relief on contributions reduced to €115,000 • Elimination of employee relief on contributions from PRSI and USC • Relief from employer PRSI on employee contributions cut to 50% • SFT reduced from €5,418,085 to €2,300,000 • Maximum tax-free lump sum reduced to €200,000 • Deemed distribution from ARF increased to 5% • ARF available to DC scheme members
Finance (No. 2) Act 2011	<ul style="list-style-type: none"> • Pension Scheme Levy
Finance Act 2012	<ul style="list-style-type: none"> • Elimination of relief from employer PRSI on employee contributions • Deemed distribution of 6% for ARF and vested PRSA over €2m

Context - Decline of Defined Benefit Schemes

The graph below outlines the decline in the number of defined benefit schemes operating in Ireland. The decline is stark, especially once we remove schemes that are not subject to the Minimum Funding Standard – generally public sector schemes – which have actually increased over the period.



The number of defined benefit schemes, excluding those that are not subject to the Minimum Funding Standard, has more than halved since 1991. It is unclear whether this trend will be abated by the new funding standard or if the trend will continue or even accelerate. It has been mooted that many schemes may wind up following the recent legislative changes.

3.1.3 New Funding Rules for Defined Benefit Schemes

3.1.3.1 Funding Proposals

Following the suspension of the requirement to submit a funding proposal to rectify deficits under the MFS in 2009 the Pensions Board announced the following the submission deadlines in June 2012:

Scheme Year-End	Deadline (with Section 50)	Deadline (no Section 50)
1st June to 31st December	31st December 2012	28th February 2013
1st January to 28th February	Scheme year end in 2013	28th February 2013
1st March to 31st May	Scheme year end in 2013	Scheme year end in 2013

However, following representations made to the Pensions Board they announced in September 2012 a new deadline of 30th June 2013 for all outstanding Funding Proposals (whether or not they are accompanied by a Section 50 application). Section 50 of the Pensions Act 1990 allows the Pensions Board to retrospectively reduce the benefits payable to members following an application from the Trustees. An example of such a reduction would be to remove guaranteed post-retirement increases.

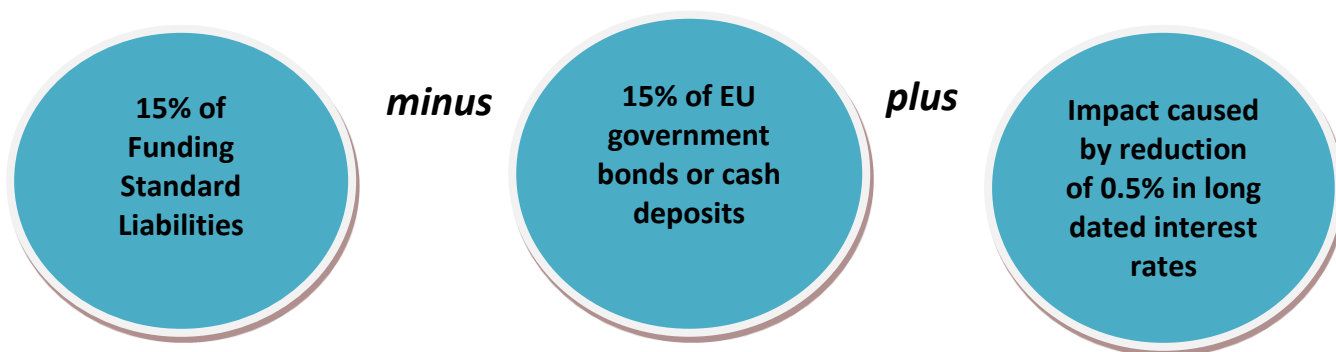
The extension of the deadline will reduce the immediate time pressure on trustees and sponsors who will need time to discuss and agree a funding proposal for submission to the Pensions Board. However, the new Funding Standard is more complicated than the previous version with the introduction of risk reserves; employer undertakings; sovereign annuities and new consequences of holding Irish bonds. Therefore, trustees and sponsors should engage earlier rather than later to meet the deadlines. This is especially the case where funding proposals include benefit reductions.

The funding proposal period has been extended to allow schemes up to 31st December 2023 (subject to Pensions Board approval) to rectify any deficit. Funding proposals that extend beyond 1st January 2016 will have to meet the risk reserve requirement by the end of the funding proposal period.

3.1.3.2 Risk Reserve

From 1st January 2016 onwards schemes will be obliged to maintain a risk reserve. The rationale behind holding a risk reserve is to implement a buffer against the volatility of holding riskier investments, such as equities and property. The Pensions Board have been commenting for a number of years that schemes were investing too heavily in volatile investments and, trustees should be mindful of the risks associated with such investments. This is also in line with European regulation.

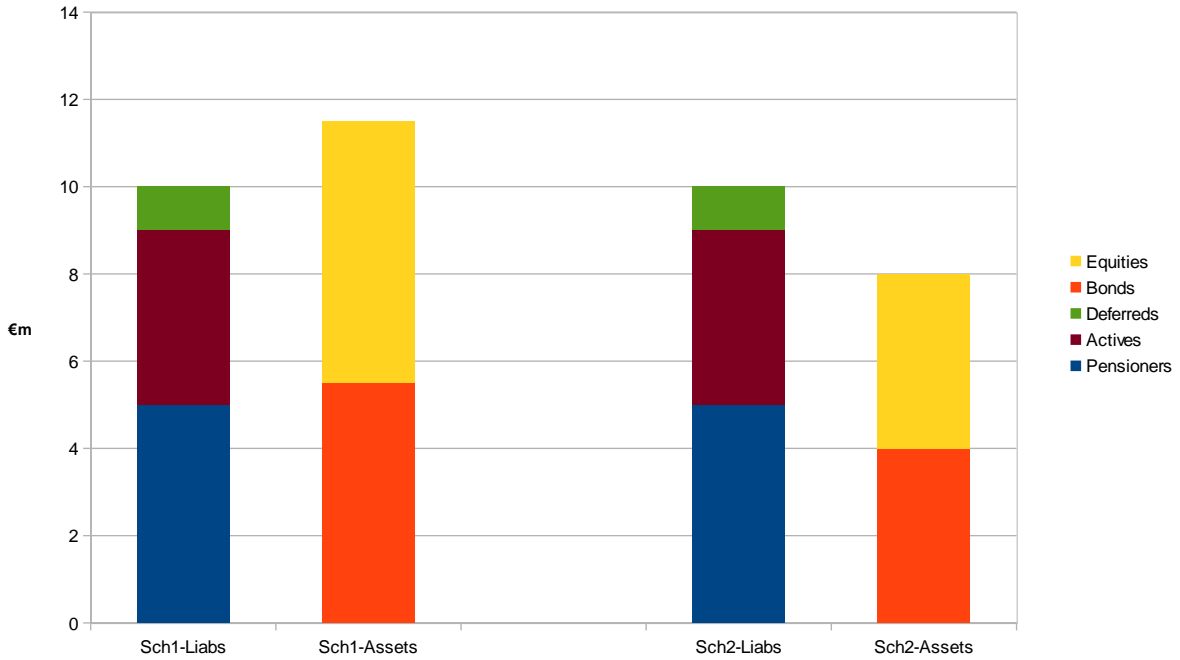
The risk reserve is calculated as the sum of:



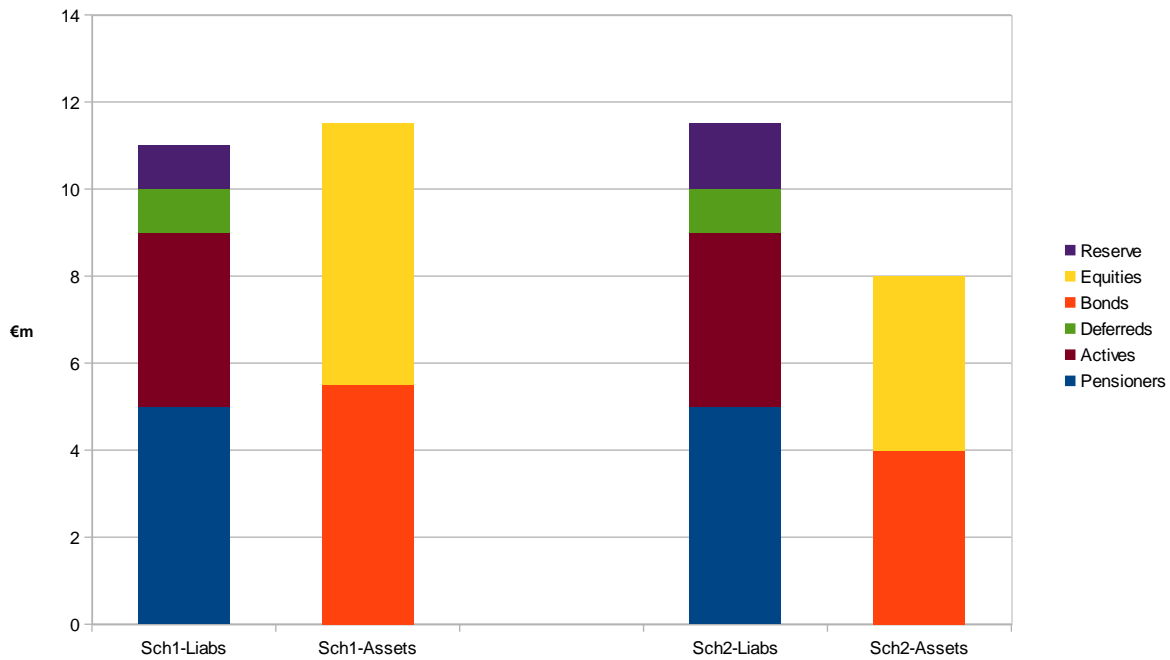
The assumed change in the long dated interest rate will impact on both the assets and the liabilities.

The Minister for Social Protection has the power to vary the percentages above.

The graphs below set out an example of how this may impact two generic schemes.



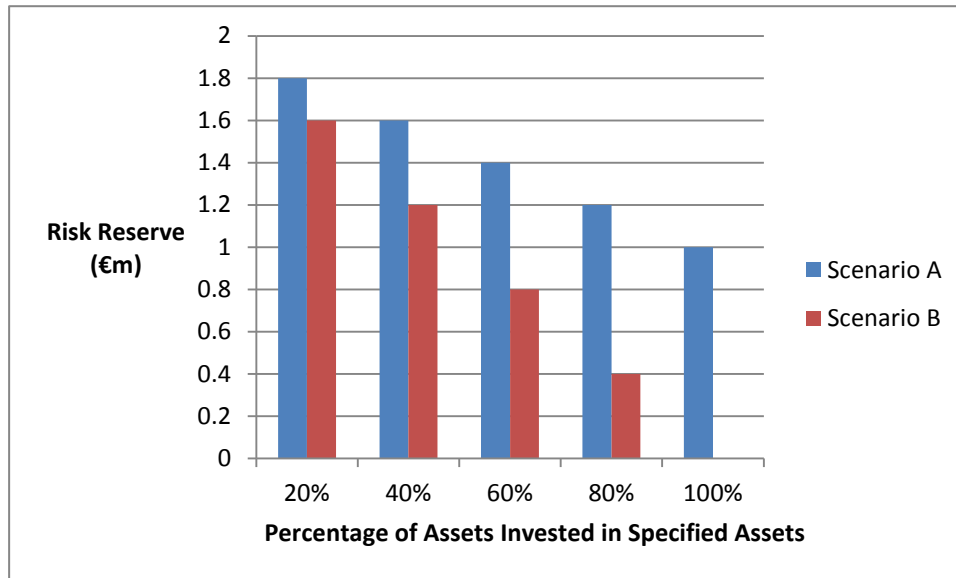
Scheme 1 has just under €6m in bonds and approximately €12m in total assets. Scheme 2 has €4m in bonds and only €8m in total assets. Both schemes have the same liability profile. Scheme 1 has a surplus under MFS of approximately €2m and Scheme 2 a €2m deficit. The risk reserve that would be required for the schemes is shown below:



The risk reserve required for Scheme 1 is €1m with Scheme 2 requiring a larger risk reserve of approximately €2m. The risk reserve for Scheme 2 is larger as it is currently in deficit and holds less of its total assets in bonds than Scheme 1.

The risk reserve “stresses” the liabilities in the first part of the risk reserve calculation and results in schemes in deficit requiring larger risk reserves. The following example shows two schemes with the same liabilities but different funding levels. As can be seen the size of the deficit can impact significantly on the risk reserve requirement.

Scenario	A	B
Liabilities	€10m	€10m
Assets	€5m	€10m



Risk reserve requirement for different levels of specified assets held

It is interesting to note that the yields in many Eurozone countries are currently at record levels with Ireland, Spain, Greece, Portugal and Cyprus in receipt of funding from the EU/IMF. However, under the risk reserve requirement these bonds are given credit as being less volatile or risky than corporate or non-EU sovereign bonds, such as, Canadian or Chinese sovereign debt. The table below illustrates the credit granted under the risk reserve at time of writing. The Minister has the authority to change which assets are classified as “specified assets” and representations in this regards have been made by the Society amongst others.

Asset class	Specified Asset?	Does reduction interest impact?	0.5% in rates	Comment
Eurozone Sovereign bonds	✓	✓		Allowable
EU Sovereign Bonds	✓	✓		Allowable
Non EU Sovereign Bonds	✗	✓		Not a specified asset
Non Sovereign bonds	✗	✓		Not a specified asset
Cash	✓	✗		Interest rate change has no impact
Equity	✗	✗		No credit
Property	✗	✗		No credit

3.1.3.3 Sovereign Annuities

Sovereign annuity legislation was introduced in the Social Welfare and Pensions Act 2010. Legislation facilitating the introduction of sovereign annuities was passed by the Oireachtas in 2011 (The Social Welfare and Pensions Act 2011). This allowed pension schemes to purchase sovereign annuities. Sovereign annuities are dealt with in detail under Section 5.5. This section focuses on the impact of sovereign annuities on Defined Benefit pension schemes.

A significant issue for insurance companies looking to develop a sovereign annuity product was the lack of appropriate Irish government bonds. At the time the longest such bond available matured in 2025 and this would have led to significant reinvestment risk and reduced the yields available on products based on this issuance.

To deal with this issue, the National Treasury Management Agency (NTMA) issued five “amortising bonds” on 23rd August 2012. These bonds had maturities of 15 - 35 years and yields of 5.72% to 5.92%. Amortising bonds pay regular even payments and do not have a repayment of principal at maturity. At time of writing no sovereign annuities have been sold but, based on the yields of the amortising bonds, indications are that discounts of over 20% on conventional annuities will be available.

In a wider context, this sale, along with the government bond sale on 26th July 2012 (which was the first long term issuance since shortly before the bailout by the ‘troika’ in late 2010) were seen as another step towards full access to the bond markets for the Irish government.

The impact of holding sovereign annuities can be best illustrated considering a scheme in wind-up. The table below shows the percentage of the benefits that non-pensioners would receive in the situation where a) conventional and b) sovereign annuities are purchased for pensioners. For simplicity, the example assumes that the scheme does not have guaranteed post-retirement pension increases and a 20% discount for sovereign annuities over conventional annuities.

	Conventional Annuities	Sovereign Annuities
Liabilities - Pensioners	€10m	€7m
Liabilities - Non-Pensioners	€7m	€7m
Assets	€12m	€12m
Deficit	€5m	€2m
Coverage for non-pensioners	29%	71%

As can be seen, the purchase of sovereign annuities results in non-pensioners receiving significantly higher payments in a wind-up situation. However, it must be remembered that,

as in wind-up the annuities would be purchased on the “buy out” basis, the pensioners carry the risk that the bond underlying the sovereign annuity defaults or restructures.

Given the many risks involved (including default risk, concentration risk, liquidity risk and reputational risk) Trustees will need to proceed with great caution before purchasing sovereign annuities. It remains to be seen what role they will play in the future of defined benefit pension schemes.

3.1.3.4 Holding EU Sovereign Bonds

Rather than purchase sovereign annuities trustees may choose to hold EU sovereign bonds directly. This will enable them to receive a credit under the risk reserve, as long as the trustees resolve to buy sovereign annuities in the event the scheme is wound-up. A credit will be allowed in the calculation of the scheme’s MFS pensioner liabilities.

The level of reduction in liabilities will depend on whether there are sovereign annuities available in the market that are linked to the sovereign bonds held by the scheme:

- If such annuities are available, the credit will be equal to the sovereign annuity discount on conventional annuities. For example, if there is a 20% discount available on Irish bond backed sovereign annuities, the scheme’s MFS liabilities for pensioners can be reduced by 20% by holding the Irish bonds.
- If no such sovereign annuity is available, the credit will be a discount of 20%, provided there is at least a 3% yield-gap between the relevant bond and an appropriate German bond. If the yield-gap is less than 3%, no credit can be taken.

Certain conditions must be met before credit can be taken in an MFS test for any reduction.

The trustees must:

- Take advice in relation to the appropriateness of securing pensions in this way;
- Subject to this advice, formally confirm that it is their intention to secure pensions by purchasing sovereign annuities in the event of a wind up;
- Having decided on this intention, the trustees must communicate it to scheme members and any authorised trade union and advise them of the default risk to pensions in payment.

There are further rules as to the allowances that can be made for Sovereign Bonds in Funding Proposal calculations:

- A pricing reduction can only be allowed for if (at the date of certifying the Funding Proposal) the scheme holds EU sovereign bonds of a value not less than the pensioner liabilities under the scheme.
- Any pricing reduction above 5% must reduce uniformly to 5% at 31st December 2023.

These restrictions will likely impact on the level of Sovereign Bonds purchased and, as with Sovereign Annuities, their impact remains to be seen.

3.1.3.5 Contingent Assets and Employer Undertakings

Apart from a scheme's directly held assets and future contributions, trustees can meet some or all of their funding requirements through a combination of contingent assets or employer undertakings.

A contingent asset is an asset which the Trustees can claim on the occurrence of one or more future events, e.g. on wind up of the scheme. Examples include bank guarantees, letters of credit, default insurance etc.

Contingent assets must conform to a stringent set of requirements relating to the contingencies in which the asset becomes available, the period over which it is available and the valuation of the asset. An employer undertaking for which the appropriate security has been provided may be regarded as a contingent asset provided it meets the Board's guidelines for contingent assets.

An employer undertaking is a promise made by an employer which involves a legally enforceable obligation on the employer to act in accordance with that promise. An unsecured employer undertaking may also be considered as a means of meeting the risk reserve requirement, but not the basic MFS liabilities, but only where the employer has an investment grade credit rating ("A" rating from Standard & Poor's). This would apply to very few sponsors.

SUMMARY

- ❖ There have been many changes to the regulatory environment in which pension schemes operate in recent years.
- ❖ The changes introduced in the Social Welfare and Pensions Act 2012 will have a significant impact on the future of defined benefit pension schemes.
- ❖ The full impact this will have remains to be seen.

3.2 Analysis of Fiscal Incentives for Retirement Savings

3.2.1 Introduction

The Society of Actuaries in Ireland commissioned a study to analysis the fiscal incentives for retirement savings funded by the Irish Fiscal Policy Research Centre (publicpolicy.ie). This report was prepared by Deloitte and released in October 2012.

The report considered both the state pension and private pension and compared the fiscal incentives to save for retirement in Ireland with that in other countries.

3.2.2 Initial Findings

The study required making several long term assumptions but found that overall the Irish system is progressive with the state pension benefit being both progressive and redistributive. When Ireland is compared to a number of other countries such as the UK, Australia, Sweden, Canada, the Netherlands and Singapore, the Irish system was found to be more progressive.

3.2.3 Fiscal Incentive Index

For the purposes of the study a fiscal incentive index was developed and it is a comparative ratio rather than an absolute index.

Fiscal Incentive Index (FII) =

$$\frac{\text{Present value of tax relief received on employer and employee contributions}}{\text{Present value of tax paid on retirement benefits}}$$

A FII greater than 1 indicates an incentive to save for retirement. That is the present value of tax relief of the tax relief obtained from the state exceeds the present value of the tax paid on the arrangement.

3.2.4 FII Ratio for Both State Pension and Private Pensions

In the table below, Pillar I refers to the state pension and Pillar II refers to private pension. The assumptions underlying the calculation of the FII in the table below are set out in the Analysis of Fiscal Incentives for Retirement Savings report.

Salary	Year 1 Pillar II contributions	Year 1 Adjusted PRSI contributions	Fiscal Incentive Index ("FII")		
			Commencement Age	Commencement Age	Commencement Age
			30	40	50
30,000	4,500	3,225	1.0	1.6	2.9
50,000	7,500	5,375	0.7	1.0	1.7
75,000	11,250	8,063	0.5	0.7	1.2
150,000	22,500	16,125	0.3	0.4	0.7

As can be seen from the table above, the FII measure increases with age but decreases as salaries increase. This illustrates the greater incentive to save closer to retirement and the progressive nature of the Irish pension system.

The FII measures are low partly due to the interaction of uncapped PRSI contributions with the flat state pension benefits in retirement. In other words those on higher salaries pay more in terms of PRSI contribution but receive the same level of benefit.

3.2.5 Private Pensions

The table below strips out the impact of the state pension and focuses on private pensions.

Salary	Year 1 Pillar II contributions	Fiscal Incentive Index ("FII")		
		Commencement Age	Commencement Age	Commencement Age
		30	40	50
30,000	4,500	2.8	4.9	16.2
50,000	7,500	1.9	3.2	7.0
75,000	11,250	1.2	2.4	4.4
150,000	22,500	0.5	1.0	2.4

The table indicates that there is a strong incentive to save for retirement for the majority of tax payers other than the higher earners at younger ages. The principal reason for measures of FII greater than 1 are the combination of employees moving to a lower tax band during retirement and the availability of a tax free lump sum.

It should be noted that the level of employer contribution plays a key role. Employer contributions receive tax relief at the level of corporation tax, currently 12.5%, rather than the employees' marginal rate. The FII would be higher if the employer did not contribute.

3.2.6 Reduced Income Tax Relief

If tax relief on contributions is reduced to the basic rate of tax relief or composite rate of 33% a significant reduction in the FII is seen. The table below sets out the FII if the rate was lowered from the current marginal rate to 20% or 33%.

Salary	Current Regime Age 30	Basic rate tax relief or composite rate of 33%	20% tax relief on all individual contributions
30,000	2.8	2.5	2.1
50,000	1.9	1.7	1.3
75,000	1.2	1.0	0.8
150,000	0.5	0.5	0.4

3.2.7 Analyses on Various Changes to the Current Pension Regime

The report compared the impact of:

- Reducing tax relief from the marginal rate to the standard rate or a composite rate of 33%, or
- Reducing the benefits that would qualify for tax relief (known as the Standard Fund Threshold) to the equivalent of a €60,000 annual pension (or a capital amount of €1.5m in this example).

The report concludes that while reducing tax relief would have a marked impact on the incentive to make retirement savings at most salary levels, the impact of reducing the pension benefits qualifying for tax relief to an annual pension of €60,000 would only affect the higher paid.

Indeed, in Budget 2013 Minister Michael Noonan announced that the Standard Fund Threshold would be reduced to a level based on an annual income in retirement of €60,000. This is to be implemented from 1st January 2014 and there is to be consultation on the details before that date. He also announced that contributions will continue to attract relief at the marginal rate.

3.2.8 Comparison with Selected Other Countries

The private pension provision in each of the countries selected operates differently to that in Ireland. With the exception of Australia all selected countries operate on an Exempt; Exempt; Tax basis. The table below highlights the fundamental differences.

Country	Australia	Canada	Netherlands	Singapore	Sweden	United Kingdom	Ireland
Core Pillar II Participation	Mandatory / Voluntary	Voluntary	Mandatory	Mandatory / Voluntary	Mandatory	Voluntary, but auto-enrolment	Voluntary
Lump sum on retirement	Yes (Up to 100%)	No	No	Yes (50% of fund)	No	Yes (25% of fund)	Yes (25% of fund, or service / salary formula)
Corporation tax	28.0%	26.5%	25.0%	17.0%	26.3%	23.0%	12.5%

The FII ratios calculated below are not directly comparable and a number of simplifying assumptions were made in order to enable some level of comparison. That said, from the FII ratios calculated it does not lead to the conclusion that the Irish system is unduly generous – it is also more progressive than most.

Salary € (Age 30)	Australia	Canada	Netherlands	Singapore	Sweden	UK	Ireland
30,000	2.6	1.6	1.9	1.6	0.9	1.5	2.8
50,000	2.7	1.8	1.8	1.8	1.1	1.9	1.9
75,000	2.8	1.9	1.4	1.9	1.2	1.9	1.2
150,000	2.7	1.3	0.9	1.3	0.9	2.0	0.8

3.2.9 Summary of Analysis of Fiscal Incentives for Retirement Savings

From the information contained in the report it is clear that the current Irish pension system is progressive and not overly generous by international standards. The mooted lowering of the relief available will reduce the attractiveness for individuals to save for retirement and, if introduced, could lead to increased burden on the state if the level of private retirement savings falls.

The following quotation is from “The Mirrlees Review; Conclusions and Recommendations for Reform, Institute for Fiscal Studies 2001”

“While achieving neutrality between different forms of saving and investment is our general aim, there may be a good case for treating pension saving more generously. Behavioural evidence suggests that people tend not to make decisions in far sighted and rational ways. Individuals with inadequate retirement savings are also more likely to draw on costly state benefit programmes in retirement. Encouraging them to save in a pension when they are young makes this less likely.”

SUMMARY

- ❖ The report shows that the Irish pension system is progressive and not overly generous by international standards.
- ❖ Changes to tax relief would reduce the attractiveness for individuals to save for retirement and could lead to increased burden on the State if the level of private retirement savings falls.
- ❖ This view is mirrored in the announcement in Budget 2013 of a Standard Fund Threshold based on an annual pension of €60,000 while contributions are to continue to attract relief at the marginal rate.

3.3 Review of Section 48 of the Pensions Act, 1990

3.3.1 Background

The Government indicated in 2011 that it intended to change Section 48 of the Pensions Act, which relates to the priority order in which assets are dispersed on wind-up of a scheme. However, this change did not appear in the Social Welfare and Pensions Act 2012 with the other changes which had been flagged. The Department of Finance has continued to work on the issue and the Society has also considered possible alternatives to the current legislation.

3.3.2 Society of Actuaries in Ireland - Proposal

A number of insolvent schemes are winding-up and are likely to wind-up in the future. As a result of the priority afforded to pensioner benefits on wind-up, a disproportionate burden will be borne by active and deferred members.

The Society proposes that priority should be given to the provision of a minimum level of pension to pensioners and that Trustees should be empowered to avail of a capitalisation settlement option as opposed to annuity purchase only. The finer details of this proposal are currently being considered.

3.3.3 Advantages

The advantages of this structure include:

- A minimum level of pension is guaranteed by a conventional annuity,
- It gives additional flexibility which may be appreciated by pensioners,
- In all but the most mature or underfunded schemes the active and deferred members will receive a higher proportion of their benefits.

3.3.4 Risks and disadvantages

There are several risks to this approach which need to be carefully considered:

- Changes which reduce the protection for current pensioners will be politically difficult to implement,
- In very mature or severely underfunded schemes the active and deferred members may still end up with nothing following a wind-up,
- Pensioners with pensions under small pensions due to short service may have their pensions protected at the expense of those with longer service.

It remains to be seen what approach the Department will take in revising Section 48.

3.4 Professional Affairs

3.4.1 Conflicts of Interest – Pensions Actuaries (ASP PEN-13)

ASP PEN-13 was introduced by the Society of Actuaries in Ireland with effect from 1st April 2010 to give guidance to pensions actuaries on how to deal with conflicts of interests that may arise during the course of their work. The original version applied to Scheme Actuaries only but the most recent version (version 1.3) which came into effect from 1st November 2012 widened the scope to include all actuaries (including part-qualified actuaries). This version also explicitly stated that the advice in scope is that “in relation to the financing of the liabilities of the scheme... to include, but not limited to, associated advice on investment objectives and asset strategies and the management of investment/financial risk within the scheme”. It applies where:

- An actuary holds a Dual Appointment (i.e. where Trustee actuary is also providing advice to the Sponsoring Employer), and
- Actuaries from the same firm are advising the trustees and the Sponsoring Employer.

There have always been conflicts of interest in actuarial work on pension schemes but the recent funding difficulties and increased legislation created an environment where it was more difficult to manage these conflicts. It was in this context that ASP PEN-13 was introduced.

Given the rapidly changing environment it was decided to use a principles-based approach for this guidance although it does specify some actions an actuary must take should conflicts arise.

3.4.1.1 Dual Appointment

The actuary must put in place a Protocol for managing conflicts of interests and these Protocols are subject to regular review. ASP PEN-13 outlines the details of what these Protocols should contain.

Conflicts of interest arise under a Dual Appointment situation where:

- Circumstances change so that the actuary cannot work under the Dual Appointment without breaching the terms of the Protocol,
- The actuary has received confidential information from one party which will constrain them from acting in a professional manner in the other party’s interest.

If such a conflict arises the actuary must either:

- Inform the trustees or Sponsoring Employer that he or she cannot comply with the request that gave rise to or made evident the Conflict of Interest,

- Inform the trustees or Sponsoring Employer that he or she can no longer act in accordance with the protocol and either:
 - Modify the protocol or the Dual Appointment, or
 - Suspend or cease one or both of the Appointments.

The guidance also emphasizes integrity and effective communication.

3.4.1.2 Same Firm Appointments

Where there is a same firm appointment the two actuaries must:

- Have regard for the principles of the guidance,
- Put in place a Protocol for managing conflicts,
- Not share or access information unless otherwise specified in the Protocol, and
- Be satisfied of their ability to act independently.

3.4.2 Updates to ASP PEN-3 and ASP PEN-4

ASP PEN-3 sets out the requirements in relation to the preparation of Actuarial Funding Certificates and actuarial statements.

ASP PEN-4 sets out the requirements relating to the preparation of funding proposals.

The significant changes to the Funding Standard regime introduced in the Social Welfare and Pensions Act 2012 and the related Pensions Board guidance, discussed in the first section of this paper, gave rise to a requirement to update ASP PEN-3 and ASP PEN-4. The revised ASPs will be submitted for approval with a request that they be implemented from 1st January 2013.

3.4.2.1 ASP PEN-3

The key proposed changes to ASP PEN-3 are as follows:

- Previous versions included text from the legislation. This has now been removed and in future actuaries will be required to refer to the legislation directly.
- A new section was added to deal with the new requirement to submit a Funding Standard Reserve Certificate (FSRC) at the same time as an Actuarial Funding Certificate (AFC). An FRSC will be required for all AFCs submitted with an effective date on or after 1st June 2012.
- Guidance relating to the preparation of actuarial statements when a funding proposal is in place was moved to ASP PEN-4.
- Guidance in relation to notifying the Pensions Board of a change in Scheme Actuary has been deleted.

3.4.2.2 ASP PEN-4

The key proposed changes to ASP PEN-4 are as follows:

- Previous versions included text from the legislation. This has now been removed and in future actuaries will be required to refer to the legislation directly.
- A section relating to actuarial statements when a Funding Proposal is in place has been introduced (the majority of which came from ASP PEN-3).
- Guidance relating to the investment test has been deleted as this is no longer required.

Proposed changes to the actuarial assumptions prescribed in Appendix 1 of the ASP are still under consideration, following inputs from some members during the recent consultation process.

4 Investment

4.1 Market Update

Equities have now performed poorly over most longer-term periods back to 2000 and the outlook remains difficult.



Source: Bloomberg

This has created many challenges for investors. Economic activity remains weak and levels of market uncertainty are extremely high. Despite these challenges, investors are looking for opportunities to enhance returns and reduce risk through investment in other asset classes (discussed in Section 4.3.2).

The Eurozone crisis has dominated market headlines over recent years. The crisis began in 2009, as Greek debt reached 113% of GDP – nearly double the 60% limit stipulated by the Eurozone regulations and shortly afterwards irregularities were discovered in the Greek government accounts. These events led to investors becoming concerned about other heavily indebted Eurozone countries, specifically Portugal, Ireland and Spain.

Greece and Ireland were the first countries to receive bailouts from the EU and IMF. As a result, Europe's finance ministers approved the creation of the European Financial Stability Facility (EFSF), a €750bn fund set up with the aim to preserve financial stability in Europe. Shortly after this fund was set up, Portugal joined the ranks of Ireland and Greece and received a bailout.

These unstable economic conditions across the Eurozone have caused much of the volatility seen in the Euro bond markets with pronounced differences between the yields on different Euro Government bonds emerging as the sustainability of government deficits and the fragility of the banking systems in some “peripheral” countries was questioned.

Even core Eurozone countries (e.g. Germany and France) have not gone unscathed by the crisis, as fears over contagion and a possible break-up of the euro have damaged all Eurozone economies. As issuers of debt, however, these countries have fared quite well. Germany is one of the few Eurozone countries that still maintains its AAA status. As a result, its yields have reached unprecedented lows in the last few years as investors flock towards these perceived safe havens.

4.1.1 2012 Market Update

Although pressures and uncertainty remain, the first ten months of 2012 saw a recovery in growth markets. Growth assets such as equities were the primary beneficiary of the improved economic position as corporate profitability improved and investor risk appetite returned. While stock markets remained volatile, the MSCI World Index gained 9.4%, in Euro terms, over the ten months. The volatility in these markets is captured by the VIX Index and the graph below shows its progression over 2012:



Source: Bloomberg

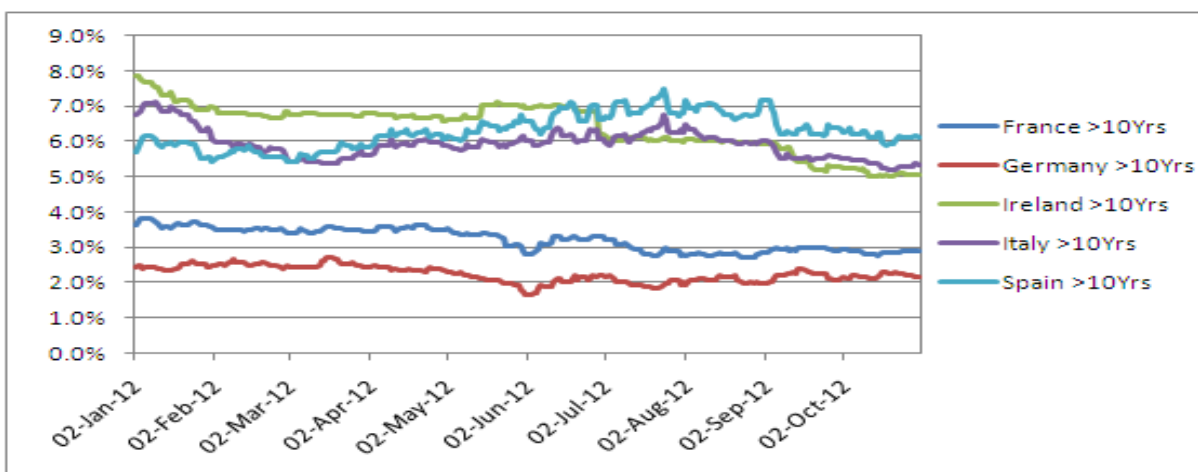
As you will note from the graph above, May was the most volatile month of the year so far (it also was the poorest performing month with the MSCI World Index returning -2.1% over the month). This volatility was driven by political concerns over elections in France and Greece, the risk of contagion over a possible Greek exit from Eurozone, and the deterioration of the Spanish banking sector.

In September, investor reaction was positive following a number of key policy announcements by global central banks. In Europe, the ECB (as promised) announced details of its bond buying programme in an effort to reduce bond yields in peripheral markets and help address the European sovereign debt crisis. In the US, following some uncertainty among investors as to whether additional monetary stimulus would be forthcoming, the Fed announced it was launching a third Quantitative Easing (QE3) programme to stimulate economic growth and lower the rate of unemployment. In anticipation of one most tightly fought elections in US history, concern grew among investors in October due the post-election political deadlock that could hinder the resolution of the fiscal cliff facing the nation in early 2013.

The Euro fell slightly against the main trading currencies of the Dollar and Sterling over the first ten months of the year, however, to some extent, these currencies are also under pressure due to slowing growth and their own domestic debt concerns.

Eurozone government bond markets were mixed over the year with the Merrill Lynch Over 10 Year EMU Government bond index returning 12.9% over the first 10 months of the year. This masked the considerable volatility within the markets over the course of the year.

The graph below shows the progression of bond yields over 2012 (lower bond yield implies higher price):



Source: Data sourced from Barclays Bank PLC

The Eurozone debt crisis has changed the way investors look at bond markets and consequently the role of bonds in investors' portfolios. We discuss this later in the paper.

Unfortunately for pension schemes, insurance companies and all other investors, the Eurozone situation is quite fluid and there is no certainty as to how it will play out and what assets will perform best throughout the crisis. It is a challenging time for investors where government policy decisions have a larger than usual influence on their portfolios.

Other Asset Classes

The Irish Commercial property market continues to struggle over 2012. Many investors who have invested in property pooled funds cannot access their money immediately as liquidity restrictions have been put in place due to lack of demand from property buyers.

Emerging market equities are in positive territory over 2012, however, they have underperformed developed equity markets. This level of volatility should be expected from emerging market stocks and the concerns over the extent of a slowdown in some key emerging market economies (in particular, China), have weighed heavily on these markets. It should be noted that a continued weakening of the Eurozone and global developed markets affects emerging markets due to a “risk off” atmosphere when investors seek “safe” assets.

In this highly uncertain economic environment, investor risk appetite has ebbed and flowed with economic data. A strong inverse correlation remains between global developed market equities and government bonds while correlations between all growth assets remain high. Financial markets look set to remain event-driven and data sensitive over the coming months.

SUMMARY

- ❖ Market returns remain negative over most long term periods as a result of the on-going financial crisis. There has been a surge in equity markets since 2009 but volatility has been high over the same period.
- ❖ 2012 year to date has been positive for all the main asset classes with the MSCI World up 9.4% over the first 10 months of 2012 and the Merrill Lynch Over 10 Year EMU Government bond index returning 12.9%.
- ❖ While there has been a strong policy response by global central banks so far in 2012, the environment remains very uncertain for all investors.

4.2 “Hot” Asset Classes of 2012

4.2.1 Fundamental Indexation

The majority of passively managed funds reflect the market capitalisation approach. However, market capitalisation weighted indices tend to be bias to past success and are prone to risk of concentration and asset price bubbles. For example, Japan reached half of the world index in 1989.

One approach to mitigating concentrations of risk at a stock level would be to adopt an equally-weighted portfolio to all stocks in a given index. However, this approach is likely to lead to unwanted concentrations at a sector level (e.g. in sectors with many companies), would not be investable at a large scale, would bring a significant small cap biased and result in increased transaction costs.

Fundamental indexation is a more robust approach, addressing some of the issues with market capitalisation. It creates a portfolio that reflects companies “economic” weights rather than their capitalisation weights. “Economic” size of a company can be measured using a number of fundamental metrics such as sales, cash flow, book value and dividends.

The theory is that Fundamental indexation should outperform market cap weighted indices over time due to avoiding concentrations caused by behavioural biases of investors.

4.2.2 Small Cap Equities

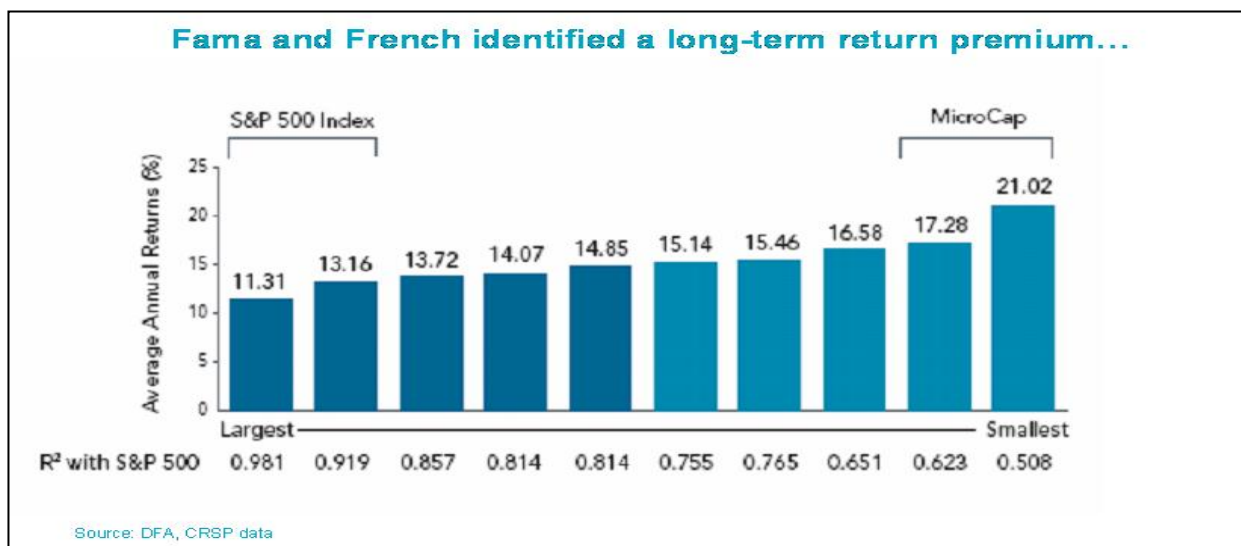
Small cap stocks are typically defined as companies with a market capitalisation of less than \$5bn.

The inclusion of a small cap element in the overall growth portfolio should, in theory, increase the total expected return from equities although at the expense of additional risk. The main reasons for this are as follows:

- Higher earnings growth than developed stocks- smaller companies are capable of growing more quickly than large companies. For example, it should be easier for a €100m turnover company to grow revenues by 50% than a €100bn company. Therefore, excluding external factors, smaller companies would be expected over time to outperform larger companies,
- Greater alignment with investors - smaller companies are more flexible than larger companies and management can be more directly incentivised to add value for shareholders (often being significant shareholders themselves), which may lead to better performance,

- Smaller companies usually trade on lower valuations than larger companies, at least until their “story” becomes widely appreciated,
- High alpha potential (where alpha is the return in excess of the compensation for the risk borne and therefore used to assess active managers’ performance) - If we accept that the small cap market is relatively inefficient (in terms of availability/dissemination of information) this ought to enable skilful managers to generate added value more effectively than in the large cap area, and
- Illiquidity - Smaller companies are less liquid investments than larger companies which increase the volatility of these stocks. On the plus side, arguably it should be possible for investors to capture a liquidity premium (an additional return for investing in an area that is not as readily tradable).

The graph below is a study by Fama & French who identified that there is a long term premium involved as a result of holding small cap stocks. The diversification benefit is also underlined as the smallest stocks have the lowest correlation with the market index.



Source: Fama, Eugene F.; French, Kenneth R. (1992). "The Cross-Section of Expected Stock Returns". *Journal of Finance* 47 (2): 427–465

It must be noted however that there is also much academic literature which would argue that the 'small firm' effect outlined above does not exist and the evidence outlined by Fama & French may in fact be random

4.2.3 Emerging Markets Debt/Equity

A country is defined as Emerging if they are low or middle income per capita (as defined by the World Bank) countries and have satisfied that definition for 2 consecutive years (not necessarily the last 2 years). To be eligible for removal, the country must have failed this criterion for 5 consecutive years.

Emerging markets are seen as the engine of growth for the global economy. In fact, there is the potential for both China and India to surpass the US as the world's largest economy within the next 10 to 20 years. The stronger growth, dynamism and population of these economies should present attractive investment opportunities for companies located therein. This relatively high expected growth can be attributed to the following:

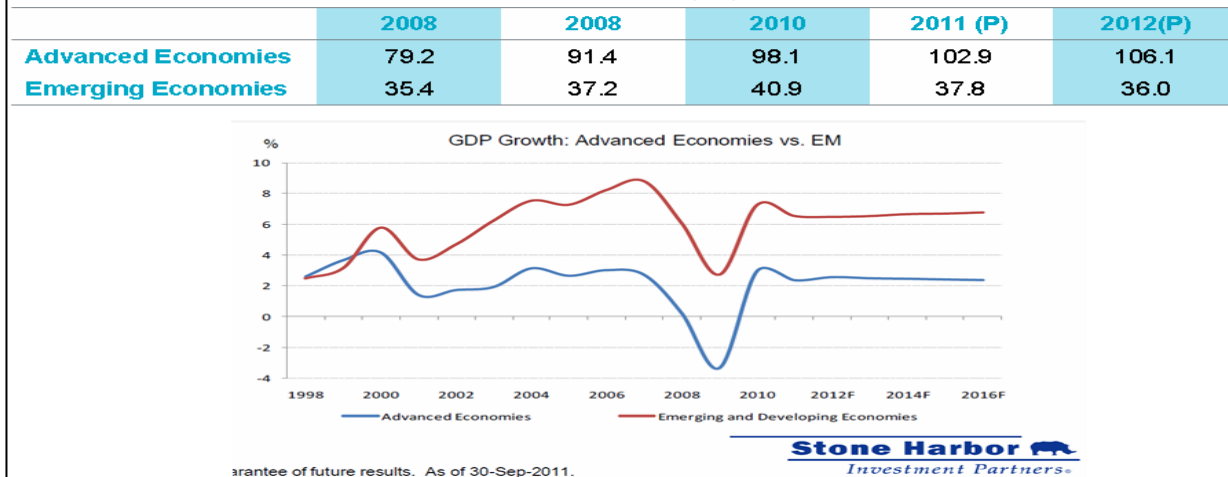
- Demographic factors – the population growth in many emerging markets is stronger than in the developed world. Also population ageing is projected to be a smaller drain on future growth in emerging economies than in the developed world (especially Europe and Japan),
- Currency – emerging market currencies are expected to appreciate against western currencies. Hence investors who choose not to hedge emerging market currency exposure would expect to benefit from this currency exposure over the long term,
- The emergence of a consumption-oriented middle class within emerging markets is helping to drive growth in domestic demand,
- The enormous pool of cheap labour means emerging market countries are extremely competitive against developed economies in manufacturing and increasingly in services, and
- Finally, emerging markets are now better placed to deal with periods of economic difficulty given their stronger fiscal positions relative to the debt-laden western economies.

However, it is important to be aware of the specific risks associated with emerging markets. These include:

- currency risk (returns are non-euro)
- political risk (as with all emerging economies, governments can be unstable and intervention in the financial markets is possible),
- weaker corporate governance structures in the underlying companies (less regulation and transparency relative to developed market companies), and
- higher corruption levels across both private and public sectors etc.

The table below highlights that emerging economies have not become debt burdened as developed economies have in recent years and as such are in strong shape to tackle any future slowdown. The graph shows the GDP growth of advanced and emerging economies since 1998 and forecasted into the future.

General Government Gross Debt to GDP (%) - IMF



Source: Stone Harbor Investment Partners

4.2.4 Low Volatility Equity

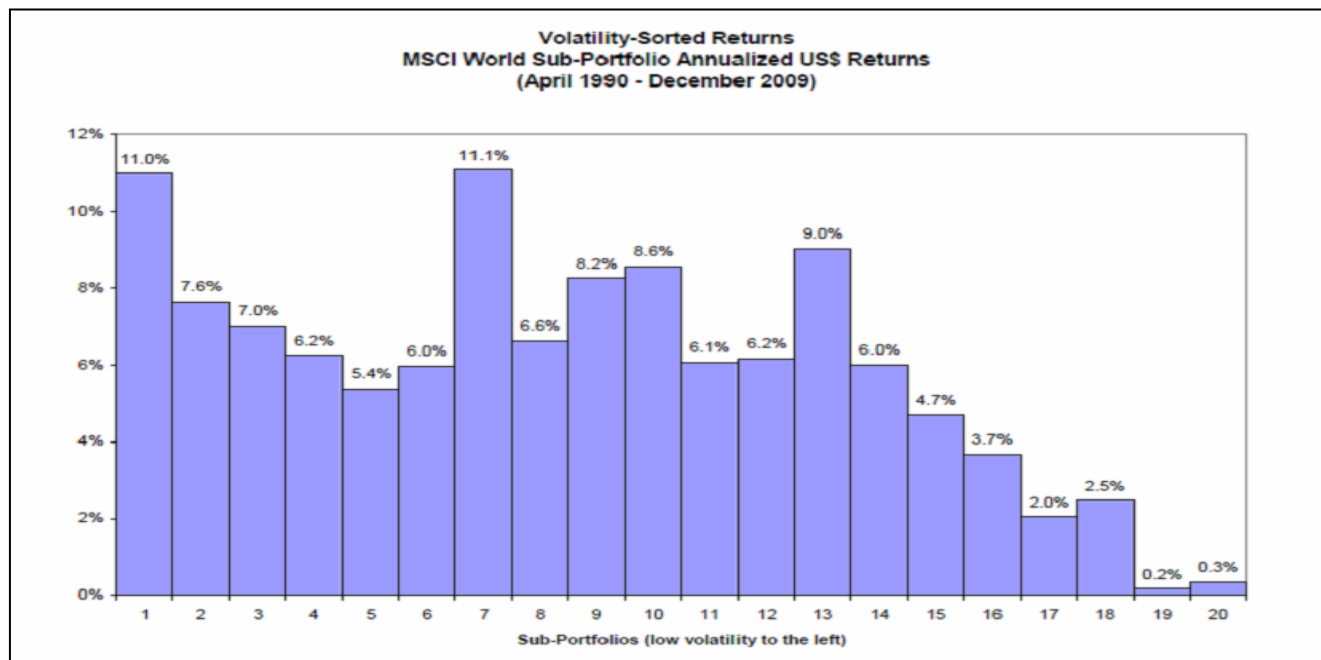
'Low volatility' strategies are those which generally meet the following criteria:

- Systematically low correlation to developed global equity indices through the market, cycle, with stronger relative performance in down-markets and weaker relative under performance in up-markets,
- Expectation to produce stronger relative performance when higher risk strategies (such as emerging markets or small caps) suffer from a "flight to quality" situation, and
- Returns similar to that of the wider global equity market over the long term.

A typical low volatility strategy would aim to exhibit approximately 75% of the risk of core broad market developed equity strategies (these strategies may include other asset classes that may target cash plus type performance instead of performance relative to a given equity benchmark).

It may be intuitively difficult to accept that we can expect similar returns from an equity portfolio with lower risk. However, there is an increasingly robust body of evidence, based on historical analysis and academic work, which supports the view that low volatility equity portfolios can be constructed which do not represent a material compromise on expected return (see graph below). These low volatility equity portfolios can be structural (i.e. systematically building a portfolio of the lowest risk (volatility) stocks), or they can be more intuitive (i.e. building a portfolio based on fundamental principles which has demonstrably strong defensive characteristics such as 'quality' stocks. Of course, while 'quality' stocks do tend to be defensive in nature this cannot be taken as a given e.g. banks were considered quality stocks before the current crisis.

The graph below highlights how the least volatile portfolios outperformed over the period in question (April 1990 – December 2009). This highlights the fact that risk and return are not always inextricably linked. For example, the highest volatility sub-portfolio on the right hand side of the graph (#20) returned 0.3% p.a. over the period in question, while the lowest volatility sub-portfolio (#1) returned 11.0% p.a.



Source: State Street Global Advisors (SSgA)

4.2.5 Corporate Bonds

4.2.5.1 Key Characteristics

Investment in corporate bonds involves investing in debt issued by companies rather than governments. These investments are made via loans to individual companies where both regular interest payments (coupons) and repayment of principle in full at maturity are payable to the investor. Companies are generally perceived as riskier than governments and the greater the perceived risk, or lower credit rating, of a company the higher the yield required as compensation for that risk. Of course, in the current climate, this is not always the case as some corporate bonds may be viewed as less risky than the sovereign.

Coupons and maturity payments on debt holdings issued by the company are made before any equity payments so corporate bonds would generally be regarded as a less risky investment than equity investment. As such the expected return is also lower than that of equity investment.

Corporate bonds are not a risk free investment however as individual companies may fail and ultimately default on repayments therefore it will also be important to ensure an allocation to a diversified range of corporate debt.

Corporate balance sheets are now more robust and continue to improve, with better earnings and cash flows to support interest repayments. Interest rates are also likely to stay low as governments attempt to stimulate stagnating economies.

One category of corporate bonds is “High Yield Bonds” which are corporate bonds that have credit ratings below investment grade (BB+ and lower). In terms of risk and return profile, High Yield falls between equity and investment grade bond investing. High yield bonds tend to outperform other fixed income assets in the recovery phase of the economic cycle, and should be expected to under-perform when an economy moves into recession.

4.2.5.2 Absolute Return Funds

Absolute return funds are funds that are made up of one or more underlying strategies. These are mainly called absolute return funds as they aim for positive performance under all market conditions. These strategies tend to be heavily reliant on the skill of underlying managers in achieving out-performance. The underlying strategies fall into several categories, some of which we have summarised below:

- **Fixed Income based:** managers of these strategies will try to exploit opportunities within the fixed income universe to target absolute returns. Investments may include high yield debt and private debt.
- **Currency:** managers of currency strategies will try to exploit changes in exchange rates to the benefit of the fund.
- **Equity based:** managers of these strategies will take both long and short positions on individual stocks or in parts of the stock market, with the intention of generating positive performance whether the overall market rises or falls.
- **Multi-strategy:** managers of these strategies will employ a number of underlying strategies dependent on perceived opportunities across all markets. Managers use strategies such as systematic trading, relative value and event driven investment.
- **Commodities:** managers of these strategies attempt to identify opportunities within commodities (including energy, agriculture, metals etc.) and the commodities futures market.

It is generally expected that each of the underlying strategies exhibit returns of a magnitude broadly similar to equities but with varying volatility. The combination of multiple strategies should diversify the sources of return depended upon by the portfolio (away from a large reliance on the equity risk premium), reducing the overall risk to the portfolio. In the current climate, strategy and manager selection is more important than ever before as many perceived ‘absolute return’ strategies have proved to be highly correlated with equity markets during the recent periods of market stress.

SUMMARY

- ❖ Investors are increasingly looking beyond developed market equities for sources of return as a result of the market volatility over the past few years and opportunities arising in other areas.
- ❖ Popular asset classes that have emerged in recent times include Low Volatility Equity, Emerging Market Equity, Emerging Market Debt, Absolute Return and High Yield Debt.

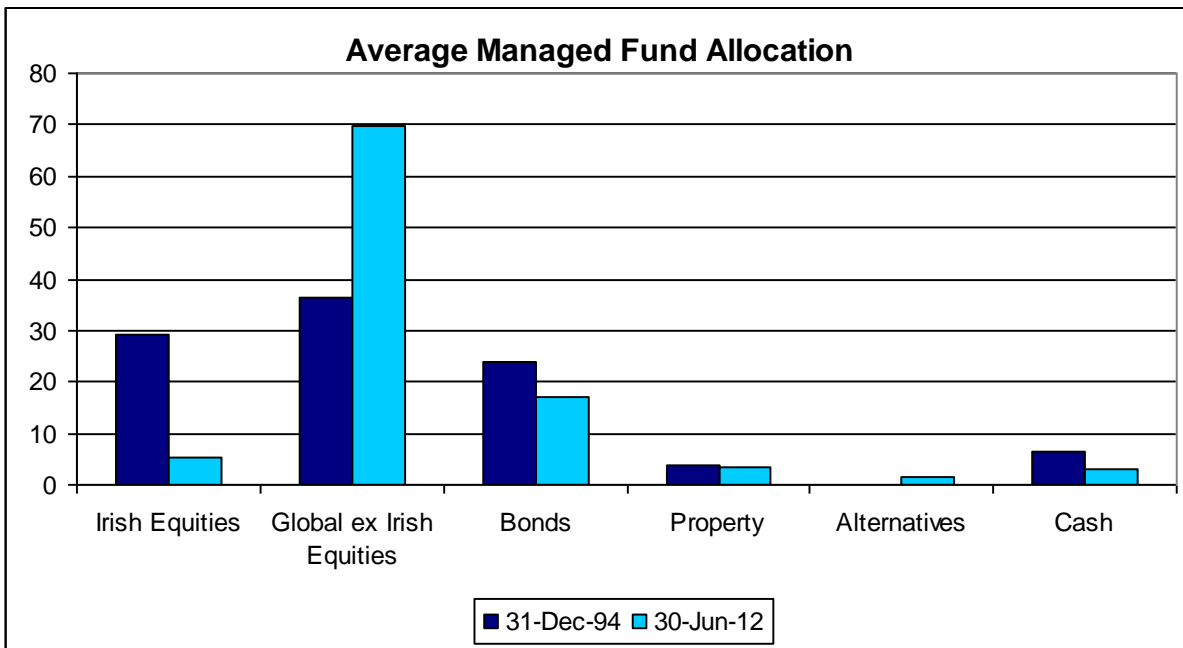
4.3 Investments and Defined Benefit Pension (DB) Schemes

4.3.1 Investment Strategy

Evolving over the years

Over recent years a number of factors have led pension fund sponsors and trustees to address investment strategy issues in a more fundamental way.

In the past, the majority of Irish pension schemes invested in Managed Funds only. These are multi-asset funds which invest primarily in equities, bonds and property. Managed Funds had high concentrations to Irish equities and Irish property which benefited pension schemes during the high growth years of the 1990s/2000s but this was reversed in later years. The actual allocation to each asset class was driven by a peer group of Managed Funds in the Irish market and, therefore, trustees had no control over this allocation. The table below shows the asset allocation of the peer group of Managed Funds in December 1994 compared with June 2012 (*Mercer Market Insight Surveys*)



The sharp falls in Irish equities since 2007 is a key factor which has driven the re-weighting to global equities. Irish equities have returned c.-65% since 1st January 2007 to end October 2012.

The vast majority of pension schemes (65% according to the IAPF Pension Investment Survey 2011) are no longer invested in these Managed Funds and trustees have taken more control of their investment strategy by putting in place scheme specific benchmarks (or investment strategies) for investment managers based on their pension scheme's requirements.

In recent years, falling bond yields, poorly performing equity markets, increasing longevity and the increased rigour of the Minimum Funding Standard solvency regulations has placed a

far greater emphasis on short-term risk management for both sponsors and trustees than had previously been the case. In addition, the Irish Association of Pension Funds (IAPF) guidelines advise trustees to review their investment strategy based on their risk/return preferences at least every three years.

Unfortunately, many pension schemes are currently underfunded. The main reasons for this are generally thought of as being three-fold:

- Asset values have reduced as stock markets trended downwards,
- Liability values have increased as bond yields reduced, and
- Longevity has increased.

Investment strategies can be broken down as the balance between the “growth portfolio” and the “matching portfolio”. These portfolios are discussed in the next sections.

4.3.2 The Growth Portfolio

4.3.2.1 Growth portfolio

The role of the Growth Portfolio is to harvest multiple sources of return. The return objective is to generate long-term returns commensurate with (or above) listed equities but do so with lower risk. By gaining exposure to many sources of return will reduce the fundamental risk of the portfolio and can be helpful in reducing portfolio volatility. The focus is on approaches that may be able to reduce the relative volatility in investment returns and at the same time aim to do so without compromising expected return (see example below).

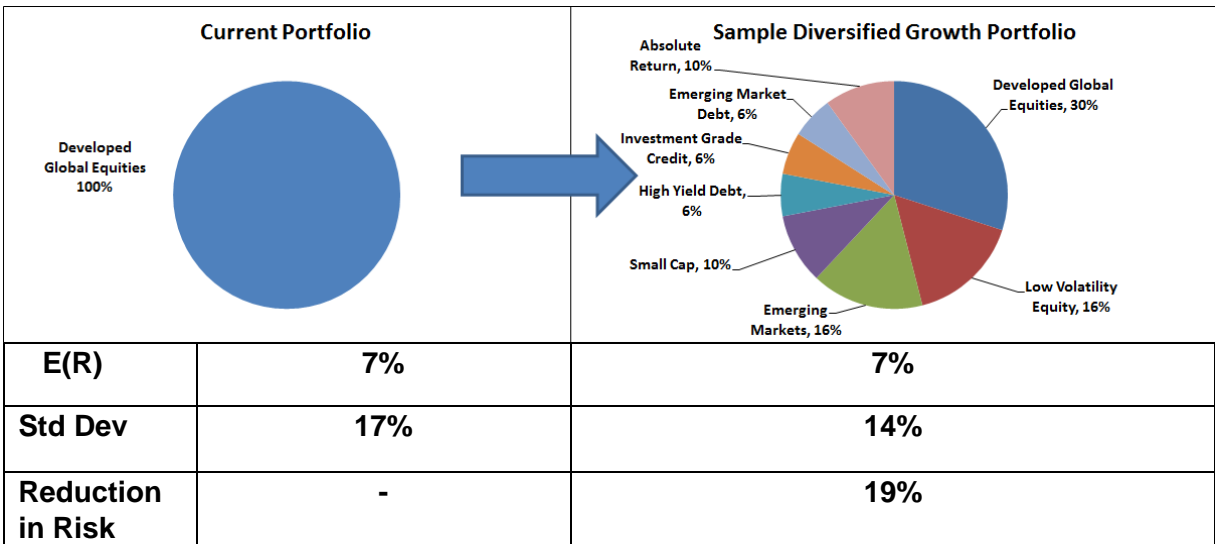
The Growth Portfolio may contain a mixture of beta and alpha sources from traditional and alternative asset classes, to provide capital appreciation and to deliver a diversified return in excess of a low risk liability-matching portfolio. As mentioned earlier, alpha arises as a result of manager skill whereas beta is the return that arises as a result of market movements. Some of the asset classes that tend to be used in the growth portfolio have been discussed in Section 4.2.

4.3.2.2 Typical diversified portfolio

Investors are increasingly recognising that we are in the midst of fundamental changes in the economic and investment environment. This brings with it opportunity but in an environment with heightened uncertainty.

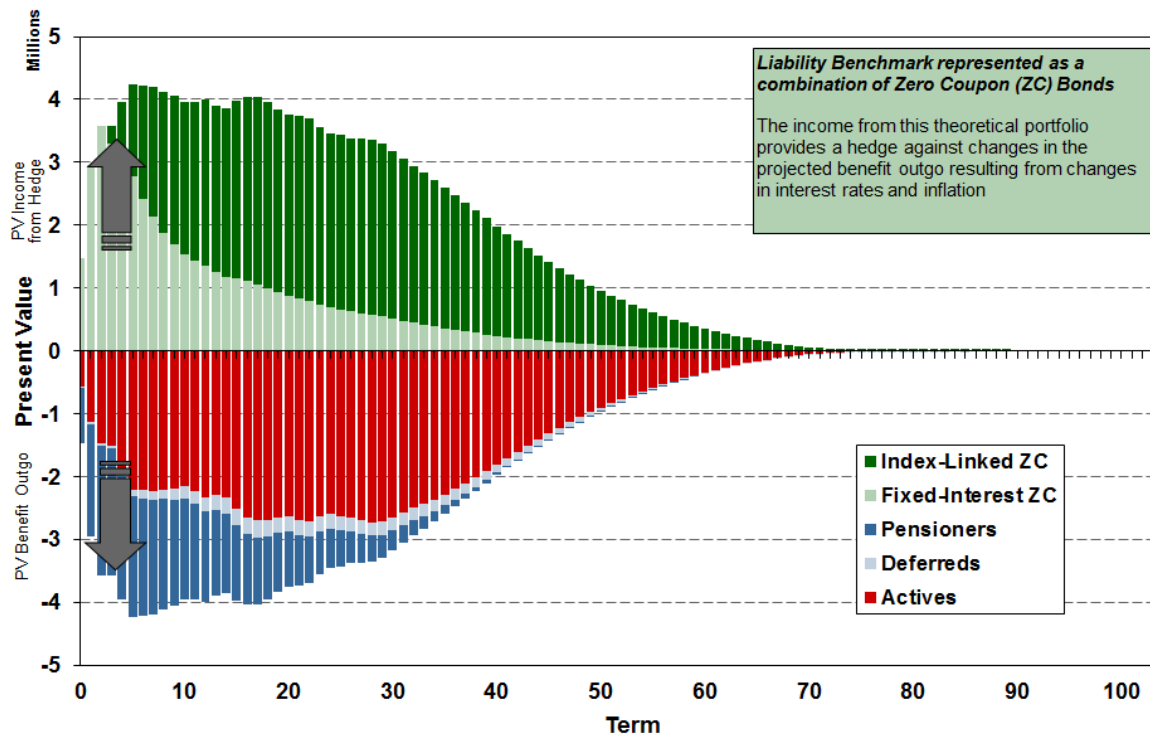
Below is a graph of what a diversified growth portfolio may look like and how this may have performed relative to a developed global equity portfolio in the past. The allocations to each of the different areas will depend on an investor’s overall risk tolerance and their objectives for the growth portfolio. Of course, active versus passive management in each area and manager selection are additional decisions that investors are faced with. All assumptions and

returns used below are indicative only but certainly do help to highlight the benefit of diversification.



4.3.3 The Matching Portfolio

The ideal matching portfolio of a pension scheme is a bond portfolio that has payments which exactly mirror the payments arising from the scheme liabilities.



In practice, exact cashflow matching is difficult and impractical to achieve without continuous hedging techniques. In light of this, a compromise may be to have a portfolio of bonds with the same duration and inflation linkage as the liabilities of the pension scheme. There will, however, still be many factors that cannot be matched in advance through investment policy e.g. mortality experience, membership movement, salary inflation etc.

4.3.3.1 Risks within the matching portfolio

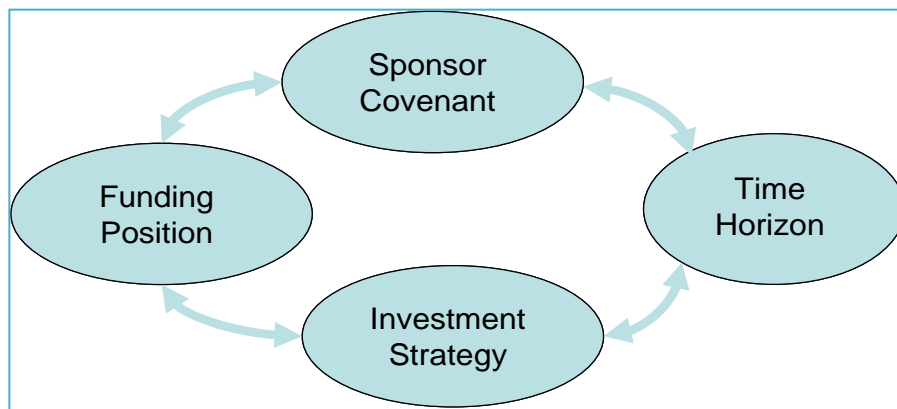
- **Duration mismatch:** This is a common occurrence in the matching portfolio of Irish pension schemes in particular. This occurs whereby, without the use of derivatives, schemes cannot employ physical bond holdings of a long enough term to match the liabilities of the pension scheme due to either non-existence or illiquidity,
- **Credit risk:** The optimal matching portfolio comprises of bonds of a high credit quality. Even the core Eurozone countries (e.g. Germany, France and the Netherlands) have not escaped the current crisis and have an element of credit risk attached. These would, however, typically still remain as the foundations for the majority of matching portfolios,
- **Inflation risk:** This is another risk schemes often attempt to match, through physicals or through a swap overlay. Inflation mismatch between Eurozone and Irish inflation is an obvious concern here due to lack of available inflation linked Irish bonds in the market place, and
- **Currency risk:** Diversification is becoming ever more important in matching portfolios. International diversification is being looked at more and more but this does introduce the additional layer of complexity through the currency risk attached given the liabilities of Irish pension schemes are most likely 100% in Euro.

4.3.4 Risk Budget

Setting an appropriate investment strategy (i.e. high level split between matching and growth assets) for any pension scheme involves a trade-off between risk and expected return relative to the pension scheme's liabilities. The main aim is to minimise investment risk while targeting the required level of expected return.

It is important that the Trustees have a clear understanding of the risk/return balance inherent in the investment policy and that the on-going suitability of this balance is kept under regular review in the light of the trustee's and (where appropriate) the sponsor's objectives.

The key influences on a pension scheme's investment strategy are sponsor covenant, current funding position and time horizon.



More detail on the main considerations in setting investment strategy is set out below:

- **Sponsor Covenant:** The strength of the sponsor covenant is critical in determining the amount of risk that can be taken within the investment strategy. If the sponsor covenant is strong, trustees have the freedom to adopt a greater degree of investment risk as they have more certainty that if the funding level decreases the sponsor will step in and invest more money in the pension scheme. If the sponsor covenant is weak, the preference is for a low risk investment strategy. However, this is not always achievable.
- **Funding Position:** The investment strategy set should be expected to achieve the level of investment return required to meet scheme benefits with a reasonable degree of probability. In general, the higher investment return required, the higher the level of risk required to achieve that return.
- **Time horizon:** Any deficit will need to be reduced through a combination of investment returns and contributions over a specified period. If a longer expected time horizon is acceptable then the pace of contributions may be reduced and/or a lower risk investment strategy (with a corresponding lower expected return) can be implemented. Regulation (e.g. length of funding proposals) can dictate the time horizon which a pension scheme has to meet any funding shortfall.

Essentially, the appropriate investment strategy to adopt is a result of the analysis of the funding and sponsor covenant positions and the time horizon for the scheme.

The following case studies highlight how investment strategy may vary from one scheme to the next.

4.3.5 Case Studies

4.3.5.1 Case Study 1: Viable pension scheme with strong sponsor covenant

For a viable scheme with a strong sponsor covenant, the objective of the Trustees is to protect member benefits.

An open scheme's risk tolerance is much higher and can target a relatively high equity allocation while a closed scheme is likely to target de-risking in some form as the scheme matures (whether this may be as a result of regulation or Trustee's preference). Closed schemes in particular will look to achieve an end position of 100% funded with a matching portfolio that will move in exactly the same way as the pension scheme liabilities.

In this instance, the matching portfolio is likely to consist of core Eurozone bonds in the first instance (e.g. Germany, Netherlands and France) as the credit risk attached to lower rated sovereign and corporate debt may outweigh the relatively attractive yields from a liability matching point of view. Derivatives can be used to extend the duration of the matching portfolio or to introduce an inflation overlay, in particular for schemes with higher governance budgets.

While longevity swaps are very new to the Irish marketplace with very little or no uptake to date, these have been successfully introduced overseas and we can see these becoming more and more popular as Irish schemes mature further.

4.3.5.2 Case Study 2: Section 50 Pension Scheme

When a pension scheme submits a "Section 50 application", it means that the scheme has requested that changes can be made to members' accrued benefits. If the Pensions Board approves this application, the pension scheme usually has to target a specific investment return over a certain period.

The pension scheme's sponsor commits to a given level of contributions for the pension scheme. Therefore, there is limited flexibility to cope with future deficits which the pension scheme may face.

A higher level of matching assets is considered more appropriate in order to minimise volatility and reduce the potential of future investment losses (e.g. if the funding proposal goes off track) which may fall directly onto members as the sponsor has only committed to funding a particular amount. Trustees have to monitor the progress of the funding level much more closely so that they can react quickly to any changes.

4.3.5.3 Case Study 3: Sovereign Annuities/Sovereign Bonds

As discussed in the Pensions section of this paper, sovereign annuities and sovereign bonds are now available for Irish pension schemes to invest in. The main advantage of sovereign annuities will be the ability for a scheme to avail of more affordable annuities than traditional annuities. The main advantage of sovereign bonds is that the valuation of the liabilities may reduce as they can be discounted using a higher yield (implying a lower value). Both come with obvious risks attached.

Before buying sovereign annuities, pension schemes will look to protect the capital value of the assets backing the pensioner liability to avoid a further deterioration in the coverage ratio of active/deferred members, and this means that the non-growth portfolio for the pensioner liabilities should be invested in cash until such time that these pensioner liabilities are crystallised by purchasing annuities from an insurance company.

For a scheme going down the sovereign bond route, the matching portfolio will consist of the qualifying bonds as defined by the regulatory guidelines.

4.3.6 De-risking Options

Current economic and regulatory conditions mean de-risking of investment strategy should be considered by all schemes.

- Economic conditions mean that the scope to absorb funding shocks has greatly reduced.
- There are regulatory pressures in Ireland and the UK for pension schemes to become more sustainable e.g. the addition of the risk reserve requirement recently for Irish pension schemes to provide a cushion against adverse market movements which encourages de-risking.

Schemes which are unable to afford immediate de-risking can put de-risking plans in place in order to meet regulatory requirements and withstand future volatility.

4.3.6.1 Putting De-risking Plans in Place

There are many approaches a pension scheme can adopt to put a de-risking plan in place. The options discussed here are:

- Dynamic,
- Yield based, or
- Time-based.

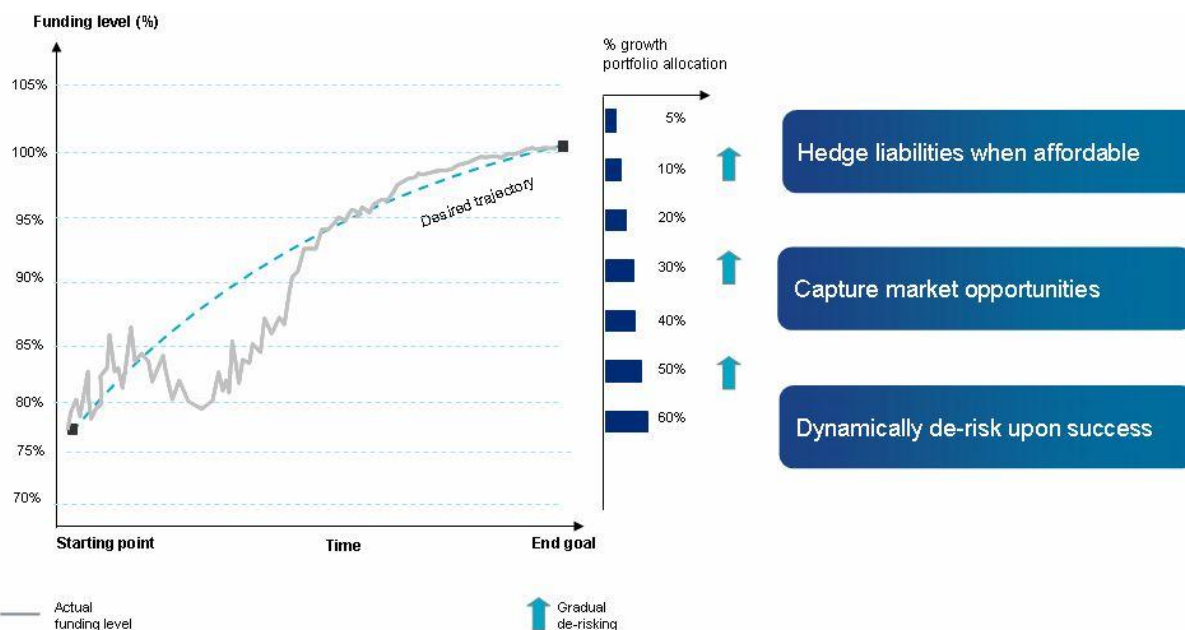
Dynamic De-risking

The Trustees could adopt a mechanism for de-risking which is dynamic and preferably linked directly to the funding position of the pension scheme and referenced to market conditions. Which basis to target (economic/on-going/MFS etc.) is a decision that is critical to the process. Many schemes would see an economic basis as an endgame (particularly for closed schemes) but may aim to have an interim step using a margin above this in order to have a more achievable de-risking plan. An economic basis is where the liabilities are valued using “least risk” bond yields.

A dynamic framework seeks to identify trigger points that would potentially allow “affordable” de-risking of the investment strategy to take place by “banking gains” and

switching from growth assets and into matching assets when appropriate to do so. These trigger points are set around a flight path which extrapolates the expected development in funding level based on the underlying assumptions.

When the pension scheme experiences a favourable outcome from actual investment returns versus the development in the liabilities such that it is better funded than it would expect to be based on the flight path, there is scope to reduce the level of investment risk to a lower level and 'bank' this 'outperformance'. This is illustrated by the chart below.



Source: Mercer

Of course market experience may go the other way and result in the funding level diverging from the original plan set out. It is important that the de-risking plan is kept under regular review for this reason so that it remains appropriate.

Downside protection is a tool that has been used for pension schemes, particularly in the UK. This would typically consist of a series of put options which would move a proportion of the equity holding to cash should markets fall to a certain level. There are many arguments against downside protection, however, as the cost of protection may outweigh the benefits attached.

Yield-based De-risking

Yield based de-risking occurs when Trustees automatically invest in highly rated government bonds from either peripheral bonds or growth assets when a target yield reaches a certain level. This meets the need of clients that want and need to de-risk into highly rated government bond portfolios but find current yields far too unattractive.

For example, a pension scheme may only want to de-risk from Italian into German bonds when the German 10 year bond yield exceeds 2.0%. There may be a further purchase if this yield goes above 3.0% etc.

One disadvantage of this de-risking method relative to the dynamic method is that there is no direct reference to the scheme liabilities, although it can be argued that there is an indirect link.

Time Based De-risking

Time based de-risking is a less complex alternative method for pension schemes with reduced budget (both in terms of finance and time) to implement a de-risking framework. An example of this approach may be to de-risk 5% every 6 months until the de-risking goal is achieved.

Obviously, unlike the dynamic option, de-risking may come at an inopportune time for a pension scheme (e.g. if the funding level is lower than expected switching from bonds to equities may not be ideal for a pension scheme which might struggle to make up the gap with increased contributions).

De-risking Summary

It is quite possible that a mixture of the 3 types of de-risking plans can be incorporated into one design. For example, a pension scheme in a funding proposal may need to de-risk from equity to bonds irrelevant of market conditions but would like to de-risk on strength and efficiently should the opportunity arise. In this case, a time-based plan with a dynamic overlay may be suitable. Yield-based triggers may also be set out in order to move from peripheral to core Eurozone bonds within the bond portfolio in order to take advantage of yields converging back to more historic norms.

A key aspect of an investment de-risking framework is the implementation method. Key considerations with respect to the implementation method are the frequency of monitoring, how any de-risking action is taken and the level of trustee oversight which is desired. Of course, it is also important to keep the de-risking plan itself under regular review so that it remains appropriate should adverse market experience occur.

We are increasingly seeing clients seeking to delegate a degree of the funding level monitoring and implementation of the de-risking mechanism to a third party to avoid trustees having to meet as regularly, reduce the trustee governance budget and reduce the risk of missing opportunities through more frequent funding monitoring.

SUMMARY

- ❖ Falling bond yields, poorly performing equity markets, increasing longevity and the increased rigour of the Minimum Funding Standard solvency regulations have placed a far greater emphasis on short-term risk management for both sponsors and trustees.
- ❖ De-risking from “growth” to “matching” assets has become a priority for many schemes as a result of economic and regulatory pressures. This leads to many schemes putting de-risking plans in place (as they cannot afford to de-risk immediately).
- ❖ Least-risk bonds/swaps remain the core element of the optimal “matching portfolio” despite the historically low yields due to the liability cashflow matching aspect.
- ❖ Schemes in wind-up or going down the sovereign bond/annuity route require special attention.
- ❖ Increasingly, the role of the growth portfolio for pension schemes is to harvest multiple sources of return, aiming to minimise volatility through suitable diversification.

4.4 Investments and Defined Contribution (DC) Pension Schemes

4.4.1 General Background

The Irish DC pension market is evolving quickly, driven by strong growth in DC pension scheme assets, increased compliance and regulatory requirements on DB pension schemes, as well as changing market conditions. DC pension schemes now account for nearly 40% (IAPF Pension Investment Survey 2011) of all pension scheme assets compared with just 26% in 2000 (IAPF Pension Investment Survey 2000).

Over recent years a key concern is that investment returns have not kept pace with inflation. For example, over the 5 years to end June 2012, the FTSE World returned -0.9% per annum, in Euro terms, while inflation was at c0.6% per annum. Therefore, if a member was predominantly invested in equities, the value of a member's pension pot would have reduced. In addition, the cost of buying a pension (as measured by annuity prices) has been increasing which again reduces the 'pension purchasing power' of a member's account.

There is now a much greater focus on investment risk, diversity of fund choice and emphasis on member communication and education. The Irish Association of Pension Funds (IAPF) guidelines states that strategic investment reviews should be undertaken at least every three years.

4.4.2 Investment Strategy (i.e. fund range) for DC Schemes

Like DB Schemes the majority of investment risk and return arising for members will be due to asset class choice (i.e. whether the member invests in equities or bonds or cash) and so it is very important that pension schemes have an adequate range of funds available for members.

In determining an appropriate fund range, the following five primary risks faced by members should be considered:

- **Annuity Risk:** The risk that a member's fund value does not change in line with interest rates underlying the cost of purchasing an annuity at retirement. The ARF option does avoid this risk and certainly brings another dimension to DC and AVC investments but market, manager, inflation and longevity risk are all borne by the member in this case,
- **Real Growth Risk/Inflation Risk:** The risk that investment returns fail to keep pace with price inflation over the long term,
- **Investment Manager Risk:** The risk that active managers underperform their respective benchmarks,

- **Market Risk:** The risk that volatile markets, particularly in the period before retirement, lead to uncertainty over the pension or lump sum benefit likely to be received, and
- **Liquidity risk:** The risk that a member cannot redeem their assets when required.

The main aim is to provide a range of core fund options that minimise these risks and provide members with a degree of diversity in terms of asset type. Trustees need to find the appropriate balance between on the one hand offering too few funds to cover the main risks facing members, and on the other hand offering too many funds (thus over-complicating the delivery of information to members). The appropriate balance will differ from company to company, depending on the size and nature of the membership.

No single asset class provides protection against all risks. In addition, these risks do not apply evenly throughout the working lives of pension scheme members.

Usually DC pension schemes aim to have at least the following options:

Category	Purpose / Goal	Typically Used
Equity	High long-term growth above inflation	Members with more than 10 years to retirement
Diversified Growth	To provide investors with long-term growth above inflation, but with lower volatility than an all-equity option	Members with more than 10 years to retirement
Long Bond	Expected to move broadly in line with pension cost movements	Members nearing retirement
Cash	Minimise capital risk, to the extent possible	

If a member does not make an investment election of their own, their contributions are invested in the nominated investment default option for that pension scheme. Providing an appropriate default fund is a key element of DC arrangements and is underlined by investment regulations. It is an accepted feature of DC investments that the bulk of members' retirement accounts will end up invested in the default investment option.

When selecting a default investment option for a pension scheme, trustees may try to achieve a balance between longer-term growth needs, on the one hand, and risk management closer to retirement on the other. The challenge is to achieve such a balance

within a single product or strategy. As such, a lifestyle strategy has become the main default option for most pension schemes.

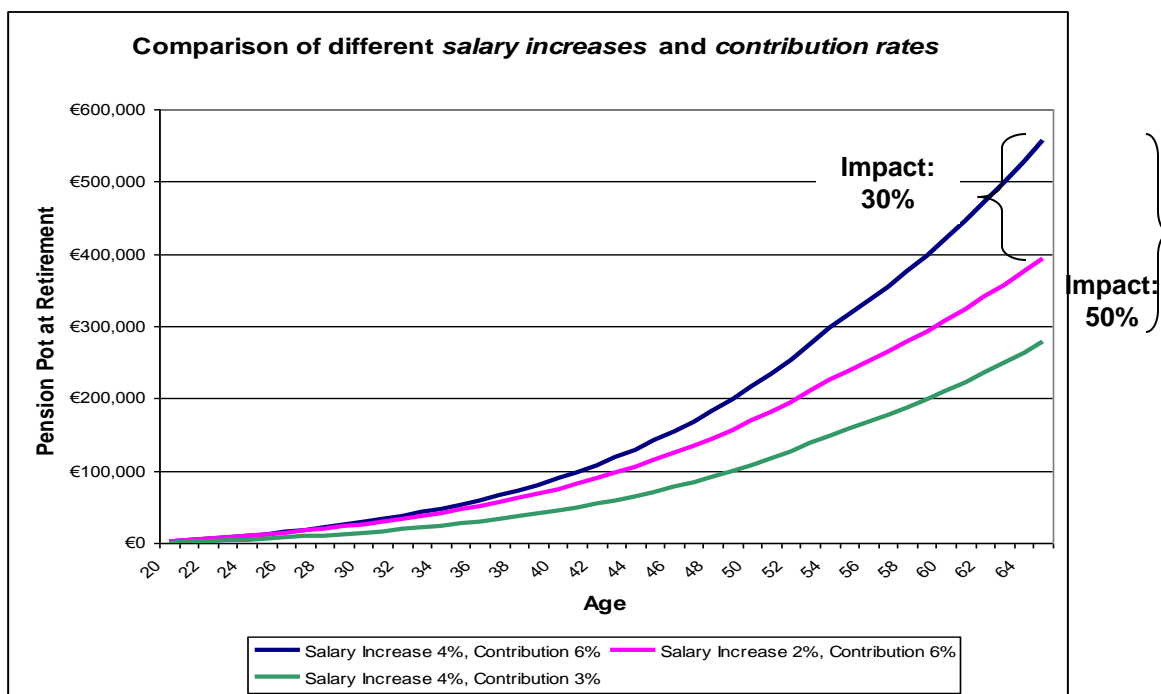
4.4.2.1 Lifestyle strategy

A lifestyle strategy is a pre-agreed process whereby, as a member approaches retirement (typically over the last 5 to 10 years) the members’ assets are switched automatically from higher risk funds to lower risk funds. As a result, a lifestyle strategy looks to address the fact that the investment risks faced by members changes over their careers.

4.4.3 Main Challenges Facing DC schemes

4.4.3.1 Insufficient income at retirement

It is important to note that neither specific investment funds nor lifestyling can ensure an adequate level of retirement income – this can only be addressed by a combination of adequate contribution levels and prudent investment. For example, the chart below shows the impact of salary increases and contribution levels over a member’s lifetime on their pension pot at retirement (Assumptions – Starting Salary: €25,000, Investment Return 6% up to age 55, 4% thereafter):



4.4.3.2 Fund Range

Inadequate spread of asset classes

Asset allocation within balanced funds may be limited to large cap equities, bonds, cash and domestic property, whereas exposure to a broader range of asset classes (for example, a mix

of currencies, hedge funds, commodities, forestry etc.) is now possible in the Irish market. Asset class choice is a bigger contributor to overall investment return/risk than manager choice.

Clustering

Fund ranges often feature too many balanced fund options or equity options while having inadequate coverage or choice in other zones of the risk/return spectrum.

Inappropriate Default Option

Balanced funds are no longer viewed as an appropriate default option because of the fact that they can hold over 70% in equities and have no link with a member's personal circumstances.

Poor manager choices

Fund managers may be chosen or retained for the wrong reasons. Trustees should ask themselves whether the current manager or managers would be selected if the pension scheme were appointing its managers anew.

Illiquidity

In certain cases a managed fund may be invested in property or another asset class that can be difficult to trade at certain times. When this happens the manager may be unable to redeem the full value of the units held by pension scheme members. In such cases the member receives a delayed or incomplete redemption, which poses a difficulty for members.

4.4.4 Hot Topics

4.4.4.1 Cash Funds

Many members invest in cash funds as they approach retirement as usually a proportion of the member's DC balance at retirement is taken as tax-free cash lump sum. It is widely expected that investing in a cash fund will not lead to negative returns.

However, the recent decision by the European Central Bank (ECB) to lower the interest rate at which Eurozone banks can place deposits with the ECB from 0.25% to 0% has had a knock on effect on the yields available on high quality cash strategies. When the investment manager's fees are deducted, it means that in many cases, cash funds will be marginally negative after fees, and so members' balances in cash funds will have reduced.

It is possible to invest in cash funds which offer higher yields but these funds invest in more risky banks. Individual Irish banks, for example, have to offer notably higher deposit rates than their international counterparts in order to attract funds. Given that the aim of a cash fund is to offer members a means of minimising market volatility in the approach to

retirement, for that part of the member's balance being taken as cash, then these higher risk cash funds would not be considered optimal.

4.4.4.2 Bond Funds

The key reason why most members invest in bond funds is to provide better protection against fluctuating pension costs (or annuity prices). Annuity prices are based on the bond yields of the highest credit quality Eurozone countries.

One critical area which trustees are currently considering is whether their existing bond fund remains "fit for purpose", in light of the changing Eurozone bond markets and given that annuity prices are being based off the highest quality bonds.

4.4.4.3 White-labelling

Under white-labelling, DC members are invited to select from a range of investment strategies, each designed with advice to achieve a different investment objective, for example, "cautious" aimed at protecting asset values and "higher risk" aimed at achieving growth over the longer term.

Once the member has selected their desired strategy, schemes are then free within the confines of the strategy to appoint and remove fund managers as they see fit.

This concept is becoming increasingly popular as there is a strong argument that it increases efficiency by allowing schemes to make changes to the fund options without a costly communication exercise to members. It also helps to simplify the fund choice.

Schemes implementing this should still ensure the choice of funds are in the members' best interests, and meet statutory requirements.

4.4.4.4 Greater focus on Member Communication

We have seen lately a huge focus on member communication so that members can clearly understand the risks involved with their DC fund e.g. contribution adequacy, investment risk, annuity risk, mortality risk etc. The IAPF (Irish Association of Pension Funds) has quoted a lack of member education as the main threat to an adequate retirement fund and encourages the provision of projection tools, education sessions and well-structured DC pension schemes to help members to achieve this. Simplification of the current regulatory environment is also required for members.

A lifestyle strategy simplifies investment decision-making for the 'average' member and, crucially, manages investment risk automatically for the members, as he/she approaches the pension scheme's normal retirement age. However, no single approach will cater to each individual member's needs precisely.

It is vital that all risks are communicated to members and that they are confident that they are invested in funds (or an investment strategy) that are appropriate for their individual risk profile and term to retirement.

Members should be informed that changing their long-term investment decision in response to short-term market moves do not generally serve well - ad-hoc reactions may not lead to good decisions. Also, it is difficult, if not impossible, to 'time' when to move from an asset 'optimally'. Making more gradual changes can mitigate this 'timing risk' i.e. of moving when prices are lowest and so crystallising investment losses.

The IAPF believes that the responsibility for providing this information and education is shared by the State, employers, trustees, pension professionals, representative bodies and the individual members themselves.

4.4.4.5 Greater sophistication in default options

Behavioural finance highlights the key role of default as it has been and always will be relied upon by a vast majority of members. As outlined above, the balanced fund option, which has traditionally been used as a default option is no longer rendered suitable as a result of the high equity weighting, particularly for members approaching retirement.

Lifestyle strategies as discussed above, whose designs are based on advanced modelling techniques, are now accepted as the most suitable default option.

4.4.4.6 Increasing choice of products e.g. “diversified asset funds”

The growth in the DC sector has attracted more managers and indeed more product types for trustees to consider in their fund ranges. “Diversified asset funds” are becoming more and more popular with trustees and members alike.

These funds entail a mix between traditional asset classes (e.g. equity, fixed income) and alternative asset classes (e.g. absolute return strategies). The funds focus on providing a “cash +” type return which enables members to focus a given level of expected return with typically less risk than the traditional balanced fund option.

SUMMARY

- ❖ The Irish Defined Contribution (DC) pensions market is evolving quickly, driven by strong growth in DC pension scheme assets. DC pension schemes now account for nearly 40% of all pension scheme assets.
- ❖ With such asset growth has come much development in the DC pensions space in recent times.
- ❖ There is now a much greater focus on investment risk, diversity of fund choice (including more appropriate default options known as “lifestyle funds”) and emphasis on member communication and education.
- ❖ Many challenges remain, however, to ensure that members’ pension savings at retirement are adequate.

4.5 Investments and Insurance Companies

While the investment considerations of insurance companies have not been specifically addressed in this paper until now, it is important to note that the same broad considerations as discussed for pension schemes are likely to apply. The priority of liability matching for the assets set aside to cover policyholder liabilities remains the same albeit in a different context.

Whilst general insurance companies' policyholders' liabilities tend to be more short-term in nature, a life insurance company would have liabilities of a longer term. In both cases, a mixture between cash and bonds/swaps would typically make up the asset portfolio, the term and nature of which depending on the liabilities being matched. Derivatives are typical in more complex lines of business such as variable annuities etc. in order to match the guarantees underlying the products.

The issues surrounding the matching portfolio so far in this paper e.g. credit quality, historically low yields of core government bonds; cash fund returns etc. are likely to be the main investment issues facing insurance companies as well at present.

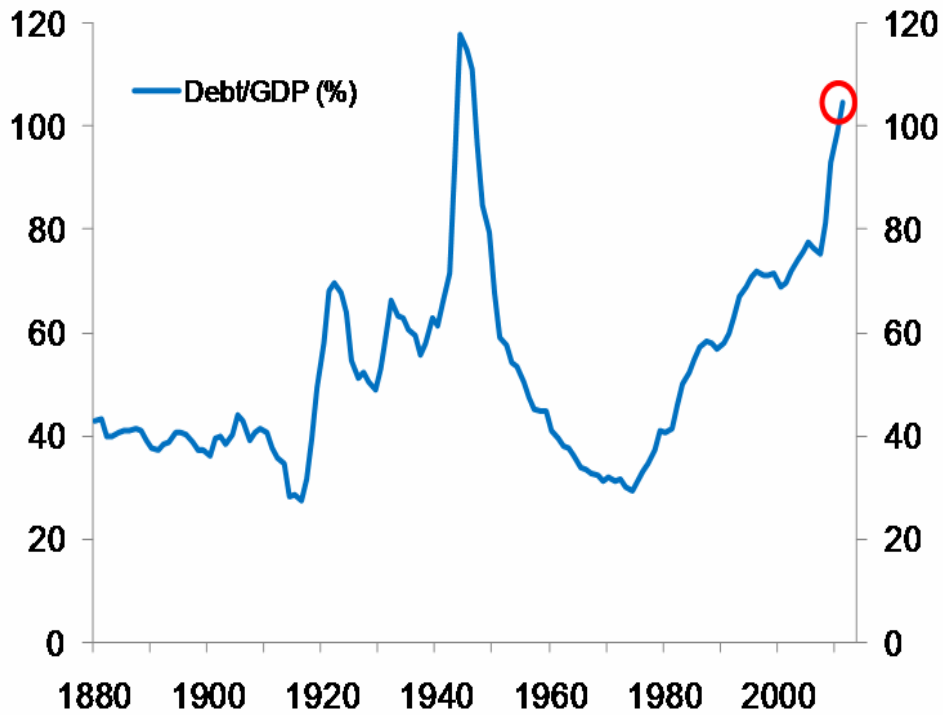
Regulation around admissibility rules and the credit risk capital required under the new solvency II regime will also have obvious impacts on investment policy for both life and general insurers.

4.6 Outlook

The financial crisis has dominated news stories over the last few years and is likely to continue in the same manner for some time. There has been a phenomenal policy response by both the ECB and the Fed to date which has resulted in much liquidity in the markets and has helped to alleviate the financial crisis to some degree, however political tensions and underlying debt problems in both the private and public sectors still remain.

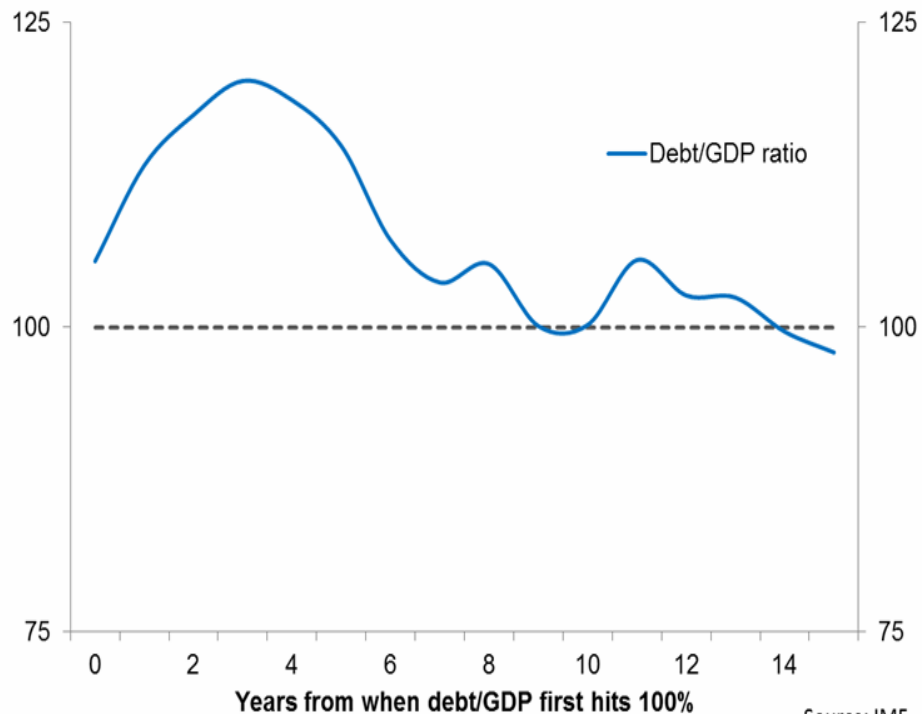
The amount of debt/GDP is at an all-time high, back to post WWII levels as can be seen in the graph on the left below and has given rise to the need for austerity measures as being experienced in many advanced economies at present. The study by the IMF in the graph on the RHS below shows that of advanced economies that have reached 100% debt/GDP in the past it has taken on average 10+ years to bring the debt/GDP back below 100%. Exceptions here are when there has been currency devaluation and/or strong global growth, both unlikely in the short-medium term as many countries are attempting consolidation at the same time and political frictions continue.

Public debt in advanced countries



Source: IMF

Typical trajectory of government debt after reaching 100% of GDP



Source: IMF

Note: profile is average of all 26 advanced country examples (since 1875) of debt/GDP reaching 100%.

The Spanish government continue to hold out to pressure to accept the Outright Monetary Transactions (OMT) program, whereby the ECB would commit to buying unlimited short term debt in return for Spain meeting certain fiscal conditions. Expectations remain that the Spanish government will eventually ask for financial support, whether this is voluntary or forced, although Germany's reluctance to give support and the current and upcoming regional elections may delay this even further.

Greece has come back on the radar as they have attempted to qualify for their next tranche of aid from the Troika. While key EU and IMF policymakers finally agreed on a solution and will part with the next tranche of aid over the coming months, analysts continue to remain sceptical as to whether the country can meet the targets set for them over the next few years. While it may be less likely than it was earlier in the year, an exit from the Eurozone in the short term remains a stark reality.

Globally, China's slowdown continues to spook investors as analysts continue to revise their GDP growth forecasts downwards. In the US, the recent action by the Fed, QE3, whereby the committee will continue its purchases of agency mortgage-backed securities and employ other policies where appropriate was generally well received by investors. The main talking point in the US is now how Obama will attempt to deal with the "fiscal cliff" the US will face in early 2013 amidst potential political deadlock that may hinder any resolution.

It is likely that an environment of sluggish growth, periodic financial flare-ups and exceptionally accommodative monetary conditions are likely to pursue for some time yet. While progress towards the fiscal and banking union in the Eurozone will be of interest to all, resolution of the US fiscal debate towards the end of the year will be of huge importance, as will Chinese growth prospects.

SUMMARY

- ❖ The financial crisis has dominated news stories over the last few years and is likely to continue in the same manner for some time.
- ❖ There has been a phenomenal policy response by both the ECB and the Fed to date which has resulted in much liquidity in the markets and has helped to alleviate the financial crisis to some degree. However, political tensions and underlying debt problems in both the private and public sectors still remain.
- ❖ Public debt/GDP is back up to post WWII levels in developing countries, a worrying sign for global growth if history is anything to go by.
- ❖ In the Eurozone, the future of Greece together with building pressure on Spain to sign up to the OMT program will be of interest to all as will progress towards a banking and fiscal union.
- ❖ More globally, China's growth story and a resolution of the US fiscal cliff debate remain of paramount importance.

5 Life Assurance

5.1 Market Update

The period since the last Current Topics paper (presented in early 2010) has been a very busy and challenging time for the Life Insurance industry. The continued turmoil in both the domestic and international economies has impacted consumer confidence and spending power which in turn has had a knock on impact on new business volumes. Amongst other things poor investment returns have negatively impacted unit-linked products while persistently low interest rates have meant that products with guarantees, which appeal to consumers particularly in times of uncertainty, prove to be expensive to provide and may be prohibitively costly for consumers.

In addition to these challenges the industry has been faced with a series of regulatory changes during this time, requiring substantial time and resource commitments from the industry. While a number of these changes have been driven by revisions to EU regulation and are discussed elsewhere in this paper (Solvency II, Gender Directive), there have been significant changes domestically (Fitness & Probity, Corporate Governance, Consumer Protection) that will be covered in more detail below.

This section will also address corporate merger activity and new and growing areas of life insurance.

5.1.1 Business Volumes in the Irish Market

Year	2007	2008	2009	2010	2011
	€'000	€'000	€'000	€'000	€'000
Single Premiums	5,487,162	1,916,898	1,104,391	1,432,907	1,314,921
Annual Premiums	316,969	227,997	162,855	152,309	136,275
Total Premiums (APE*)	865,685	419,687	273,294	295,599	267,767
With Profits	11,293	5,748	3,065	4,801	4,525
Savings/Investment	672,420	254,030	130,882	169,654	149,952
Protection	181,973	159,909	139,347	121,145	113,289
Total Premiums (APE*)	865,685	419,687	273,294	295,599	267,767

*APE = Annual Premiums x 10% of Single Premiums

Source: Milliman's Full Year Temperature Gauge figures

The period since the beginning of the financial crisis has been particularly hard for life insurers as the table above shows. Total premiums (APE) in 2011 were down 69% from the

peak in 2007. The most dramatic falls happened in 2008 and 2009 during the early days of the crisis. 2010 saw a modest recovery which was wiped out entirely in 2011 as the Eurozone debt crisis continued to rumble on.

Further analysis of the figures shows that there have been significant declines across all product types:

- With profits business, although a small part of the market, is down almost 60%,
- Savings and investment products have seen the largest declines with 2011 volumes 78% lower than 2007. The fact that this segment is the hardest hit is not surprising, as rising unemployment and austerity measures introduced in recent Government budgets have left people with less disposable income, while volatile investment performance has damaged consumer confidence, and
- Protection business is down almost one-third from 2007. By comparison to the other product types protection products have held up quite well. This is often the case in a downturn as people become fearful of their ability to pay bills if something unexpected happens.

5.1.2 Regulatory Changes

5.1.2.1 Fitness and Probity

Under the Central Bank Reform Act 2010, the Central Bank of Ireland (CBI) was empowered to define “Controlled Functions” within regulated entities. A position is deemed a “Controlled Function” when the function holder is:

- likely to have significant influence on the conduct of the insurance company,
- likely to be involved in monitoring and controlling the company’s compliance with regulatory obligations,
- involved in giving advice to customers, and
- likely to deal with the property of the customers.

Additionally there are controlled functions which have been defined as “Pre-Approved Controlled Functions”. CBI approval is required prior to filling these positions. These roles include CEO, Chief Actuary, Head of Investments, and other senior management positions within a (re)insurance company.

The CBI has set Standards to be met by those occupying any Controlled Functions as follows:

- they should be competent and capable of fulfilling the role,
- they should act honestly, ethically and with integrity, and
- they should be financially sound.

The Standards came into effect on a phased basis from 1st December 2011:

- From 1st December 2011 the Standards applied to new and existing Pre-Controlled Functions,
- From 1st March 2012 the Standards applied to new Controlled Functions, and
- From 1st December 2012 the Standards apply to all individuals occupying a Controlled Function.

Compliance with these Standards and the introduction of this new regime is likely to have caused significant additional work for life companies. Going forward, will this also impact on the recruitment process for life companies? This is an important consideration in particular for Pre-Approved Controlled Functions as written approval of any appointment must be received from the CBI before any offer can be made.

5.1.2.2 Corporate Governance Code

In 2010 the CBI issued the “Corporate Governance Code for Credit Institutions and Insurance Undertakings” which sets out minimum statutory requirements on how banks and insurance companies should organise the governance of their institutions. The Code aims to ensure that companies put in place appropriate governance structures and that there is sufficient oversight of the company’s functions.

The Code places the responsibility for corporate governance with the Boards of Directors and aims to ensure that no individual has inappropriate control or decision-making powers. The Code requires that Boards of major institutions must have a minimum of seven directors and all other institutions must have a minimum of five directors. A Major Institution is defined as any institution that has any or all of the following features:

- a significantly large presence in the local market, and/or
- carries on significant international activities outside the State, and/or
- is significant (including, but not limited to, by reference to size, substitutability, and reputation).

The Code also sets out:

- Requirements on the role and number of Independent Non-Executive Directors,
- Criteria for director independence and consideration of conflicts of interest,
- Limits on the number of directorships which directors may hold in financial and non-financial companies to ensure they can comply with the expected demands of board membership of a credit institution or insurance company,
- Clear separation of the roles of Chairman and CEO,
- A prohibition on an individual who has been a CEO, director or senior manager during the previous five years from becoming Chairman of that institution,
- A requirement that board membership is reviewed at a minimum every three years,

- A requirement that Boards set the risk appetite for the institution and monitor adherence to this on an on-going basis,
- Minimum requirements for Board committees including audit and risk committees, and
- A requirement for an annual confirmation of compliance to be submitted to the Central Bank.

The Code came into effect on 1st January 2011. Where institutions needed to change systems or structures, they were given until 30th June 2011 to comply with the Code. Institutions which needed to make changes to their Boards were required to be compliant with the Code by 31st December 2011. Companies that fail to comply with the Code could be subject to supervisory action and disciplinary procedures by the CBI.

So, while the Code itself has been in place for some time, on-going bedding down of the Code's requirements is still very much on the agenda for many insurers (e.g. annual review of Risk Appetite Statements as set out below.)

Risk Appetite Statements

One implication of the Code which has caused a significant amount of activity in life (re)insurance companies has been the requirement to establish a documented risk appetite. All institutions covered by the Code were required to have a board-approved Risk Appetite Statement in place by 30th June 2011. These statements are required to be reviewed by the Board annually. In December 2011, the CBI wrote to all (re)insurance undertakings to update them on the results of a review of Risk Appetite Statements by the CBI. Feedback from the review highlighted that risk appetite statements reviewed did not meet the required standard. The CBI suggested a number of areas where improvement was needed. Following the feedback from the CBI, it is likely that the first annual review of Risk Appetite Statements resulted in significant revisions in order to meet the required standard set by the CBI.

The Code is quite wide-ranging and is likely to have significant implications for life (re)insurance companies and raises some interesting questions. Does it put more pressure on Board members? Does it impact a company's "reaction time" or ability to operate day-to-day? Are life (re)insurance companies paying a penalty for the poor management of other financial institutions? Or should the Code be viewed as a positive step forward which will help build confidence in all financial institutions?

5.1.2.3 Consumer Protection Code

With effect from 1st January 2012, the CBI introduced a revised Consumer Protection Code which enhanced the protection provided under the Code issued in 2006. The new Code includes changes in a number of areas that are relevant to insurance companies:

- **Contact**
 - Unsolicited personal visits are banned.
- **Mis-selling of products**
 - Stricter requirements around the information which must be gathered under the “Know Your Customer” process,
 - Remuneration/commission structures should ensure that those involved in selling products can objectively assess the suitability of a product/service for consumers,
 - Those selling products have been provided with sufficient information and training to ensure that they can assess the suitability of a product for a consumer.
- **Vulnerable consumers**
 - Insurance companies must consider whether there is any evidence that a consumer is vulnerable (for example they may lack financial knowledge). The company must then provide these consumers with assistance to help overcome this vulnerability.
- **Transparency**
 - Balanced information should be provided in advertisements,
 - Key information on products and services must be prominent in advertisements.
- **Error resolution**
 - Errors must be fully resolved within 6 months. If an error is fully resolved within 40 business days there is no need to report it to the CBI, otherwise it must be reported,
 - All reasonable efforts must be taken to make refunds. Where this is not possible the company should not benefit.
- **Complaint handling**
 - A detailed log of all complaints should be kept,
 - Complaints must be acknowledged within 5 business days with updates provided at least every 20 business days,
 - If complaints are not resolved within 40 days, the consumer’s right to escalate it to the Ombudsman should be explained.

These changes will provide enhanced protection for consumers and ensure they are treated fairly. For life insurance companies this has required changes to systems and practices in order to comply with the Code. This has taken more resources both in terms of time spent and costs incurred; however, it should help to build confidence in the ability of life insurance companies to manage their businesses.

5.2 Growing Areas of Life Insurance

There are a number of insurance markets, outside of the traditional areas of insurance, where the expertise of those accustomed to the life insurance industry, in particular the skills and experience of actuaries, could be applied effectively. These markets are relatively small but are growing rapidly when compared to the traditional, mature markets that those working in the Irish insurance industry would be familiar with.

5.2.1 Micro-insurance

Micro-insurance is a form of basic low cost insurance aimed at low income customers in the developing world. It has been used as a protection against the risks associated with natural disasters. These products have evolved to fill a gap in the market that could not be filled by traditional insurance products. In recent years there has been considerable growth in Africa, Asia and, to a lesser extent, Latin America. A 2009 Lloyds report estimated that 135 million people were covered by micro-insurance policies with the market growing at a rate of 10% p.a. The same report estimated the potential market to be between 1.5 and 3 billion policies.

Life insurance companies have been attracted to the micro-insurance market for a number of reasons including potential profitability, access to new markets, brand awareness and corporate social responsibility. In some instances offering these products has been encouraged by local governments. Insurers face a number of challenges when trying to develop profitable micro-insurance products:

- Cost of reaching potential customers,
- Lack of trust of insurance companies,
- Lack of awareness of the benefits of insurance products,
- Poor infrastructure, and
- Lack of data.

To overcome these challenges insurers have partnered with local organisations to distribute these products. Additionally products have been designed with few, if any exclusions, and claims when they arise are paid without delay.

While micro-insurance has typically been focused in developing economies it is arguable that some of the principles could be applied in the Irish market. There have always been people without insurance coverage in Ireland. As a result of the economic downturn this is increasing as many people have had to cancel insurance policies as a result of no longer being able to afford them. Typically these are more vulnerable people without the resources to cope when the unexpected happens.

5.2.2 Takaful Insurance

Takaful insurance is an insurance concept which is consistent with the rules of Islamic Law. Traditional insurance is inconsistent with Islamic law because it contains elements of gambling, excessive uncertainty and interest on investment activities. Takaful is similar to mutual insurance insofar as the policyholders, rather than shareholders, benefit from any profits emerging. The Muslim community in Ireland has grown in recent years but is still relatively small, so the scope for such products may be limited. However, Takaful insurance may appeal to non-Muslims looking for ethical and/or cooperative insurance products.

The underlying principles of Takaful may be summarised as follows:

- Policyholders co-operate among themselves for their common good,
- Every policyholder pays a part of the contribution as a donation to help those that need assistance,
- Losses are divided and liabilities spread according to the community pooling system,
- Uncertainty is eliminated in respect of subscription and compensation, and
- It does not seek to derive advantage at the cost of others.

All policyholders agree to guarantee each other and they make contributions to a Takaful fund. The amount of an individual's contribution depends on their circumstances and the cover that they require.

The Takaful fund is managed by a Takaful operator who deducts charges to cover their costs. All claims are paid out of the fund and any surplus arising goes back to the policyholders in the form of dividends or reduced future premiums. The operating model for Takaful varies from country to country; however, the most widely used are Mudharaba and Wakala. Under the Mudharaba model shareholders (operator) share in the profit or loss with policyholders. Shareholders are paid a pre-agreed proportion of the surplus generated on the policyholders' fund and a pre-agreed proportion of the investment income on invested assets. Takaful investments avoid all interest-bearing financial instruments. In addition it also avoids any investment in other socially irresponsible sectors such as: gambling, alcohol, tobacco and weapons. In the Wakala model, the shareholders receive a pre-agreed proportion of the policyholder contributions in return for running the business on behalf of the policyholders. Under both models, if the policyholder fund makes a loss, the shareholder provides an interest free loan.

5.3 Corporate Activity

A lot of recent corporate activity has been as a result of the fallout from the financial crisis. An April 2012 article in the Financial Times predicted while there may be some small to medium sized transactions looming, larger transactions appear unlikely as the insurers brace themselves for the introduction of Solvency II. Below is a summary of some recent activity:

- In April 2011, Danske Bank said it would either sell or liquidate the Irish arm of its life insurance company Danica Life. Having failed to find a buyer a decision has been taken to liquidate the company,
- In April 2011, it was announced that Scor SE had agreed to buy Aegon NV's mortality risk reinsurance business, Transamerica Re for \$912.5m. This purchase meant Scor SE became the second largest life reinsurer in the United States,
- In June 2011, Alico UK announced that a number of its books of business were due to be reinsured and administered through an arrangement with Admin Re from 1st July 2011 ahead of a sale of these books to Admin Re's Windsor Life in 2012 (subject to FSA and Court approval),
- In March 2012, the Irish Government bought Irish Life for €1.3 billion from Irish Life & Pensions following the failure to find a buyer for the life insurance company, and
- In July 2012, it was announced that HSBC Insurance (Ireland) was to be sold to Bermuda-based Catalina Holdings. HSBC Insurance (Ireland) has been closed to new business since 2009.

Section 13 – Portfolio Transfers

There has been a lot of recent corporate activity in the form of Section 13 portfolio transfers. This covers the transfer of insurance portfolios within the European Economic Area. The process requires liaison with many stakeholder including policyholders, the CBI and the High Court. In addition there must be a report prepared by an Independent Actuary which covers, among other things, the impact of the transfer on the security of policyholder benefits and the expectation of benefits. The transfer must go before the High Court in 2 stages:

- **Initial/Directions Hearing:** The proposed transfer is presented to the Court and the Company commits to various undertakings required by the Court.
- **Second Hearing:** The Company confirms that it has complied with the undertakings required and the Court approves the transfer.

Where the transfer is cross border the home regulator of the transferee must also be involved.

SUMMARY

- ❖ Recent years have proven to be very challenging for life insurers in Ireland with significantly falls in new business volumes.
- ❖ At the same time there have been a number of regulatory changes domestically and in Europe. These changes have required time and resources to ensure that life (re)insurance companies were compliant.
- ❖ There is some growth in less traditional markets e.g. micro-insurance & Takaful insurance and areas where the skills of actuaries may prove beneficial.

5.4 Longevity & Mortality Update

This section provides a brief outline of the key findings from the most recently published longevity bulletin from the Institute and Faculty of Actuaries (May 2012). It includes a discussion on the recent trends in average life expectancy and variation in age at death across populations.

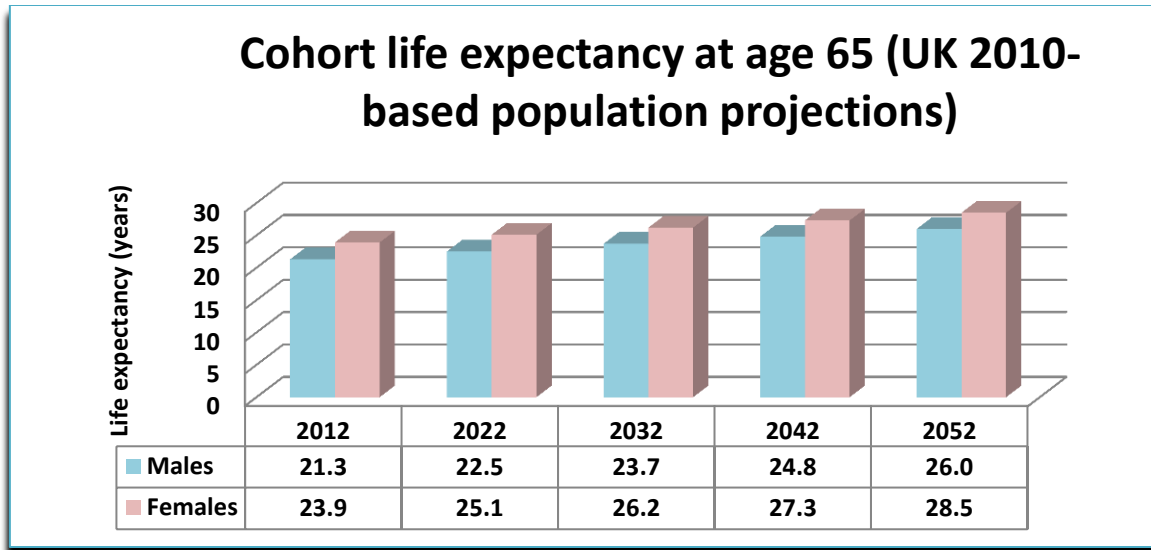
The results of the latest Eurostat Demography report split by country and gender will also be examined briefly. We will then discuss how Irish mortality trends for both males and females have compared with that of England and Wales over the 20th and 21st Century. The remainder of this section will consider less traditional methods of managing a life insurance company's longevity risk. In particular, we will examine the developing role of capital markets in providing longevity risk transfer solutions, and will look at a number of major longevity swap transactions that have been completed in the market recently.

5.4.1 Life Expectancy in the UK and Europe

Current demographic analysis show a pattern in most developed countries over recent history which reveals that people today are expected to live longer than ever. The Office for National Statistics has recently revised their national population projections to be more optimistic on life expectancy. The main driver of the increase in expected lifespans is the increase in the assumed long-term annual rate of mortality improvement from 1% to 1.2% (*ONS 2012a projections*).

This increase in mortality improvement rates has been justified not only by historic trends in population mortality, but also as a result of anticipated continued improvements in universal healthcare and advances in medical technology.

The graph below shows the impact of mortality improvements on the life expectancy of a 65-year-old today and in 10, 20, 30 and 40 years.



Source: Longevity Bulletin May 2012

Expressed in years, the table below illustrates the extent to which mortality improvements are anticipated to impact upon the total life expectation (from birth) for groups of lives (“cohorts”) born in 1981, 2010 and 2035.

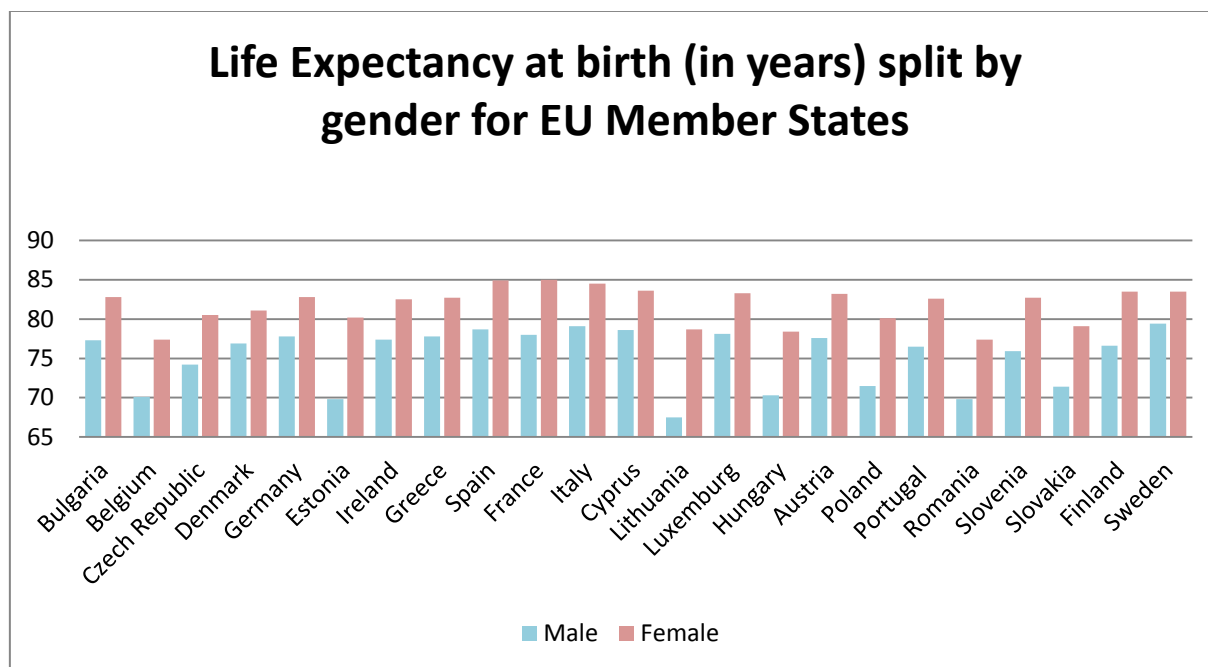
		Cohort Born 1981	Cohort Born 2010	Cohort Born 2035
At Birth	Male	84.7	90.2	94.2
	Female	89.1	93.7	97.2

Source: ONS Period and cohort expectation of life tables (2010-based) for United Kingdom, principal projection only. Based on historic mortality rates for 1981-2010 and thereafter assumed mortality rates consistent with 2010-based principal projection.

A recent report from the European Commission (White et al. 2011) showed marked differences in life expectancy for men compared to women across Europe. It is generally accepted that men on average have worse health, and thus mortality than women. This is not only because of biological factors but also because the typical male lifestyle is more detrimental to health as a result of a greater incidence of smoking, lower utilisation of health services and greater likelihood of accidental injury.

However, while women live longer than men on average in all EU-27 Member States, the difference between countries varies substantially. The gap between male and female life expectancy at birth ranges from 3.3 years in Iceland to 11.3 years in Latvia.

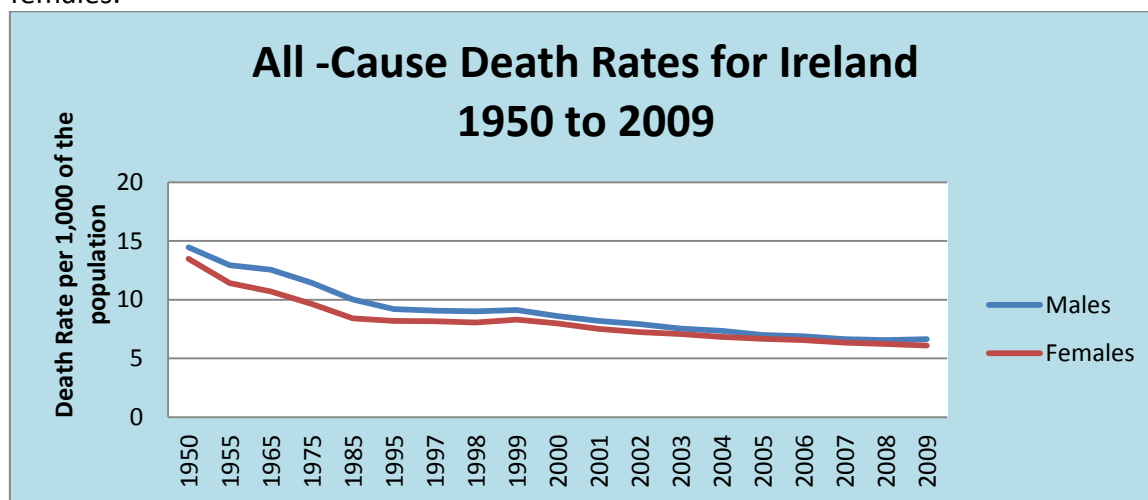
Although the difference in life expectancy for males and females has long been accepted and expected, the 2010 Eurostat demography report illustrated that the gender gap is reducing. The reduction in gender gap was largest in Luxembourg.



Source: Eurostat Demography Report 2010

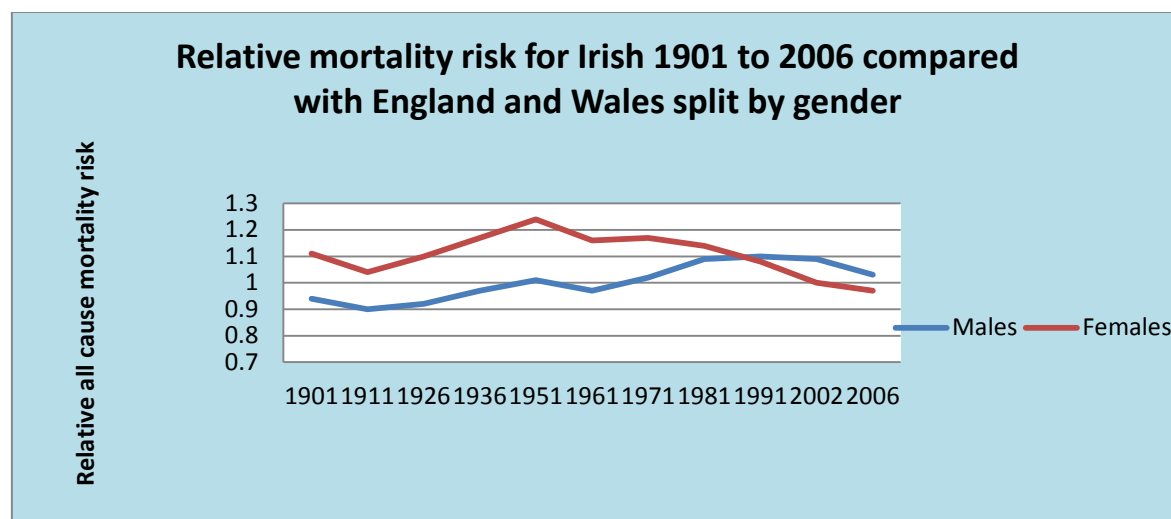
5.4.2 Irish Mortality

A study of Irish Mortality in the 20th and 21st Century carried out by the Society illustrated a significant decline in directly age-standardised all-cause death rates for Ireland from 1901 to 2006. The rates were adjusted to minimise the effects of differences in age composition when comparing rates for different populations (in this case they were standardised to the European Standard Population). The results showed a drop of 69% for males and 77% for females.



Source: Central Statistics Office Ireland

Compared with Northern Ireland, England and Wales, Irish male mortality (taking the age-standardised, all-cause measure as calculated above) gradually deteriorated throughout much of the 20th Century. However, it only became heavier than mortality in England, Northern Ireland and Wales in the second half of the 20th Century. On the other hand, female mortality using the same measure was heavier than that in England, Northern Ireland and Wales, improving as the 20th Century drew to a close as shown in the graph below.



Source: Human Mortality database (HMD). In the graphs above, relative mortality less than 1 indicates comparatively better mortality

Ireland experienced significant improvements in mortality in the early years of the 21st century. Irish mortality improvements at the start of the 21st century are mainly due to the drop in deaths from circulatory diseases (*Source: Emerging Trends in Mortality and Longevity Symposium 2011*) and it is likely that government policy has been partly responsible for this. Government policy is likely to have a significant impact on future mortality improvements. Having said that, between 2000 and 2009, public expenditure on healthcare increased from 5.5% to 8.5% of GDP (an increase of 54.5%). In addition, expenditure on pensions increased from 4.1% to 6.6% of GDP – an increase of 61%. **Source:** Eurostat Demography report 2010

It is debatable whether or not spending on healthcare is sufficient, or whether its use is efficient. However, it is noticeable that government expenditure on healthcare increased at a rate well in excess of economic growth over this period, suggesting that the government recognises its importance.

Government expenditure on healthcare is only one of many variables that lead to uncertainty in the future projection of mortality rates. Because of this uncertainty, it is important to consider a variety of projection methods, a range of projections rather than a point estimate

and regular reviews should also be carried out to ensure consistency with past data, international statistics etc. Actuaries must also take great care in using cause-of-death data as a basis for creating forecasts of future trends. Mortality by cause is strongly linked to socio-economic status which tends to differ between the insured and general population.

5.4.3 De-Risking Longevity

There are four basic management options for longevity risk. These are:

1. **Retain:** If the risk is retained, then there should be regular analysis and monitoring of the risk retained. Changes in longevity need to be monitored and reserves should be set prudently.
2. **Remove:** This involves reducing future exposure to risk. Examples include pension scheme redesign such as moving from Defined Benefit to Defined Contribution, removal of final salary link and also risk sharing with increased member contributions.
3. **Mitigate:** This entails reducing exposure e.g. via member options on a Defined Benefit pension scheme. An example of this is where the sponsoring employer of a defined benefit scheme offers members an incentive on top of the standard transfer amount to transfer their benefits into another scheme (usually of a Defined Contribution type). These incentives can include immediate, taxable cash payments which are referred to as Pension Increase Exchange (PIE) exercises. Members who accept the offer will be exposed to higher investment risk and to the risk of variable prices of annuities.
4. **Transfer:** The risk can be transferred to a 3rd party. For example, Enhanced Value transfers where the risk is transferred to members and bulk annuities where the risk is transferred to the insurance market. A further example we see in the market is life insurance companies with large block of annuities in payment using longevity hedging to transfer some of the risks to banks or reinsurers.

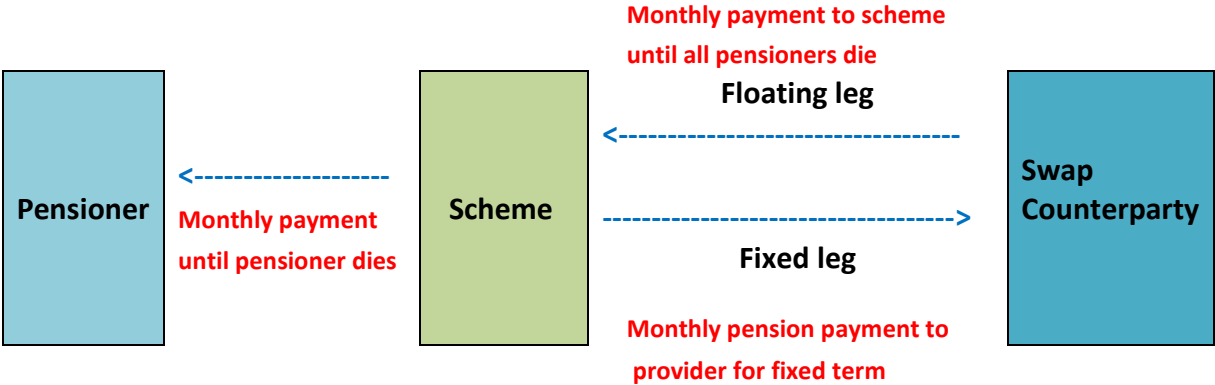
Regardless of the counterparty (bank, reinsurer, capital markets), there are two main types of longevity de-risking solution:

1. **Cashflow indemnity longevity swap:** These are typically used by larger pension plans to remove longevity risk in respect of their pensioner (in payment) population. They are usually structured as a contract of difference and the price reflects the complete risk transfer.
2. **Index based value longevity swap:** These can be used by smaller plans to hedge longevity trend risk. They are based on a population index and typically have shorter terms with a commutation payment. They are usually cheaper; however, fewer risks are transferred via this method.

Essentially, the difference between the two solutions is that in the first, the payments made to the cedant are based on the actual longevity experienced on the underlying book of

business. It is an exact hedge because it is tailored to reflect the actual longevity experience of the pension/annuitants. On the other hand, the index based longevity swap uses the longevity measured against an index – generally an index of population mortality. If life expectancy on the underlying book is longer than on the index, the second approach will leave the cedant in the position where the full risk has not been passed on (i.e. it is not an exact hedge like the 1st solution outlined above).

A typical cashflow indemnity longevity swap will be structured as a contract of difference. No up-front asset payment is made to the provider; instead the structure is a cash flow swap. The fixed leg consists of the expected benefits at outset plus a fee. The floating leg consists of the actual benefits, as shown below.



The type of swap chosen will depend partly on the organisation (e.g. pensions fund, sponsoring employer, insurers) and partly on the nature of the risk. An indemnity swap is probably better for hedging pension risk because it doesn't require the premium to be paid up front and therefore is particularly useful for pension schemes for which cash flow management is very important, as it allows them to transfer the risk without a large once-off capital outgo. On the other hand, an index swap is likely to be more appropriate and more cost-effective for hedging deferred risks because there is no requirement to provide data. However, it is not an exact hedge; significant residual (basis) risk remains.

There are a number of important points to consider when looking at longevity swap products from different providers. These include: term, strength of counterparty, collateral, flexibility, benefits covered and ability to move to buy-in (i.e. to purchase a bulk annuity contract which is held as an asset of the scheme for some or all of its members). Collateral assessment (evaluation of assets pledged to secure payment) at any point in time is a key area of consideration as there is potential for counterparty default exposure in either direction.

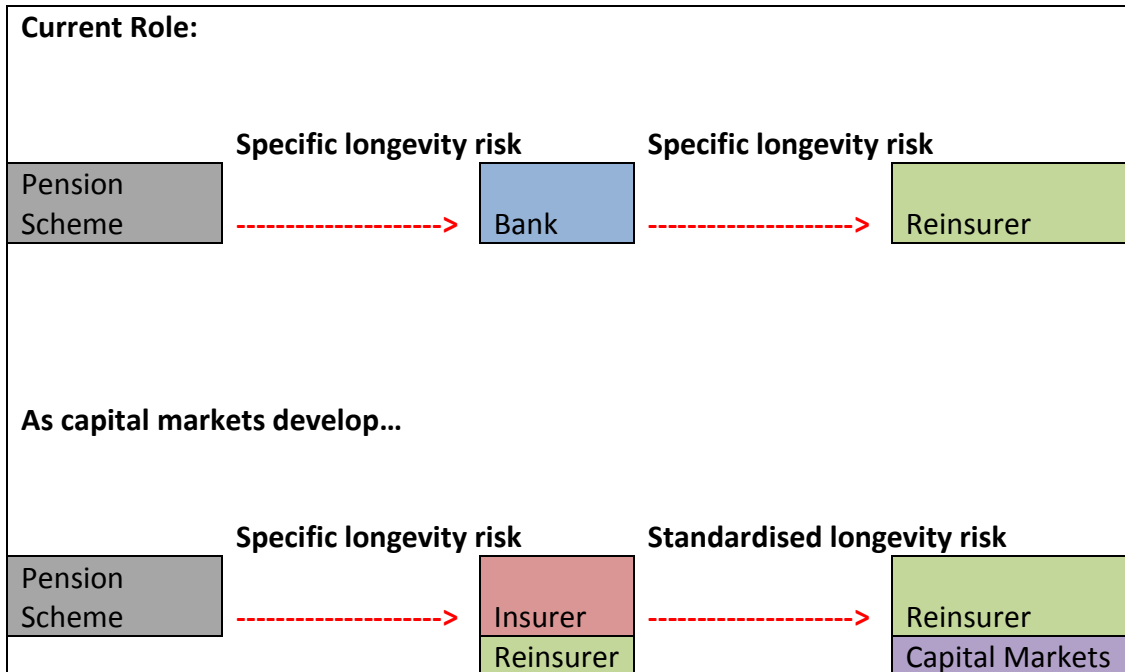
Before a scheme enters into a longevity swap contract, it must consider whether the price is right, whether the necessary data exists and whether the governance is too onerous.

The frequency and size of longevity swap transactions in the market has increased in recent years. In February 2010, BMW entered into a £3Bn pensioner bespoke indemnity longevity swap with Abbey Life/Deutsche Bank and in November 2011, Rolls-Royce entered into a £3Bn pensioner bespoke indemnity longevity swap also with Deutsche Bank. In the Rolls-Royce deal, significant asset de-risking was already in place and the trustee and sponsor were fully aligned in wishing to further de-risk. Security was a key consideration and so the swap was fully collateralised.

5.4.4 Role of Capital Markets

The current marketplace for longevity swaps (both indemnity and index) comprises a range of providers including banks, insurers and reinsurers. In these transactions, the longevity risk primarily ends up with a reinsurer. This occurs because reinsurers can take advantage of the benefits of diversification as a result of covering a wide range of non-correlated risks. Indeed, the reinsurers' risks would in many cases, be negatively correlated with longevity risk (primarily mortality). In addition, reinsurers can reduce basis risk through consolidation of many portfolios. Large diversified global reinsurers have significant expertise and a strong rationale to write and hold longevity risk. However there is a practical limit on capacity to take on longevity risk. As capacity gets utilised, prices increase and this results in reduced demand. Capital market investors may increasingly be attracted by the resultant higher returns.

At the moment, the capital market offerings include securitisation, derivatives and direct solutions. The capital markets can play a vital role in the provision of longevity risk transfer by providing additional capacity due to the increase in the number of end-holders of risk. The graph below shows the distribution of risk between the various parties involved.



There are usually more potential counterparties (i.e. not just insurers and reinsurers) and they adhere to the banking regulatory framework rather than to the insurance regulatory framework.

Despite the potential for increased longevity risk transfer provision by the capital markets, there are still challenges to be faced. One of the key challenges is to find an appropriate and universally accepted index as well as to create the liquidity necessary to facilitate secondary market trading. Some other benefits of a liquid market include increased hedging ability and security for pension funds as well as increased flexibility and capacity for insurers. This is the key to developing the market which would enable investment and other banks to contribute with their distribution capacity. The knowledge and readiness of banks and market-makers to trade is also a key consideration. Another challenge is to create a more efficient price discovery mechanism as hedgers need to consider how to price for each risk and how much capital to hold against each risk (e.g. asset, counterparty, inflation, basis and model risk etc.)

In addition to these challenges, the recent financial turmoil has reduced the risk appetite of some players and this has meant reduced capacity for asset-backed transactions. In addition, there are concerns around security and this increases the importance of structuring the swap transactions to ensure that the key features are appropriate to the fund's cashflows and potential termination events. Security features such as on-going verification of collateral are included in many transactions. Due to the increasing uncertainty surrounding future mortality improvements, pricing is likely to be less uniform across different portfolios in times to come and index hedges are likely to cease to be effective valuation hedges other

than for very large portfolios. This is because in the case of very large portfolios, the probability that actual mortality experience is closer to the expected experience (population index) is higher due to the law of large numbers and hence basis risk can be reduced significantly.

5.4.5 Alternative Methods

There are other various methods of transferring longevity risk available on the market. These are outlined below:

- **Longevity bonds:** These bonds pay declining coupons linked to the survivorship of a cohort of the population and continue to be paid until the maturity date of the bond. In the past, longevity bonds were more prevalent but these require up-front payments to purchase the bonds. The credit exposure to the bond issuer is significant and they have a large impact on the asset mix because it requires a large proportion of assets to be switched into the bond. They are also usually a low return investment.
- **Longevity derivatives:** An example is a typical longevity swap where the pension fund pays the provider the expected benefits plus a fee and in return receives the actual benefit payments from the provider. These are now more common and offer many advantages for longevity hedging. In particular, they have a minimal impact on the asset mix. The only impact on asset allocation is via constraints on the assets used as collateral. There typically is no up-front payment and credit exposure can be mitigated by collateral posting.

There are numerous types of longevity derivatives used to reduce or remove longevity risk. If there is a desire to reduce longevity risk and ultimately to move to buy-out, then traditional buy-ins (see below) may be used.

- **Traditional buy-in:** In this case a single premium is paid at inception. The DB pension scheme purchases a bulk annuity contract which is held as an asset of the scheme for some or all of its members. This secures future payment of selected scheme benefits for a selection of pensioners. If there is a desire to de-risk but there is a limited budget, then synthetic buy-ins (see below) may be used instead.
- **Synthetic buy-ins:** The premiums for synthetic buy-ins are based on the expected proceeds of a pre-agreed asset portfolio. It involves bringing together interest rate, inflation and longevity hedging to mimic a buy-in and may provide flexibility which is not available through a conventional annuity.
- **Deferred premium buy-ins:** Alternatively, deferred premium buy-ins may be considered where the premium is determined using a pre-agreed premium schedule. Under this structure, the trustees have immediately insured the key risks associated with paying the pensions but payment of the premium is deferred.

With all of the above longevity risk transfer solutions, significant counterparty default risk is retained. Counterparty default can be mitigated by collateral and other security provisions. For example, in a buy-out transaction for DB pension schemes, all the liabilities are transferred to an insurance company with limited risk remaining with the fund.

Another method of managing longevity risk is to offset some of the risk by increasing exposure to mortality risk. For example, some insurers may write life insurance business to provide diversification with an uncorrelated risk or perhaps even as a hedge for annuity business written. However life insurance tends to be sold to younger people so the population is likely to be very different when compared to annuitants. As a result, this will be an imperfect hedge, but there should be sufficient negative correlation for the offset to be significant.

SUMMARY

- ❖ Current demographic analysis show a pattern in most developed countries which reveals that people today are expected to live longer than ever.
- ❖ There are marked differences in life expectancy for men compared to women across Europe.
- ❖ Ireland experienced significant improvements in mortality relative to Northern Ireland, England and Wales in the early years of the 21st century.
- ❖ There are four basic management options for longevity risk; retain, remove, mitigate or transfer.
- ❖ Despite the potential for increased longevity risk transfer provision by the capital markets, there are still challenges to be faced.

5.5 Sovereign Annuities

5.5.1 Background

Over the past decade, defined benefit pensions schemes have encountered the perfect storm of economic, demographic and regulatory problems. Average life expectancy is higher, interest rates are lower, investment returns are down and the recent introduction of a risk reserve have all placed massive strain on them and threatened their long-term viability.

Falling interest rates and higher life expectancy have driven up annuity prices by more than 50% in the last 10 years. Traditional annuities are normally priced with reference to AAA government bond. A lower interest rate environment and a flight to quality during the Eurozone crisis have driven down yields on these bonds, hence increasing the cost of these annuities. This has had a knock on effect on pension schemes as their pensioner liabilities must be valued using the cost of these annuities.

As part of recent changes to the funding standard, defined benefit schemes will be required to hold an additional risk reserve from 2016. This will be equal to 15% of asset holdings other than bonds or cash plus the net effect on assets and liabilities of a reduction in interest rates of 0.5%.

The asset side of the scheme balance sheet has also suffered over the last number of years. According to Rubicon Investment Consulting, the annual average investment returns over the last 5 years has been -2.1%.

The combination of all these has led to a situation where approximately 80% of defined benefit schemes do not meet the recently reintroduced minimum funding standard. . In addition, under existing wind-up rules, pensioner benefits take priority over benefits for active and deferred members in the case where the scheme does not have enough assets to pay all benefits.

Sovereign annuities were the joint proposal of the Irish Association of Pension Funds (IAPF) and the Society of Actuaries in Ireland (SAI) to try to address some of these issues. Its aim was to reduce the deficit in defined benefit pension schemes by allowing them to use the yield on riskier sovereign bonds to value their liabilities.

5.5.2 Detailed description

The key difference between a conventional annuity and a sovereign annuity is that the credit risk of the underlying bonds backing the annuity is passed to the scheme/member in the case of sovereign annuities. This means that the payment of the sovereign annuity is linked directly to the payments made by specified bonds. In the event of “non-performance” payments to the annuitants can be reduced. In the case of a conventional annuity, the annuitant is relying on the continuing solvency of the life company. For a sovereign annuity, it is the ability of the EU governments referenced in the policy conditions to meet their coupon and capital bond repayments that will be an additional concern the annuitant, over

and above any concerns about the solvency of the life insurance company who sold the sovereign annuity.

5.5.2.1 Reference bonds

In theory, Sovereign annuities can only be referenced to bonds issued by either Ireland and/or another Member State of the European Union. In practice, they need to be linked to riskier countries in order to take advantage of their higher yields. Linking a sovereign annuity to Germany would give essentially the same price to that of a conventional annuity.

A sovereign annuity can be referenced to either a single bond or more than one bond so long as each bond is issued by Ireland or another Member State of the European Union. Details of the specific bond(s) must be set out in the policy. Where there is more than one reference bond the percentage of the payments referenced to each bond must be set out in the policy. In the event of non-performance of a particular bond, the pension can only be reduced up to a maximum of the percentage to which the bond is referenced.

The contract can be designed in such a way that part of the sovereign annuity cannot be reduced. Where the percentage that can be reduced is less than 100% the balance payable would not be capable of reduction and would be similar to a traditional annuity. The same will apply to the full annuity payment after maturity of the last reference bond.

5.5.2.2 What happens in the event of default?

An event of “non-performance” is essentially a default and is defined as where either:

- the payments due under a reference bond (capital and/or coupon/interest) are not paid on the due date, or
- the terms of a reference bond are varied such that in the opinion of the insurer issuing the policy, the value of the payments due under the reference bond (capital and/or coupon/interest) would be less in value than those due prior to the variation

Events such as the following do not amount to an event of non-performance:

- the issuer of the bond declaring an intention not to make payments due under a bond or an intention to vary its terms,
- maturity of the bond, or
- early redemption of the bond in accordance with its terms do not amount to an event of non-performance.

Once an event of non-performance has occurred, the life company must notify the annuitant within one month and explain the potential impact on payments. The life company cannot make a reduction to payments until at least three months have passed.

The life insurance company can adopt one of two approaches when calculating the reduction. The insurer can first determine the reduction in value of the payments due under the sovereign annuity due to the event of non-performance. The interest rate to be used for

this purpose must be set out in the policy conditions. Then, using the same interest rate, that reduction in value must be converted into a reduction in the payments due under the sovereign annuity (subject to a maximum of the percentage of the payments referenced to that bond and set out in the policy conditions). The reduction in payments can be applied in two different ways:

1. the reduction can be applied immediately to the reference percentage of the payments due under the policy until the reduction in value is taken account of, or
2. alternatively, the reduction can be spread forward over all future payments due under the sovereign annuity in which case the longevity assumption set out in the policy must be used to calculate the reduction in payments.

The individual policy must state which of the methods of reducing the payments apply to the sovereign annuity contract.

In practice, the life insurance companies seem to be adopting a simplified cashflow matching approach. If they don't receive an expected payment from one of the reference bonds, they don't pay that proportion of the annuity to the sovereign annuity policyholder.

The life insurance company must continue to monitor the reference bonds after an event or non-performance to check if an "event of recovery" occurs. This could be a restoration of coupons or perhaps an additional payment to bond holders to settle litigation. The insurer must make payments under the sovereign annuity to take full account of the event of recovery. The manner of calculating and applying the restoration must be consistent with the manner in which payments were reduced as a result of the event of non-performance.

In the normal course of events, the list of referenced bonds cannot be changed. However, if in the event of non-performance some type of replacement bond is issued, the Pensions Board is willing to consider proposals from insurers to take account of such replacements.

5.5.2.3 Who can buy them?

Sovereign annuities can only be purchased by the trustees of an occupational pension scheme in respect of a person who is receiving benefits under the scheme or has reached normal pensionable age. They cannot be used for any other scheme liabilities and cannot be bought with the proceeds of a personal pension or individual PRSA.

The sovereign annuity can be owned by either the trustee or the member. In the case of a *buy-in*, the scheme purchases the sovereign annuities from the life company. These are then held as an investment, the proceeds of which are used to pay the members' benefits. The relationship between the scheme and the member does not change. In the event of non-performance, the scheme may receive a lower payment from the life insurance company but is still obligated to pay the pensioners in full. As is the case with any investment, a failure by the scheme to receive what they expect from the sovereign annuity could further weaken the funding position of the scheme. As pensioners in payment get first priority, active and deferred members could see their benefits reduced.

Where a *buy-out* occurs, the scheme buys sovereign annuities on behalf of the members. The scheme has discharged their liability in full and the relationship is now between the member and the life insurance company. In the event of non-performance the life company may suspend or reduce the payments to the member. Either way the trustees are making an investment decision either for the member directly or on behalf of the scheme.

5.5.3 Risks

The *credit risk* of the underlying bonds has been transferred from the insurance company to the scheme/member. If the sovereign annuity is designed such that 100% of payments are referenced and there is a total default on those bonds then payments can be reduced to zero. Pensioners could receive no income for a period of months or years. This is a fundamental shift away from the traditional annuity concept where an income is guaranteed for life.

As is the case with normal annuities, the life company is still exposed to fluctuations in the value of the bonds, even where a fall in the value of the bonds is driven by concerns around the creditworthiness of the issuer. For example, in July 2011 the yields on 10 year Irish bonds rose to 14% but since there was no event of non-performance the payments under a sovereign annuity would not have been reduced.

Life companies will face severe *reputational risk* if they have to reduce payments to annuitants or if schemes are forced to wind-up due to a reduction in payments they receive under their sovereign annuity investments. This may be mitigated somewhat if only Irish bonds were referenced - in the event of default it would be a major domestic news item. Pensioners/schemes may also feel that they will have more of an influence on the outcome of an Irish default relative to a default in another country. There is also the possibility that in the event of default, the Irish Government could treat the bonds used to back sovereign annuities more favourably to protect pensioners.

Because of the risks outlined above, trustees will need detailed legal, actuarial and investment advice before proceeding with either a buy-in or a buy-out. If Sovereign Annuities are used by trustees, the nature of the scheme's promise to bought-out members will have changed and may be open to legal challenge as the income is no longer guaranteed for life. The trustees' intention may be to improve the funding position of the scheme through the use of sovereign annuities thereby leaving members, and particularly deferred/actives, in a better position.

If a scheme chooses the buy-in approach it may be extremely difficult to unwind this investment at a later date due to its illiquid nature. They would have to negotiate with the life company and should they get agreement to the un-wind, would also need to factor in the value of the underlying bonds at the point of surrender.

The sovereign annuity framework allows bonds from any EU Member State to be referenced

but linking to bonds issued outside of the Eurozone introduces an additional currency risk. For this reason and the need to get a yield uplift, it is expected that the majority of sovereign annuities will only use Irish government bonds as reference bonds. This may lead to an increased concentration of risk in Ireland. Using a country such as Greece would also avoid currency risk and give a yield uplift, but the risk of default would most likely be too great for these bonds to be used.

The name “sovereign” annuity is also problematic as it implies a more secure annuity while in reality the opposite is true. While a sovereign annuity referencing German bonds is likely to be as secure as a traditional annuity, sovereign annuities referencing most of the other EU member states will be less secure.

Life insurance companies will need to closely match the income from the reference bonds to the payments under the sovereign. While any bond issued by an EU member state can be used, bonds with large capital redemption payments at maturity may not be suitable. This is because the life insurance company will be making annuity payments based on the promise of receiving future bond payments. At that point in the future should the bond payments not materialise then it may not be possible to reduce annuity payments to fully reflect the loss to the life insurance company.

5.5.4 Regulatory Framework

Legislation facilitating the introduction of sovereign annuities was passed by the Oireachtas in 2011 (The Social Welfare and Pensions Act 2011). This allowed pension schemes to purchase sovereign annuities.

Before they can be sold, the Pensions Board must certify that a sovereign annuity meets its requirements and those of Section 53B of the Pensions Act, 1990. Only companies who are undertakings within the definition of the Insurance Act 1989 are eligible to apply.

The Pensions Board will maintain a publicly available register of all specimen policies which it has certified. At the time of writing in September 2012 Zurich was the only company to have completed the certification process. The Pensions Board will also maintain an up to date database of information relating to such specimen policies.

5.5.5 New amortising bonds

One of the key issues for life companies selling sovereign annuities is the selection of the reference bonds. The problem with traditional coupon plus capital repayment bonds is that the life insurance company is overly exposed to default, particularly approaching the capital repayment. After discussions with industry, the NTMA proposed to issue amortising bonds specifically to meet the demand from life companies and pension schemes.

The NTMA has several conflicting objectives in issuing these bonds. From a political point of view and to help maintain investor confidence around the perceived riskiness of Irish debt,

Ireland would not want to be seen to issue debt at too high a yield. A yield of around 6% seems to be the point at which investors and commentators believe the debt becomes unsustainable in the long term. Ireland can also access funding from the Troika at lower yields, so there is no immediate need to issue debt at that level. At the same time, the NTMA was keen to support the Government's pension policy and also to diversify sources of funding, in particular to become more attractive to pension schemes and life insurance companies. These new bonds have a very different structure to the existing Irish Government Bonds available to purchase in the secondary market:

- **term** – the longest dated amortising bond matures in 2047 while the shortest matures in 2027 compared to 2025 for the longest dated of the existing bonds
- **cashflows** – the amortising bonds are structured such that they make equal annual payments over their lifetime with no capital redemption at maturity, the existing bonds pay annual coupons at around 5% plus a repayment of the capital at maturity
- **method of sale** – the existing bonds were issued via auction with the level of demand from investors determining the yield, the initial tranche of the new amortising bonds were issued by way of tap with the NTMA setting the yield and buyers indicating how much they wish to purchase at that yield. It is unclear whether they will continue to be issued via auction or the tap method
- **liquidity** – it is expected that the new bonds will be much less liquid as schemes and that life companies will hold the bonds to maturity, their issue size is substantially smaller than any of the existing debt where the smallest existing issue is approximately €4 billion

On the 23 August 2012 the NTMA issued over €1billion of these amortising bonds at the following yields:

Term	Date of Maturity	Amount Sold € m	Yield
15	July 2027	35	5.72%
20	March 2032	34	5.82%
25	January 2037	298	5.92%
30	May 2042	323	5.92%
35	September 2047	331	5.92%

On the same day the yield for the Irish 2025 bond was 6% suggesting that the demand for the unique cashflow profile more than outweighed any perceived liquidity problems. This allowed the NTMA to issue the bonds at below market yields.

SUMMARY

- ❖ Long term viability of many defined benefit schemes is under threat.
- ❖ Sovereign annuities shift credit risk of the underlying bonds from the life insurance company to the pension scheme/annuitant.
- ❖ In the event of default, payments under the sovereign annuity may be reduced, potentially to zero in the event of a total default.
- ❖ NTMA have issued new amortising bonds to meet the demand from industry for bonds whose cashflow profile will better match that of the annuities.

6 General Insurance

6.1 Market Update

6.1.1 Motor Insurance

The Injuries Board was established under the Personal Injuries Assessment Board Act in 2003 and is a statutory body which provides independent assessment of the compensation due for personal injury claims. The main aims of the Injuries Board are to allow claims to be settled quickly and efficiently and to reduce the legal costs associated with finalising claims in the court system.

In recent years, the Injuries Board has had a positive effect on the compensation culture in Ireland. Two-thirds of Motor claims are now settled through the Board rather than in court, resulting in savings of between €40m and €50m each year.

The economic recession has not brought about the anticipated spike in Motor claims costs, largely thanks to the efforts of bodies such as the HSE, the Irish Insurance Federation (IIF) and the Road Safety Authority (RSA). Improved education of the general public and very significant infrastructure spend, coupled with significantly increased enforcement measures, have reduced road deaths materially. Three out of four injury claims are still, however, motor-related. Most insurers have detected an increase (of up to 10%) in the incidence of fraudulent Motor claims over the past two years.

The Motor insurance market has softened considerably over the past number of years, and this is likely to have been due in part to the increased price-sensitivity of customers in a recessionary environment, in parallel with the normal activity of the insurance cycle. Most insurers, however, expect to see pressure on rates returning, impacted by increasing injury frequency reported widely in the press. There will also be increased uncertainty brought about by the implementation of the Gender Directive amendment on 21 December 2012, and this may also exert some additional pressure on rates.

It is interesting to note that frequencies have increased on recent accident years in Northern Ireland due to the impact of “claims farming”, whereby claims management companies aggressively pursue even relatively minor claims, often on a “no-win-no-fee” basis. This mirrors the last few years of similar experience from the rest of the UK where the number of injuries per accident rose from 1.4 to 1.6 nation-wide, but in certain regions were as high as 2.0.

As at year-end 2011, the market average Motor operating ratio in the Republic of Ireland was approximately 98%. Projected experience for the 2012 accident year is, however, still highly uncertain as a result of the above influences.

6.1.2 Liability Insurance

Since 2008, some insurers have seen a decline in gross earned premium due to a gradual shift away from the insurance of construction-related risks to the insurance of “white collar” risks. These latter risks tend to have lower premium rates. Similarly, some insurers have witnessed a decline in average costs per claim in recent years – possibly due to the pursuit of lower-value claims which would not have been as prevalent prior to the recession. However, this is also manifesting itself in significant increases in claims frequency in both PL and EL, as reported recently by the Injuries Board.

Due to the uncertainty that is inherent in long-tailed Liability claims and the large impact of case reserving strength on ultimate loss estimates, it is very difficult to make any assertions about market-wide trends in Liability classes of business. This is particularly true for the more recent accident years. It is clear, however, that the recession is exerting its “text-book” upwards pressures on claims frequencies.

6.2 Telematics

6.2.1 Introduction

The basis of insurance pricing has been the identification and measurement of significant risk characteristics and using these characteristics to differentiate in terms of price. The insurer who can most accurately predict the expected claims cost of the business being written possesses a competitive advantage in both pricing and, indeed, risk selection.

For car insurance, for example, the expected risk profile of potential customers has traditionally been quantified using proxies such as age, location, car engine size and of course gender in a complex mathematical model such as a Generalised Linear Model. If sufficient data is utilised in the model and the model is well built it should be predictive of future behaviour “on average”.

Models such as these have been the cornerstone of personal lines pricing for many years and it is widely accepted by the industry that they are an effective means of minimising cross subsidies and anti-selection.

“Telematics” is a concept which has been promising to move general insurance pricing away from the idea of fair price for a given cohort to a fair price for each individual. The momentum behind telematics has been minimal to date (but there has been a surge in interest in recent times for various reasons). Among these are the low margins being generated by traditional insurance policies in the UK due to increasing competition, the position in the underwriting cycle and the prevalence of aggregator websites. In addition, and possibly more significant from an Irish point of view, the ECJ ruling on gender has been somewhat of a catalyst. This ruling has inhibited insurer’s ability to even charge the price that is fair on average so insurers are beginning to explore alternatives.

6.2.2 Explanation of Telematics and Usage-Based Insurance

Usage-based insurance is defined as “a rating structure that is based, in whole or in part, on the electronic accumulation of data, through a device installed in a motor vehicle, in which an individual’s daily driving-habits are used to determine a premium rate”.

The types of data collected include location, time of day, type of roads, speed, acceleration, sharpness of braking, time on the road and distances travelled. By gathering this information insurers can attempt to quantify the risk posed by customers and amend their insurance premium appropriately to reflect this.

The technology in telematics has developed significantly since its introduction. These developments have primarily served to reduce the cost of provision and make telematics more accessible to the masses, rather than there being any dramatic changes in functionality or types of data gathered.

The earliest form of telematics technology and the type which is used widely in the motor fleet industry is a professionally installed hard-wired “black box” solution. These black boxes are installed in the car and can transmit the some or all of the data described above the insurer, enabling them to set or amend insurance premiums based on the information received. In the early days of usage-based insurance the cost of installation and purchase of these boxes proved to be quite prohibitive. However, this type of technology has become a lot cheaper over the last few years. However, there is no industry standard for these devices which can increase costs for insurers if they want to be compatible with a variety of designs.

The cost of transferring the box between vehicles for customers or changing devices when moving insurer can often be a deterrent also. Given the challenges outlined above, it is no surprise that recent developments in telematics have seen a shift to the use of self-install devices. These devices are generally provided by the insurer and are connected to the On Board Diagnostics port (EOBD in Europe or OBD-II in US) in the car. All petrol cars registered since 2001 and all diesel cars registered since 2004 have these ports in their cars. Self-install devices are cheaper and more easily transferrable than their black box counterparts and therefore provide a more sustainable way of implementing a usage-based insurance offering.

Smartphones are at the forefront of most modern technological developments. Telematics is no different. Smartphones can replace traditional telematics devices by providing all the functionality that is required for usage-based insurance, via a device which most customers will already possess. Some insurers are already piloting this approach. However, it is in infancy and there are still potential issues associated with it. These include:

- Potential signal difficulties, and
- Possibility of customer forgetting phone or choosing to turn phone off to avoid detection of poor driving.

Phone is not usable for theft tracking as the customer may not leave their phone in the car when they have left it. The method by which data is transferred to an insurer for analysis can vary. Some devices will transfer data in real time. These devices can often provide real-time guidance to users to ensure that their driving remains safer (and ultimately cheaper). For other devices users need to manually upload their data periodically to a central on-line site.

The amount of data currently used to price policies also varies significantly between insurers. Some insurers simply give discounts if users drive below certain mileage or drive outside certain times of the day. At the opposite end of the spectrum, the possibility exists to analyse a wide array of behavioural factors. As telematics develops in the insurance industry and competition increases, the range of data collected is sure to increase dramatically as insurers try to improve their pricing sophistication. This is analogous to the currently on-going search for predictive rating factors by insurers.

Of course, in the event of an accident significant data will be generated, which can be used to assess the merits of the claim and can also feed back into the future pricing of the policy.

The way in which “pay-as-you-drive” insurance is priced can vary also from simple usage or mileage discounts to sophisticated algorithms based on the data capture described above and which could allow the policyholder’s insurance price to vary regularly.

6.2.3 Advantages of usage-based insurance

Enhance Pricing Accuracy

In a world of gender-neutral prices, it will be impossible to avoid having cross subsidies in motor insurance prices as long as prices are derived with reference to proxies for driving ability. The use of telematics and usage-based pricing can overcome at least some of these problems and ensure a fairer price for all customers. If certain insurers make this quantum leap first they may have an opportunity to significantly improve their market share.

Improved Customer Base

Usage-based insurance will be voluntary for the foreseeable future. It is likely that the types of customers who opt for a telematics based policy will be those who anticipate saving money as a result of taking out the policy. They will typically be low-risk customers who have no qualms about having their driving ability scrutinised. This will result in a low expected claims cost for these customers. However, it may be possible to still obtain profit from these customers if their profit-loaded premium is more competitive than non-telematics quotes available in the market.

In fact, the risk influence goes a step further in that the mere fact of having a telematics insurance policy may actively improve the risk profile of the policy holder. They may drive less, or more carefully, in the knowledge that it saves them money and may concentrate more behind the wheel.

Claims Benefits

Telematics can also be used effectively in the claims settlement process. Data can be used to gain a full understanding of the cause of the claim and enable the insurer to gauge whether the insured persons are responsible or not. This should save on claims assessor costs. It can also be an effective tool in deterring claims fraud. For instance, it could be shown that particular whiplash claims from third parties are fraudulent by demonstrating that the collision was at a slow pace. Claims leakage is a major issue for insurers with fraud being of particular worry in the current economic climate. In fact fraud has been the main driver of telematics developments in Italy, a country which has traditionally struggled to combat the effects of fraud in insurance.

Customer Relationship

A telematics policy is more transparent to customers. Insurers are frequently inundated with complaints from claims-free customers whose prices rise year-on-year to allow for increasing trends in motor injury costs for example. In a sense, usage-based insurance charges customers in the manner that many believe they should be charged. Increases or decreases in price can be tied back to the specific driving behaviour of the customer for which the data is readily available. The “feel fair” factor of telematics could be a generator of significant loyalty among customers which can only benefit insurers in the long term.

Societal Benefits

As mentioned above telematics can result in improved driving behaviour and reduce the expected claims cost to insurers. The benefits of this extend far beyond the profit and loss account of the telematics insurer. The increase in safety and driver awareness is a benefit for society as a whole.

Competitive Advantage

The competitive advantages of telematics are applicable for insurers who move first and successfully implement a telematics solution before it becomes more prevalent. Early movers should be able to pick off the customers whose driving ability and behaviour are atypical of what is expected based on their respective risk details. E.g. the risk averse and safe young males or the middle-aged business men who only drive their car to the shops at weekends!! It is worth noting that this advantage only exists if the data being captured by insurers is of high enough quality and their pricing model is sufficiently robust to accurately price these usage-based policies.

Additional Services

There are often additional services associated with telematics over and above those related to insurance. These can increase the propensity of customers to avail of the service. These include:

- **Real-Time Driver Coaching** – Where the device provides guidance to the user regarding potential hazards, speed restrictions and traffic updates.
- **Vehicle Theft Tracking** – Allowing customers or the police to locate their vehicle in the event of it being stolen.
- **Emergency Services** – There can be automated messages sent to the emergency services in the event of collisions.
- **Roadside Assistance** – This is similar to the point above but applies to breakdowns rather than collisions.

6.2.4 Disadvantages of Usage-Based Insurance

Big Brother

Many opponents will question if the use of telematics impinges upon the privacy of drivers. Customers may be hesitant about insurers tracking their every move and potentially amending their insurance price based on this. They may also be wary of the potential for data on poor driver behaviour to be shared with Gardaí.

Cost to insurers

The introduction of a usage-based insurance system brings with it start-up costs for an insurer. This includes setting up the IT capability to handle large volumes of data. Of course there would need to be investment in every other area of the business to adapt to the different nuances of telematics. Pricing departments will need to be equipped to analyse and use the new data; reporting will be different as the make-up of the data will be so different to traditional insurance data. Claims departments will probably play a more active role in the on-going monitoring of business written, as actual claims will no longer be the only alarm bell to indicate that a given policyholder may be risky. In a sense it is this shift away from the traditional approach to motor insurance pricing which will bring with it significant costs. Arguably, the cost factor points to telematics being a potential niche for new start-ups who can develop their infrastructure with telematics in mind rather than having to adapt existing practices.

Accuracy of data

In the same way as traditional insurance pricing, the need for good quality data is paramount in accurately rating a telematics policy. For instance, if information on the type of roads and time of day that driving is done is not available the prices charged will not be as accurate.

Dual maintenance of rating

This point has already been alluded to under cost. For a traditional insurer to introduce telematics there will be significant overheads as the maintenance of telematics will have few synergies with the maintenance of traditional rates.

6.2.5 Use of Telematics Today

The US is probably the most advanced region in terms of use of telematics in insurance. The self-install On Board Diagnostic (OBD) devices discussed above are used widely. Progressive Insurance was an early player in the usage-based insurance space and they currently offer a product called “Snapshot”, which connects to the OBD port and offers a customised insurance price based on how, how often and when a car is driven. It is available in 39 of 50 states in the US.

Europe is an emerging market for usage-based insurance. However, as already mentioned the Gender Directive could accelerate this development. Norwich Union was the first insurer

to enter the UK market in 2004 with their Black Box solution. Norwich Union claimed its solution resulted in a 90% retention rate and 30% better claims experience than average, but they subsequently had to withdraw the offering citing the difficulties and cost challenges of a Black Box solution as discussed above. Aviva (previously Norwich Union) has now re-entered the market with a pilot Smartphone-based pay-as-you-drive app. This app monitors customers' driving for 200 miles, and those drivers whose risk profiles (determined based on acceleration, braking and cornering) are positive receive discounts. The re-emergence of Aviva in this market, with a Smartphone-based offering suggests that there is a clear movement in the direction of usage-based insurance as a viable alternative to traditional motor insurance policies.

6.2.6 Conclusion - Prospects for Ireland

There is a growing belief that telematics has a strong role to play in the insurance landscape in the future. Although Ireland has not really taken to usage-based insurance yet, there is no reason to assume that this development is not around the corner. In the past, Ireland has more often than not followed the UK in terms of pricing sophistication, e.g. with regard to the use of GLMs or Price Optimisation and, it is possible that telematics will be the next major development.

It could be argued that given aggregators became a major feature in UK insurance but did not become a feature in Ireland, telematics may not take-off in Ireland. However, once any initial teething problems are resolved, it is likely that telematics would provide a net benefit to the Irish insurance industry.

The first sign of usage-based insurance on the island of Ireland came with the launch of a Smartphone application (app) by brokers Autoline insurance in Northern Ireland. This app has been aimed at young drivers and offers an initial 40%-50% discount based on driver behaviour. This early movement, albeit in the North of Ireland could be seen as a taster of things to come in the telematics space for the Irish insurance market, particularly following the introduction of gender-neutral pricing in December.

SUMMARY

- ❖ The use of Telematics provides an exciting alternative to traditional methods of pricing motor insurance policies. By gathering data on actual driver behaviour, via devices installed or contained in the insured's vehicle, an accurate price can be determined without the need to use typical proxies such as age, gender, area etc.
- ❖ Telematics technology has developed significantly in recent years and focussed on improving the ease and reducing the cost of installing and transferring the devices.
- ❖ Telematics may have the potential to overcome the challenges associated with gender neutral pricing.
- ❖ There has been a marked growth in the presence of telematics in the UK insurance landscape and there is every possibility that Ireland will follow our near neighbours in embracing telematics in the near future.

6.3 Periodic Payment Orders (PPOs)

6.3.1 Introduction

This section describes the current lump sum approach to compensation for victims of accidents or medical negligence in Ireland and considers the periodic payment approach which has been proposed. A summary of the impact of moving from the lump sum approach to the periodic payment approach on insurers is also considered.

6.3.2 Lump Sum Approach

At present in Ireland insured lives who are victims of accidents or medical negligence are compensated through a single lump sum award. In cases where the injured person has been catastrophically incapacitated either in the long-term or permanently or will require ongoing care and medical treatment in the future, the lump sum payment is calculated by considering the following:

- The insured's life expectancy and the extent to which it has been reduced as a result of the injury,
- The future cost of care and treatment of the plaintiff,
- The insured's loss of earnings arising from the injury, and
- A discount rate based on the investment return that may be achieved on the lump sum.

These factors will be determined based upon medical, actuarial, economic and financial evidence.

6.3.2.1 Advantages and Disadvantages of the Lump Sum Approach

Overall the disadvantages of the lump sum approach appear to significantly outweigh any advantages:

- The main disadvantage of the lump sum approach is that the insured may live longer than their projected life expectancy. As a result, they may not have the means to pay for their care in later years, as the lump sum awarded will have proved inadequate. The lump sum approach is a full and final settlement so the insured who exhausts their fund has no recourse to the insurer.
- It is worth noting that in cases where the insured has exhausted their lump sum the Irish State has to fund the costs of care and treatment for the plaintiff.
- The actual investment return achieved on the lump sum may be lower than assumed
- The actual inflation rate may be greater than assumed in the calculation of the lump sum

- Many insureds do not have the financial expertise to successfully manage a large lump sum award which may result in the lump sum being exhausted quicker than expected.
- If the insured were to die earlier than expected then their death would lead to an expected windfall to their family
- + A lump sum provides the insured with greater autonomy in that they can decide how to spend the lump sum e.g. invest in an enterprise that otherwise they may not have been able to set up or invest in.
- + It is argued that a lump sum payment may act as an incentive to rehabilitation
- + There may be medical advances that improve the insured's medical condition leading to the lump sum being more than sufficient to cover the costs of care
- + A lump sum payment provides certainty to the insurer in that once the lump sum is agreed and settled their liability is fully discharged.
- + As the insurer's liability is fully discharged there will be no further associated administration and claims management costs
- The lump sum approach exposes the insurer to the risk that the insured's projected life expectancy was over-estimated and the lump sum awarded was excessive.
- Traditional reinsurance arrangements are based on a lump sum approach and any move towards a periodic payment approach will likely lead to an increase in reinsurance premiums and will increase the credit risk to the insurer as claims will be paid over a longer period.

Given the uncertainties involved in assessing the lump sum amount, the lump sum award approach has been compared akin to looking into a crystal ball. The only certainty of this approach is that the level of compensation will either be too much or not enough.

6.3.3 Periodic Payment Orders

In October 2010 an Irish Working Group on Medical Negligence and Periodic Payments submitted a report recommending that periodic payments be introduced in Ireland for certain categories of damages for catastrophic injuries. Periodic payments involve the insurer paying regular amounts which are indexed to allow for variation in the future costs of care and treatment. Payments will continue for the remainder of the insured's lifetime.

The introduction of periodic payments will impact insurers and reinsurers in a number of ways:

Uncertainty

A PPO transfers the mortality, investment and inflation risk that, in the lump sum approach, would lie with the claimant to the insurer. This increases the uncertainty of the ultimate

claim cost as the final claim amount will only be known when the insured dies. As a result the insurer will have to maintain a reserve for a PPO claim during this time.

In theory, the insurer may be able to cede the mortality, investment and inflation risk by purchasing an index-linked annuity from a life-insurer. However, the Irish impaired annuity market concentrates on moderate impairments from medical conditions rather than severe impairments such as those suffered by accident victims that would be subject to PPOs. Unless the impaired annuity market was to develop the insurers will most likely have to keep these PPO claims on their books until the death of the insured.

Reinsurance

Within the Irish market many insurers buy excess of loss reinsurance which protects the insurer against the risk of very large claims. Many of the high layer excess of loss agreements have an indexation clause which indexes the reinsurance retention. It is possible that the index used for the reinsurance retention may be different to the index agreed in the PPO settlement and as a result the insurer will essentially be self-funding the PPO with only a distant prospect of a recovery from the reinsurer.

Due to the long-term nature of PPOs an insurer will be exposed to greater reinsurance credit risk as the recoveries will be paid over the term of the claim.

Given the uncertainty associated with PPOs there is the risk that reinsurers will leave the market for lines of business for which PPOs may be awarded. This trend has been observed in the UK where almost half of the reinsurers who provided excess of loss motor reinsurance have left the market.

Capital

Under Solvency II, capital is held to cover the uncertainty surrounding the reserves. PPOs will increase the uncertainty surrounding the final settlement amount and hence the reserve uncertainty with a knock on consequence being that the insurer will be required to hold a greater amount of capital with an associated cost.

Pricing

At present it is considered that PPOs will only apply to certain categories of damages for catastrophic injuries. The frequency of such claims in the Irish market is quite low and Irish insurers generally purchase excess of loss reinsurance with relatively low attachment points which would cover such claims. Allowing for these it is not thought that insurers' premiums are likely to rise considerably if PPOs were to be introduced.

6.3.3.1 Observations from UK Experience

In April 2005 the British Courts were given the power to impose a PPO without the consent of the parties involved. The Court has to decide whether a PPO is appropriate and best meets

the needs of the insured. Between 2005 and 2008 few cases were settled using a PPO. The main reasons for this were:

- Judges, claimants and the defendant lawyers not being familiar with the process, and
- Litigation over the indexation of payments in particular relating to the care element.

However, the financial crisis led to a sharp increase in PPO settlements as claimants sought financial certainty as investment returns reached record lows.

To date the majority of PPOs have involved motor insurance and clinical negligence which has been generally covered by the NHS.

There have been three hundred or so PPOs with private insurance companies most of which relate to motor liability claims due to the unlimited protection of motor insurance cover. The NHS currently has over one thousand PPOs; this is mainly due to the NHS's desire to settle on a PPO basis as they can pay-as-you-go instead of paying a lump sum and the insured viewing the NHS as being very secure and unlikely to default at a later stage.

Some trends emerging on PPO settlements in the UK are:

- To date the vast majority of PPOs relate to care only. The insured is willing to accept a lump sum payment regarding the loss of earnings element of the settlement but prefers a PPO for the care element of the settlement,
- Older insured's with a short life expectancy are attracted to PPOs rather than a lump sum as it guarantees a minimum level of care for the remainder of their life,
- Many of the PPOs allow for stepped levels of care i.e. the periodic payment increases in line with an earnings index, and
- It is worth noting that PPOs are used in Canada, Australia, many US States, Germany, Italy, Sweden and Belgium.

SUMMARY

- ❖ The current lump sum approach to settling claims where the insured has been catastrophically injured or requiring long-term care provides finality for the insurer on claim settlement but the insured is exposed to mortality, investment and inflation risk.
- ❖ The introduction of Periodic Payment Orders will transfer these risks, back to the insurer who it may be argued is better equipped to assess such risks, in addition to exposing the insurer to new risks.

6.4 Asbestos and Other Emerging Risks

6.4.1 Update on Asbestos

In March 2012, the UK Supreme Court ruled that liability to an insurer was triggered when victims of mesothelioma were exposed to asbestos dust, even if the symptoms developed later. Mesothelioma is a cancer that is caused by exposure to asbestos. It affects the thin protective membrane surrounding the lungs, heart and abdominal cavity.

As a result of this ruling, thousands of family members related to the victims of mesothelioma intend to claim on insurance policies dating from the late 1940s to the late 1990s. It is estimated that the ruling could cost insurers more than £100 million. Even before the ruling, the Actuarial Profession estimated the total cost of asbestos-related claims to the insurance market between 2009 and 2050 would be £11bn – 90% of which would relate to mesothelioma. Despite the cost to them, insurers' representatives welcomed the additional clarity provided by the ruling.

The Health & Safety Executive (HSE) in the UK completed an analysis of mesothelioma deaths – this shows the number to have increased from 153 in 1968 to 2,321 in 2009, with more than 80% of the deaths being males, many of them having been employed in the building industry when asbestos was still widely used. HSE UK projects that male deaths from mesothelioma will peak at around 2,100 in about 2016, whereas those for females will peak later at a much lower level.

Finally, most recently, in July the UK government launched a new £300m support scheme for people who develop mesothelioma after being exposed to asbestos at work, but are unable to claim compensation because they cannot trace a liable employer or insurer.

The new scheme will be funded by a levy on current employers' liability insurers at an estimated cost of £25m-35m a year.

At the time of writing, the authors are not aware of any recent data gathered on asbestos from an Irish perspective.

6.4.2 Asbestos Replacement Products

Recent studies and media reports indicate that asbestos replacement products may also be a cause for concern. Fiberglass and other such materials that were used to replace asbestos may also give rise to similar problems as asbestos. The jury is out on whether or not there is a genuine health risk associated with this product, and sufficient research has not yet been carried out to back up the rumours. This is certainly something to monitor, as the impact of another source of latent claims, similar to asbestos, would have substantial financial impact on insurers.

6.4.3 Emerging Risks – Introduction

Emerging risks are risks whose full nature and effects are not yet known or understood. They can have a major impact on the financial results of insurance operations as they may not be adequately catered for in insurance terms and conditions, pricing, reserving or capital setting. The main covers most affected by emerging risks are employer's liability, public liability and products liability.

Employer's liability is highly at risk, especially where employees could be exposed to unknown harmful materials. A recent study completed by the Health and Safety Executive in the UK has found that around 8,000 cancer deaths a year are thought to be work-related, in particular where asbestos, diesel engine fumes or night-shift work are involved. According to the study, after asbestos, the main work-related risk factors were night shift-work, mineral oil, sun exposure, silica exposure, and diesel engine exhaust fumes. Health risks associated with the use of mobile phones are also now coming to the fore.

This section explores some of these emerging risks.

6.4.4 Silica

6.4.4.1 Background

Silica is the second most abundant mineral in the world. It is used in many industries ranging from construction to rubber and plastics to automotive repair.

Diseases caused by exposure to silica are not common. The problem lies with inhalation of crystalline silica, which can cause a lung disease called silicosis, and other diseases including tuberculosis, and emphysema. Similar to Mesothelioma, silicosis has a long latency period, occurring between 10 and 40 years after exposure.

Some of those most at risk are construction workers, miners and glass manufacturers.

6.4.4.2 Could silica be the new asbestos?

There is a danger that silica claims could be treated like asbestos claims, and compensation for silicosis could become a grave problem for insurance companies. Silica and asbestos illnesses are similar in terms of injuries and exposure, and both have a large and overlapping pool of potential claimants. Receiving an asbestos settlement does not restrict a claimant from claiming again for injuries potentially also caused by silica exposure.

However, according to an article published recently in The Actuary magazine, medical criteria appear to be stricter for silica cases than for asbestos cases. In addition, in the US over 8,400 companies have had 730,000 asbestos claims filed against them whereas currently only 400

companies have 70,000 silica claims filed. Furthermore, over 70 companies have gone bankrupt because of asbestos whereas only two have gone bankrupt as a result of silica claims.

This may indicate that although silica liabilities will be significant, they will not be of the scale of asbestos liabilities, although the future is still uncertain.

6.4.5 Mobile Phones

6.4.5.1 Mobile Phone Research

Research into mobile phones and the health risks associated with their use has been on-going for a number of years now. A long-awaited study by the International Agency for Cancer Research — an agency connected to the World Health Organization - published its findings in May 2011. Known as the Interphone Study, it set out to assess whether radio-frequency radiation exposure from mobile phones is associated with cancer risk.

The study was conducted in 13 countries: Australia, Canada, Denmark, Finland, France, Germany, Israel, Italy, Japan, New Zealand, Norway, Sweden, and the UK. All residents in the study regions aged 30 to 59 were eligible for the study, which aimed to maximise the likelihood of exposure. Detailed questions were asked of “regular mobile phone users”, classed as those with an average of at least one call per week for a period of 6 months or more.

Overall, no increase in risk of the types of tumours studied was observed with use of mobile phones. However, as some tumours can be slow to grow, the study also noted that the interval between introduction of mobile phones and occurrence of the tumour might have been too short to observe an effect, if there was one. The study also noted that although there were “elevated odds ratios observed at the highest level of cumulative call time”, it concluded that this could be due to chance, reporting bias or a causal effect. However, this elevated odds ratio along with changing patterns of mobile phone use since the period studied, particularly in young people mean that further research is warranted.

There were suggestions of an increased risk of a certain type of tumour in the highest decile of cumulative call time, in those who reported usual phone use on the same side of the head as their tumour. However, biases and errors limit the strength of the conclusions that can be drawn from this.

However, on May 31, 2011, the agency reclassified radiation emitted by mobile devices as a possible carcinogen. It reportedly based its classification on a review of hundreds of articles published in scientific journals on health risks associated with exposure to radiofrequency (RF) electromagnetic fields.

This is just one example of the research being conducted around the world. As seen in this example, results of mobile phone research are not yet conclusive or robust enough for any immediate threat of litigation. However, any adverse development in such research could open the lawsuit floodgates.

6.4.5.2 Insurance Considerations

Currently in the US there is some litigation pending involving mobile phone manufacturers. The cases were taken by mobile phone users who are accusing companies of marketing mobile phones without adequate warnings or headsets. However, in recent years similar lawsuits have been ultimately thrown out of federal court in the US for lack of scientific evidence.

As seen in the results of the research outlined above, the outcome of mobile phone research is not yet conclusive or robust enough for any immediate threat of litigation. However, any adverse development in such research could lead to a significant number of lawsuits affecting insurance covers such as general liability, workers compensation and product liability.

6.4.6 Other Emerging Risks

There are numerous other potential emerging risks beginning to come to light, some of which include:

- **Driverless cars** - The driverless car is making steady progress towards legalization in the USA.
- **Exposure to Artificial Light** - Certain lamp types (including also incandescent light bulbs) may emit low-level UV radiation. Exposure to light at night while awake (shift work) may be associated with an increased risk of breast cancer and also cause gastrointestinal and cardiovascular disorders.
- **Nanotechnology** - Scientists from Trinity College Dublin have completed ground-breaking research which shows that individual's health may be seriously affected when exposed to nanoparticles and that this may lead to rheumatoid arthritis and other serious autoimmune disorders. The health implications linked to nanotechnology are linked to the use, manufacture and disposal of nanotechnology materials.
- **Building Standards** - Priory Hall and Belmayne are just two examples reported in the news in recent months of homes which are unsuitable for habitation because of bad planning rules and weak regulation. The issue of who will ultimately pay for the financial loss suffered by the homeowners affected is still outstanding. More and more developments like these are coming to the fore. The cost of the extensive work needed will run into tens of millions of euro. With the developers unable to pay, and the councils claiming that they are unable to take on the responsibility of fixing what

obviously needs to be fixed, it could ultimately fall to banks and insurance companies to foot the bill.

These are only a handful of the numerous emerging risks that are beginning to become a concern for insurance companies.

6.4.7 How can the Insurance Industry deal with these emerging risks?

It can be difficult to quantify potential exposure to emerging risks, as it can be difficult to determine the likelihood of claims occurring, how much they could cost, and what covers would be affected.

Understanding emerging risks is the first step towards mitigating them. Catastrophe models enable insurers to better measure and manage their catastrophe exposure. Models recently developed are now also helping insurers exposed to emerging risks to better evaluate and understand their risks.

A recent article in the Actuary magazine examined how recent advances in casualty catastrophe modelling make it possible to prepare for the next asbestos.

An extract from the article reads:

“Instead of modelling the physical characteristics of an event, such as location, wind speed, diameter or seismic intensity for a natural catastrophe, the insurance-related characteristics of a mass tort event can be modelled, such as total losses, number of affected entities, reporting lag, triggered policy years and the potential correlations between these characteristics.

The models cannot answer the question of what the ‘next asbestos’ will be, but they can inform us how the next asbestos might affect insurers.”

Uses of such casualty catastrophe models include, but are not limited to:

- Simulating latent claims to help understand reserve risk and use in capital modelling,
- Estimating the adjustment to be included in an insurer’s technical provisions required by Solvency II, and
- Prospectively measuring the impact of underwriting or risk management strategies for casualty business, e.g. entering into a different industry.

As well as using casualty catastrophe models, another way of attempting to mitigate emerging risks under Employer’s liability and Public Liability covers can be by ensuring employers take the right safety precautions, for example:

- using and maintaining dust control systems,
- requiring that workers wear disposable or washable protective clothing

- conducting regular air monitoring,
- using respirators when levels of silica and other dust particles are high,
- posting warning signs and educating workers about substances such as silica and how to prevent its inhalation.

Policy terms and conditions can also be used to mitigate tail risk, e.g. sunset clauses, which restrict the time period in which claim a claim can be reported and covered under the policy.

SUMMARY

- ❖ UK Government made significant announcements in 2012 providing comfort to mesothelioma sufferers and their families.
- ❖ Recent studies and media reports indicate that asbestos replacement products may be a cause for concern.
- ❖ Emerging risks are risks whose full nature and effects are not yet known or understood.
- ❖ Emerging risks can have a significant financial impact on insurers, and so should be investigated and monitored closely.
- ❖ The research into health effects of Mobile Phones is on-going, but not yet conclusive.
- ❖ The risk landscape is constantly changing with new technological developments, as well as changes to the legal and regulatory environment.
- ❖ Models recently developed are helping insurers exposed to emerging risks to better evaluate and understand their risks.
- ❖ These models are just one way to mitigate and understand emerging risks
- ❖ While emerging risks do have potential downsides, they also represent business opportunities for the General Insurance Industry, as customers seek to protect themselves from such risks.

6.5 Climate Change and Resource Depletion

6.5.1 Background

The twin phenomena of climate change and resource depletion have received considerable attention from the media in recent years. As the evidence of their far-reaching effects has become more and more pronounced, the chorus of climate change sceptics has been gradually silenced.

It is clear, however, that the financial implications of climate change have not yet been adequately addressed. The insurance industry may be severely impacted over the coming decades and actuaries have a key role in ensuring a smooth passage into a new environment. While considerable challenges will be posed, opportunities will also be created for actuaries in the areas of model-building, managing uncertainty, risk transfer and product pricing.

The response of the general insurance industry to the liability-related risks of climate change has, on balance, been more advanced than the responses of their life insurance, health insurance and pension counterparts to date. This is largely due to the global nature of the risks that are underwritten by general insurance companies and the relative vulnerability of insured properties to weather-related events. This section of the paper focuses on the risks and opportunities that climate change presents to the general insurance industry from an international perspective.

6.5.2 What are the effects of climate change and resource depletion?

Throughout this section, the following definitions as set out in the Intergovernmental Panel on Climate Change Third Assessment Report "Climate Change 2001", i.e. are used:

- **Climate change** refers to a statistically significant variation in either the mean state of the climate or in its variability, persisting for an extended period (typically decades or longer).
- **Climate variability** refers to variations in the mean state and other statistics (such as standard deviations, the occurrence of extremes, etc.) of the climate on all temporal and spatial scales beyond that of individual weather events.
- **Resource depletion** refers to the continued consumption of finite natural resources such as oil, coal and gas. There is growing scientific evidence that "peak oil" - or the point at which the rate of oil production peaks - is close at hand, which means that oil prices will continue to increase over time. The upsurge in demand for fossil fuels from developing countries will accelerate this energy supply crunch, and the resulting inflation may lead to a global recession.

It is widely accepted that extensive greenhouse gas emissions over the past century have caused a dramatic increase in global CO₂ levels. This, in turn, has led to a 0.7°C increase in global temperatures over the past 100 years, with the rate of increase having accelerated considerably over the past three decades. The linear warming trend over the 50 years from 1956 to 2005 (+0.13°C per decade) is almost twice that for the 100 years from 1906 to 2005. By 2007, eleven of the previous twelve years (1995-2006) were counted among the twelve warmest years since records of global surface temperature began in 1850.

Annual average Arctic sea ice has shrunk by 2.7% per decade since the late 1970s, with larger decreases in summer of 7.4% per decade. On 16th September 2012, the Arctic sea ice reached its lowest level ever recorded, i.e. 3.41 million square kilometres. This stands at approximately half of the 1979-2000 average and represents a loss equal to 41 times the area of the island of Ireland.

Melting of the polar ice caps causes more solar energy to be absorbed by the surface of the Earth, which distorts the planet's natural "air-conditioning" system. It also contributes to increases in global sea levels which, if they continue, will pose a major threat to communities living in low-lying and easily-flooded coastal regions such as the Philippines.

There has been evidence of a rise in intense tropical cyclone activity in the North Atlantic Ocean since about 1970, although new research by the Willis Research Network suggests that Atlantic hurricanes will be stronger but less frequent over the coming century. Citing one recent example, the catastrophe modelling firm Risk Management Solutions (RMS) has estimated that insured losses arising from Hurricane Sandy - which struck the east coast of the USA in November 2012 - could reach \$25 billion. In addition, heat waves have become more frequent over most land areas during the past 50 years, and it has been estimated that the heat wave in North America during the summer of 2012 has reduced crop yields in the USA by over a third.

Researchers supported by the Global Facility for Disaster Reduction and Recovery have simulated 5,000 hurricanes in the Atlantic Ocean, with and without allowing for climate change. Their key finding has been that income and population growth alone will lead to an increase in baseline damages in the USA from \$9 to \$27 billion per year by 2100, and that climate change is likely to increase the damage tally by another \$40 billion. Over 85% of these effects are expected to be in Florida and in the other states bordering the Gulf of Mexico, with 93% of the losses being caused by the 10% of storms that are most damaging.

Here in Ireland, there has been a high incidence of severe weather events over the past twelve years, as the follow table outlines:

Month	Event Description	Insured Losses (€m)
October 2011	Flood	127
December 2010	Freeze	224
January 2010	Freeze	297
November 2009	Flood	244
January 2009	Storm	16
January 2009	Freeze	40
August 2008	Flood	96
October 2004	Flood	38
November 2002	Flood	50
February 2002	Flood	37
December 2001	Freeze	30
November 2000	Flood	51

Source: Table produced by Irish Insurance Federation (IIF), 2012

Experts now predict that, if current trends continue un-checked, a 3°C increase in global temperatures will occur by 2100. Putting this into context, it was suggested by Hans-Joachim Schellnhuber at the Climate Change summit in Copenhagen in 2009 that a world that is 5°C warmer will be able to support only a fraction of its current population. Unless decisive action is taken to prevent such an increase in temperature, it is likely that mass migration, rises in sea levels, storm and hurricane damage, fresh water contamination and ecosystem damage will conspire to make the planet a less hospitable place in which to live. The time is clearly ripe, therefore, for general insurance actuaries to play an active role in safeguarding society against these catastrophic effects of climate change and resource depletion.

6.5.3 Threats to the General Insurance Industry

The general insurance industry has historically based the pricing of its products on statistical projections of past experience. The uncertainty implied by climate variability, however, may imply that past experience no longer provides as good a guide to the future over the medium-to-long term as had previously been thought. While the frequency and severity of claims is bound to increase across many lines of business, there is a large amount of uncertainty about the timing and extent of these changes, and this may pose a challenge to the general insurance business model.

Increased uncertainty will undoubtedly lead to an increase in risk capital requirements within the general insurance industry. The cost of capital for insurers will escalate as a result because investors will demand a rate of return that is at least equivalent to that on other available investment opportunities. Capital management will grow in importance as insurers struggle to maintain sufficiently high solvency capital ratios in a cost-effective manner.

Some key climate-related risks that exist on the liability side of a general insurer’s balance sheet are set out below:

- Correlations between the risks written on various lines of business in the face of a severe weather event may be difficult to quantify precisely, given the relative shortage of historic data.
- Currency risk may become increasingly significant, as insurers will become exposed to increasingly volatile exchange rate movements as a result of wrangling between countries over ever-scarcer natural resources, e.g. the war in Iraq. This could cause increased risks in situations where there is a mismatch between assets and liabilities by currency, and may lead to insurers having to hold higher levels of capital.
- Reputational risk for the insurance industry may increase as society becomes more dependent on the ability and willingness of insurers to pay claims.
- More frequent and severe tail events that lead to catastrophic losses for the general insurance industry could result in one or more insurers becoming insolvent. This could erode confidence in the industry as a whole, leading to a degree of systemic risk.
- Litigation and regulation costs may increase as claims from emerging classes of business (e.g. claims on carbon insurance policies) are pursued through the courts and governments introduce legislation to accelerate the transition from a high- to a low-carbon economy.
- The frequency and severity of claims on the various lines of business written by general insurers may increase, as summarised below.

Claim Trends

Class of Business	Claim Type	Meteorological Cause
Commercial/ Residential Property	<i>Subsidence</i>	Global warming may cause periods of drought, which will increase the risk of subsidence.
	<i>Storm Damage</i>	Rising sea temperatures will increase the frequency and severity of storms in coastal areas.
	<i>Flooding</i>	Rising sea levels will increase the incidence and intensity of rain and floods.
	<i>Burst Pipes</i>	Increased climatic variability will lead to prolonged spells of

		icy weather, causing pipes to burst in properties.
Motor	<i>Bodily Injury and Property Damage</i>	Adverse weather conditions will impair driving ability, leading to an increased incidence of road traffic accidents and, hence, to more claims.
Travel	<i>Medical, Liability, Property</i>	Increased delays and cancellations due to bad weather may result in more frequent claims, injuries or illnesses sustained due to climatic conditions may necessitate medical treatment while travelling, loss of or damage to luggage due to severe weather events may increase claim outgo.
Liability	<i>Employers' Liability</i>	Workers exposed to UVF rays may be able to sue their employers for not adequately protecting them from skin cancer (see <i>Asbestos and Other Emerging Risks</i> section)
	<i>Directors and Officers (D&O)</i>	Directors may be sued by a) shareholders, for not taking sufficient measures to mitigate the risks to their business caused by climate change, or b) environmental activists, for taking part in activities which are believed to have exacerbated the effects of climate change.
	<i>Professional Indemnity</i>	Engineers, architects and other professionals operating in the construction sector may be sued for not having included measures to defend against flooding, subsidence, fire, etc. in their plans.
	<i>Mortgage Indemnity Guarantee</i>	Increased flood and storm risk could cause a sharp decline in property prices in affected areas, and this could increase claim severity if lenders are forced to sell properties after customers default on their mortgages.
Agricultural and Forestry	<i>Property Damage</i>	Climate change may lead to stunted and / or poorer-quality harvests; managed forests may be damaged by storms, hurricanes and other such events.
Marine and Aviation	<i>Marine</i>	More frequent and / or severe weather events could generate increasingly uncertain losses on marine insurance, e.g. damage to the cargo or hull as well as liability to passengers, crew, port authorities, etc.
	<i>Aviation</i>	Storms, lightning and other such weather events could damage planes and jeopardise the welfare of passengers and crew. Also, airlines could potentially be sued by environmental campaigners who believe that their activities have been instrumental in bringing about climate change.

Impacts on Assets

The assets held by general insurance companies may be impacted by climate change, as outlined below:

Asset Class	Impact Category	Cause of Impact (If Any)
Cash	Weak	Cash will remain a stable and safe repository for insurers' funds.
Bonds (Government and Corporate)	Moderate	Uncertainty in the investment market as a result of climate change will lead to a "flight to safety" and increased demand for bonds. This will push up bond prices and simultaneously reduce yields and investment returns.
Equities	High	Equity prices are linked to economic growth. Overall, climate variability is likely to dampen growth prospects, which will lower equity values and directly reduce investment profits for insurers. Some individual shares are, however, likely to be bolstered by climate change, e.g. renewable energy companies.
Property	High	Damage may be caused directly to properties owned by insurance companies, or property assets could suffer the indirect effect of lower valuations as a result of increased climate-related risk.

In 2009, the global insurance industry (both life and general insurance) had assets under management of USD 55 trillion. The short-tailed nature of property damage risks implies that real, long-term asset classes such as property and long-dated bonds are of less importance to the general insurance than to the life insurance industry. It is nonetheless important for general insurers to ensure that they take climate risk into account in formulating investment strategies, so that their profits are not un-necessarily eroded by poor performance on the assets that they hold.

Large multinational companies – the equity of which may form part of a general insurer's investment portfolio - are exposed to climate change through their use of sophisticated systems and technologies and their location of premises and suppliers in developing countries. Insurance companies that underwrite risks in developing countries are likely to be relatively more exposed to climate change risk than their counterparts in the developed world, as the damage caused by natural catastrophes in developing nations tends to be greater as a proportion of written premium due to poorer infrastructure and more adverse weather conditions. (On the other hand, insured values in developing countries tend to be lower than in well-developed economies and this may offset this effect to some extent.)

As mentioned above, the depletion of natural resources may have profound implications for the global economy. The financial and insurance risks relating to this are detailed below:

- An oil supply crunch could produce high inflation, leading to a knock-on increase in interest rates. A global recession or depression is one possible consequence of this.
- High inflation could lead to a surge in demand for real assets and a parallel fall in the demand for fixed assets.
- A reduction in the supply of oil could lead to a fall in the share prices of companies that consume large amounts of energy (e.g. airlines) and a corresponding increase in the share prices of companies that produce energy.
- General insurers may endure higher claims costs as a result of a global recession.

6.5.4 How can general insurance actuaries respond to climate change and resource depletion?

The financial and statistical expertise possessed by actuaries makes them ideally-placed to develop effective solutions to climate-related risks. Such solutions, if they materialise on the scale that is required, will prove hugely beneficial to both the insurance industry and society as a whole. Below is a summary of the key opportunities that exist for general insurance actuaries in this area.

6.5.4.1 Model-building

In recent years, actuaries have developed sophisticated modelling techniques as a result of the central role that they have played in, for example, building and validating Solvency II internal models, developing catastrophe models and constructing generalized linear models (GLMs). The skills that actuaries use in the complex modelling of long-term risks may be drawn on in order to review and improve existing climate economics models, e.g. incorporating stochastic elements to reflect climate variability.

Actuaries may be able to refine the existing approaches to catastrophe modelling in order to produce more accurate estimates of losses from climate change. Advanced proprietary catastrophe models are currently provided by firms such as RMS, AIR and EQECAT. Catastrophe modelling is a developing science and, as such, the latest models contain some mathematical approximations and simplifications that can lead to results that differ widely from one model to another. There may be scope for actuaries to improve the functionality of catastrophe models in order to better inform insurers, scientists and policy-makers about the potential financial ramifications of climate change.

To date, asset-liability modelling (ALM) analyses have comprised very few scenarios that allow for the effects of climate change and resource depletion and, consequently, very few changes in strategy have been implemented. Given that climate change is a highly tangible (if un-quantified) risk for general insurance companies, actuaries should be much more proactive about developing models and / or stress tests to assess its impact, as well as in making

allowances for climate change in the derivation of long-term assumptions such as the discount rate.

6.5.4.2 Investment Strategy

As mentioned above, long term investment risks are not as significant for the general insurance as for the life insurance and pensions industries. However, there are still opportunities for general insurance actuaries to communicate more effectively with insurance asset managers, in order to promote awareness of the exposure of investment portfolios to climate change risks.

General insurers could also make a transition from investing in high-risk assets (such as properties in the coastal zones of vulnerable regions) to more eco-friendly assets, e.g. the equity of renewable energy firms. This shift in investment strategy may encourage businesses to produce environmentally-friendly goods and services and may incentivise real estate developers to engage in more sustainable property design.

Solar21, the Irish fund which was established in 2010 and invests more than €100 million in photovoltaic solar farms across Europe, is a prime example of the type of “green” fund which may prove attractive to insurance investors in future years. New investment classes such as carbon funds and catastrophe bonds (see below) may also become viable alternative investment options for general insurers.

6.5.4.3 Carbon Accounting

From April 2013, all businesses listed on the Main Market of the London Stock Exchange will have to disclose the levels of greenhouse gas emissions for their entire organisations in their annual reports. Greater transparency surrounding the levels of carbon emissions will enable policy-makers to extend more favourable treatment to “greener” businesses. For example, incentives and tenders may be granted to companies with low emission rates, and more taxes may be imposed on comparatively high emitters.

Actuaries have an in-depth knowledge of financial reporting. They will, as a result, be able to monitor the success of emission-reducing strategies by including carbon emissions in solvency and other business projections. In addition, actuaries may be able to extend their insurance models to fairly allocate incentives to companies that engage in environmentally-friendly activities. They will need to clearly communicate the link between carbon emissions and financial rewards to clients in order to achieve the desired reductions in greenhouse gas emissions.

6.5.4.4 Extending the Breadth and Scope of Insurance Cover

General insurance actuaries can play a pivotal role in the pricing and product design of new types of insurance, e.g. carbon insurance, which covers the risk that carbon offsetting projects fail to provide the carbon credits that they initially anticipated. They may also be instrumental in offering traditional insurance cover to new operations such as hydro-power stations and solar plants, which will become increasingly important as the transition to a low-carbon economy gathers momentum.

The most vulnerable segments of society are often deprived of access to insurance cover due to financial constraints. General insurance companies should unite to raise awareness of the ever-increasing importance of insurance protection and to provide affordable ways for lower socio-economic groups to access coverage so that they will not be unduly exposed to the damages caused by climate change.

6.5.4.5 Insurability

General insurers should consider ways to encourage their clients to adapt to increased climate-related risks, e.g. rewarding customers who reinforce their buildings to protect against storm damage or install flood defence mechanisms. These risk mitigation measures may be incentivised by premium reductions or other favourable product design features such as lower excesses. Pricing actuaries have a vital role to play in quantifying how measures taken to reduce climate-related risks can be incorporated into a rating structure.

Actuaries may also wish to consider the merits of entering into public-private partnership programmes whereby insurers liaise with government to promote stronger building codes, reward clients whose properties have been approved by recognised authorities and so forth. In Scotland, for instance, insurance companies engage actively with local councils to raise awareness about flood risk, assist small businesses with the management of claims and encourage the purchase of insurance cover. The significance of the insurance industry's role in providing advice to the public and to the commercial sector about the benefits of insurance protection cannot be under-estimated, and actuaries can help to guide clients towards climate-friendly products by employing innovative pricing and product design strategies.

In Ireland, a much greater proportion of homes than in other European markets have access to flood insurance. To improve the situation further for Irish householders, the IIF is currently liaising with the Office of Public Works (OPW) to help ensure that flood defence mechanisms are constructed where necessary. The OPW also supplies the insurance industry with important information in relation to flood defences to assist with insurance risk assessment, e.g. flood maps showing the likely protection that will be offered by flood defence mechanisms, details of the design standards of the defences, etc.

6.5.4.6 Alternative Risk Transfer

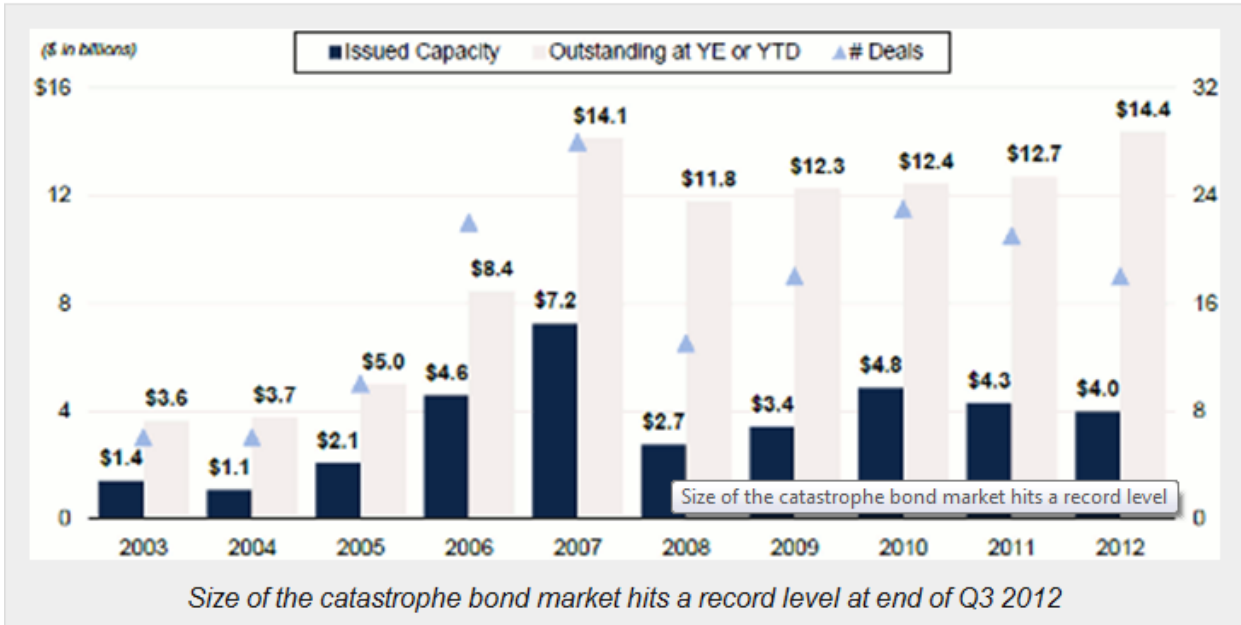
Insurance companies can pass on a portion of their climate-related risk to the consumer through higher premiums, but a sizeable degree of risk remains on their balance sheets. Reinsurance cover may be expensive or of limited availability and, for these reasons, many insurers opt to transfer residual risk to the capital markets by purchasing catastrophe bonds, catastrophe swaps or weather derivatives. Government pooling schemes may also be used to subsidise some weather-related insurance risks so that cover is affordable for and available to the general public, e.g. negotiations on government subsidisation of flood risk are currently underway in the UK.

Catastrophe bonds and swaps operate in a similar fashion to traditional bonds and swaps, although repayment of the principal amount is contingent on non-occurrence of a defined catastrophe event over a specified time horizon. Weather derivatives include call and put options on weather events, with the key difference from traditional derivatives being that the underlying index (rain, temperature, snow, etc.) is non-tradable and has no directly measurable value.

The first three quarters of 2012 have shown exceptionally high levels of activity in the catastrophe bond market. This has, according to the advice of Willis Capital Markets and Advisory, brought the market for catastrophe bonds to a record high in terms of volume. At the end of the third quarter of 2012, the size of the outstanding natural catastrophe bond market was \$14.4 billion, which is higher than the \$14.1 billion which was recorded at the end of 2007.

The size of the market has grown substantially due to the fact that no bonds have matured in the third quarter of 2012. Losses from Hurricane Sandy - or any other natural catastrophe which occurs before the end of the year – could reduce the size of the market somewhat but the effects of this are not expected to be significant.

The graph below shows catastrophe bond issuance, market size and number of transactions by year from 2003 to the end of the third quarter of 2012:



Demand for catastrophe bonds has been strong in the face of challenging market conditions. In 2011, full losses of principal were incurred on the Muteki Ltd. bonds as a result of the Tohoku earthquake in eastern Japan, and on the Mariah Re bonds due to a severe tornado season in the USA. Despite these losses, returns offered by the catastrophe bond market are still appealing due to competitive pricing and to the lack of correlation between market risk and catastrophe risk, with investors being keen to diversify their portfolios by participating in this market.

6.5.4.7 Micro-insurance

Micro-insurance is defined as insurance that is targeted at low-income customers in developing countries, who will require ever-greater protection against severe weather events as climate change escalates. The range of insurance products that is typically offered by a micro-insurance provider includes life, health, crop, livestock, personal accident and other such covers. Since the majority of the population of the developing world depends on agriculture, crop insurance is of primary importance among these cover types.

Farmers in developing countries are extremely vulnerable to adverse agronomic events, such as droughts, crop blights and floods. Without a viable risk management system in place, such farmers may easily find that their yearly harvest is destroyed and that they are unable to subsequently provide for their families. The likelihood of such disasters happening will

increase as the global mean temperature increases and natural catastrophes become more frequent and severe.

In the absence of insurance cover, farmers tend to either: a) pool risk among their extended families, neighbourhoods or ethnic groups, or b) plant crops which have un-correlated yields. These strategies deal effectively with minor agricultural disruptions but have limited use in the face of a severe weather event. The importance of micro-insurance strategies to the livelihoods of these farmers cannot be under-estimated as a result.

There are two main forms of crop insurance which have been promoted among participating insurers, as described below:

- The **indemnity basis** directly compensates farmers for the losses that they have incurred. The advantage of this is that the claim payments are targeted at the customers most in need of them - in much the same way as our own car or home insurance claim payments operate in the developed world.

The key disadvantage, however, is that the farmers' declared losses are difficult for the insurance company to verify, and that fraud or moral hazard may arise as a result. Farmers may be tempted to over-state their losses, to conceal perfectly good harvests or even to deliberately neglect their lands in order to make claims.

Possible solutions to this include implementing no-claims discounting systems or employing local assessors to report regularly to the insurer on the standards of farming practices on insured lands. Group stop loss indemnity insurance is another option available to insurance companies, whereby claims are a function of the aggregate crop loss which has been suffered by a large group of farmers who are jointly insured.

- The **indexed basis** relates claims to an index that has been chosen as a good proxy for incurred crop losses. Weather index insurance generates claim payments that are based on recorded weather conditions (e.g. temperature, rainfall, etc.) at a specific weather station. Area yield insurance, or insurance cover that is related to average local yields for a given crop, may also be effective – although regular harvesting experiments need to be carried out in a sample of local farms in order to deduce the average crop yield.

The key advantage of indexed crop insurance is that claim payments are triggered objectively, by an index. This reduces the potential for fraud in that individual farmers cannot manipulate their own crop losses to maximise their claim payments.

It also allows claim payments to be processed more speedily than under the indemnity basis, because claims assessors do not need to verify each individual loss.

The main drawback of this type of insurance is the basis risk that it generates. Basis risk means that, for an individual farmer, the claim payment may not be adequate to cover the losses that he or she has incurred. Claims will be calibrated to compensate farmers for the average local crop loss, but some farmers may have been more severely affected than others and will not receive a sufficiently high payout. Conversely, farmers who have emerged relatively unscathed from the crisis may receive claim payments that they do not need.

Recorded weather conditions at the selected weather station will not fully reflect the small variations in weather that occur across the region, and it will therefore be impossible to ensure that the index mirrors the true risk cost for each plot of land.

The expertise of actuaries in the areas of pricing, reserving and capital / risk management can prove very useful in the provision of technical assistance for micro-insurance products. Specific challenges faced by insurance providers include marketing the products so that they are easily understood by potential customers, collecting the data that underlie the weather and yield indices in as cost-effective a manner as possible and minimising basis risk. Since insurance penetration in developing nations is often low, it may be necessary to package micro-insurance products with loan or savings products in order to maximise take-up volumes.

Insurers can finance their micro-insurance product offerings by means of reinsurance, government funding, catastrophe bonds, mutuality, pooling and self-financing.

Reinsurers such as Swiss Re and Munich Re have launched micro-insurance initiatives which aim to research and fund the developments of micro-insurance products in the developing world. A number of high-profile insurance brokers are also active in this market, e.g. Marsh Microsecure (based in India) and Guy Carpenter.

6.5.5 Conclusion

In summary, the diverse areas of climate change and resource depletion provide ample opportunities for actuaries to make a real difference to the most vulnerable members of society. Major challenges will be faced by actuaries and other professionals in doing so, however, given that an overhaul on the scale of the Industrial Revolution will be needed to move from a high-carbon to a low-carbon economy in the medium-term. Few can deny that actuaries who apply their quantitative skills in a creative and forward-looking manner to make “financial sense of the future” will be in great demand in the years to come.

SUMMARY

- ❖ Climate change and resource depletion are causing increasingly erratic weather patterns and creating uncertainty around fuel availability. Past experience can no longer be seen as a good guide to climate-related losses over the medium-to-long term.
- ❖ Threats exist to the general insurance industry on both the asset and liability side of the balance sheet, and greater levels of uncertainty will also necessitate the holding of greater volumes of capital.
- ❖ Actuaries have the opportunity to help address the challenges posed by climate change and resource depletion by using their sophisticated model-building skills to refine the prediction of weather-related losses.
- ❖ They can also make a valuable contribution in areas such as formulating investment strategies, pricing and designing new covers (such as carbon insurance), re-designing existing covers to incentivise risk mitigation measures, communicating and refining carbon accounting techniques, designing and valuing ART products and helping with the development of micro-insurance products.

7 Cross-Practice

7.1 Solvency II Update

7.1.1 General Update on Solvency II

7.1.1.1 Timeline

The overall aim of Solvency II is to apply a more risk-sensitive and market-consistent regulatory regime across EU Member States. The project has been underway for over 10 years. The original implementation date was planned for October 2012, it is now unclear when it will take place and is likely to be 2015 at the earliest.

The table below sets out the implementation process and how each Level has progressed so far:

What is it?	What does it include?	Action?	Who decides?	Target Date
Level 1	Solvency directive	Overall framework principles	European Commission	Finalised Omnibus II due October 2012
Level 2	Implementing measures	Detailed implementation measures	European Commission	Final Level 2 proposed text for end 2012
Level 3	Supervisory standards	Guidelines to apply in day-to-day supervision	EIOPA	Pre-consultation in progress
Level 4	Evaluation	Monitoring compliance and enforcement	European Commission	

EIOPA here refers to the European Insurance and Occupational Pensions Authority, a financial regulation authority of the EU. EIOPA have been advising the European Commission on the development of Solvency II.

The Solvency II Final Level I text needed to be adapted to reflect the Lisbon Treaty. Thus the European Commission proposed an Omnibus II Directive in January 2011. However Omnibus II still needs to be agreed by three parties within the EU known as the Trialogue: the

European Commission, European Council and European Parliament. Each party has published their own version of Omnibus II and there are a number of areas of disagreement.

7.1.1.2 Current Topical Issues

The 2008 financial crisis and more recent sovereign debt crisis have highlighted a number of shortcomings with the Solvency II requirements. There is a risk that, as more and more resources and attention are diverted to dealing with the Eurozone crisis, it will lead to further delays in Solvency II implementation.

Some of the issues currently being debated include:

- Zero credit risk treatment for government bonds is no longer consistent with economic reality, with several Eurozone countries in bailout programs i.e. Ireland, Greece and Portugal. There is a proposal to adapt the calculation of “Own Funds” to reflect higher risk in some government bonds. “Own Funds” are essentially assets minus liabilities, although some restrictions apply. While it is generally accepted that zero credit risk is not appropriate, there is disagreement on an appropriate formula to apply.
- Much debate centres on the calculation of “Technical Provisions” for products offering long-term guarantees. “Technical Provisions” are the amount that an insurer needs to hold to meet its expected future outgo on an insurance contract. In late 2012/early 2013, EIOPA will carry out an assessment of the impact of proposed measures on long-term guarantees held by undertakings. These measures are discussed in more detail in section 7.2.

The European Commission has now proposed to delay the vote on the final Omnibus II text until after the Long-Term Guarantee Assessment in early 2013.

Following repeated delays, there is much uncertainty about when Solvency II will be implemented and in what form. What is certain, however, is that decisions taken in the coming months will be crucial to the future of the Solvency II project.

7.1.2 Assessment of Long-Term Guarantees

There is a risk that insurance products with Long-Term Guarantees may be impacted by artificial volatility in Technical Provisions, Own Funds and capital requirements under Solvency II. This type of volatility doesn't reflect changes in the financial position or risk exposure of the undertaking. An example of this artificial volatility would be an insurer holding corporate bonds where the value of the bonds drops due to a lack of liquidity. In this case, the insurer's capital requirements increase despite the fact that they may intend to hold the bonds to maturity.

Without measures to deal with this artificial volatility, there is a risk that capital requirements on long-term products would increase sharply. In such environment, many insurers would be unwilling to offer longer-term products.

The Long-Term Guarantee package under Solvency II is aimed at removing this artificial volatility and includes measures such as:

- Counter-cyclical Premium to be applied in times of financial stress to avoid unnecessary volatility in results. This measure would only apply when there is a short-term market stress, which doesn't reflect long-term risks and will be determined by EIOPA. This adjusted yield curve will increase the discount rate, thus reducing liabilities, and so lessening the shock to the insurer's balance sheet,
- Extrapolation of the swap curve (Section 7.1.2.1), and
- Matching Adjustment (Section 7.1.2.2)

As briefly described above, these measures are subject to much debate between various stakeholders and the Trialogue parties. EIOPA is conducting an assessment to gauge the effects the implementation of the package would have on policyholders, insurance/reinsurance undertakings, supervisory authorities and the financial system as a whole. The assessment is expected to take place in early 2013. One of the key measures proposed as part of the Long-Term Guarantee package is the Extrapolation of the Swap Curve.

7.1.2.1 Extrapolation of the Swap Curve

At present, there is much debate over the appropriate discount rate to use when discounting liability cashflows under Solvency II. The debate centres on:

- what the discount rate is based on,
- what it should ultimately trend towards, and
- how it should reach that ultimate rate.

The Solvency II risk-free rate is based on an interest rate swap curve, which is then adjusted to allow for credit risk. In deriving the Solvency II risk-free rate, it is first necessary to determine the furthest point along the swap curve that is based on market data in a liquid market. This point is known as the "Entry Point" or "Last Liquid Point" on the swap curve. The next step is to extrapolate the curve beyond this point.

The key inputs for an extrapolation are:

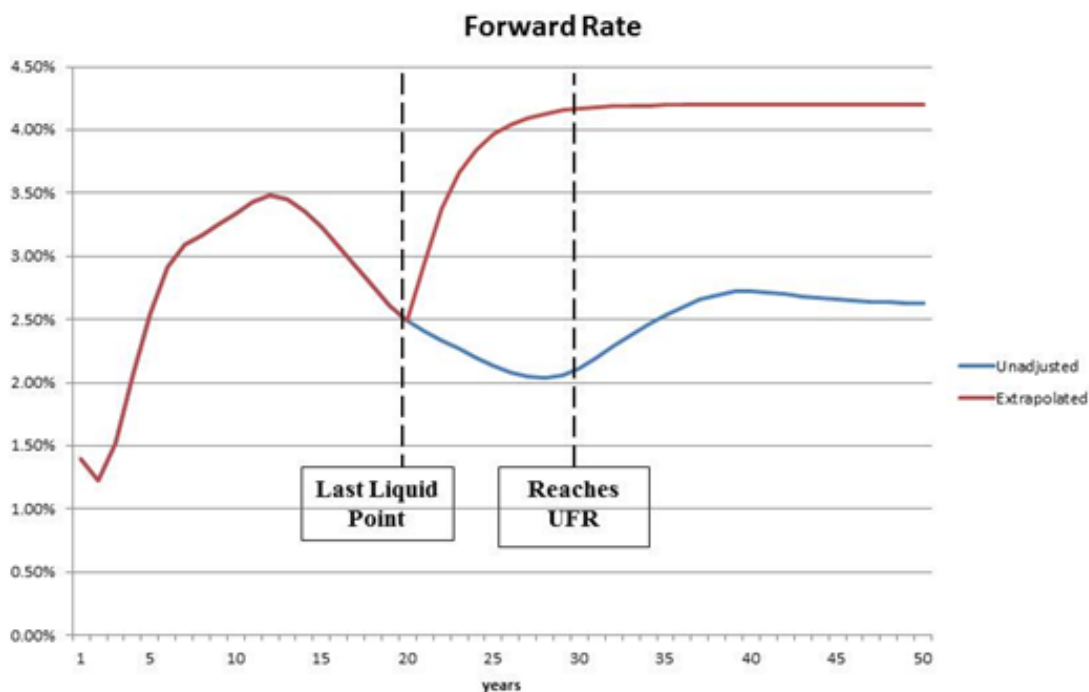
Input	Description	ECON Proposal	QIS5 Proposal
Entry point	Last Liquid Point of swap curve	20 years	30 years
Ultimate Forward Rate (UFR)	Rate that swap curve should converge to	4.2%	4.2%
Maximum Period of convergence	Period between entry point and reaching UFR	10 years	40 years

As can be seen from the above table, the latest proposals from the European Commission (ECON) are significantly different from those used for QIS5 and have sparked much debate. The ECON proposal implies that the swap curve reaches the Ultimate Forward Rate after 30 years (i.e. Entry point of 20 years and Maximum Period of Convergence of 10 years) for Euro-denominated liabilities. Some argue that this is too short a time period. For instance, for QIS5 this period was 70 years (i.e. Entry point of 30 years and Maximum Period of Convergence of 40 years).

The ECON proposal will have a very significant impact on undertakings offering long-term guarantees. The shorter the convergence period, the more sensitive the extrapolated swap curve is to the ultimate forward rate.

There is also debate about whether an ultimate forward rate of 4.2% is appropriate. The 4.2% represents a 2% allowance for inflation and a 2.2% long-term growth assumption. The graph below shows the extrapolated swap curve which reaches the Ultimate Forward Rate after 30 years as per the current ECON proposal.

The graph below shows the impact the proposed extrapolation method would have on the December 2011 forward rate curve. As a simple example, consider an outgo of €100,000 due in 40 years' time. Using an unadjusted yield curve, this has a present value of €36,471. If an extrapolated yield curve is used, the present value is €26,386. This is a 28% reduction in the liability.



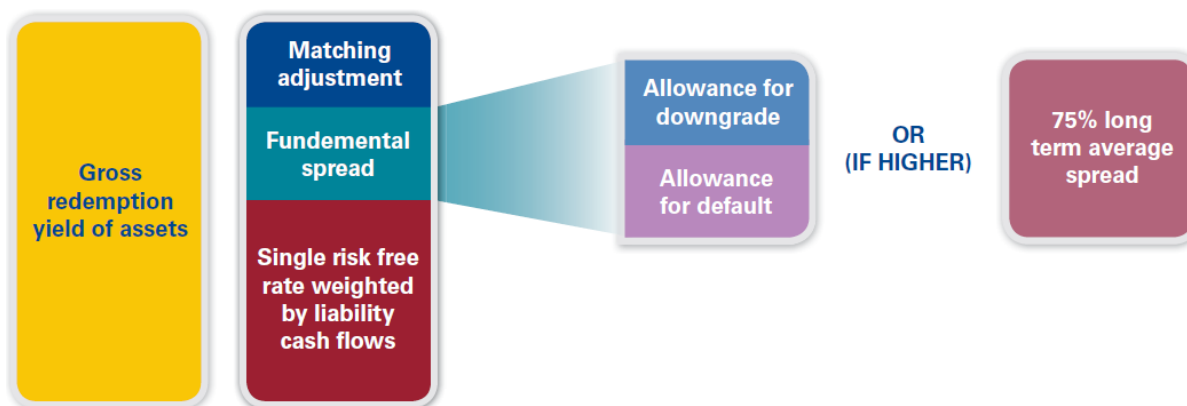
The extrapolation method proposed by ECON is being investigated by EIOPA as part the assessment of Long-Term Guarantees. Following the completion of this investigation, there should be a clear approach to extrapolating the swap curve.

7.1.2.2 Matching Adjustment

As the liability cashflows underpinning annuity products are relatively predictable, annuity providers can often hold matching assets (i.e. bonds) until maturity of the liability. The spread on a bond is the difference between the yield on that particular bond and a risk-free bond of the same term. This spread above the risk free rate makes an allowance for default risk, downgrade risk and a liquidity premium.

The liquidity premium is the extra yield earned on bonds which are traded less frequently. In general, annuity providers can increase their discount rate to reflect the liquidity premium they benefit from if holding assets to maturity. Under Solvency II, the method of allowing for the liquidity premium is known as the “Matching Adjustment”.

To calculate the Matching Adjustment, the annuity provider quantifies a) the Gross Redemption Yield of assets matching liabilities and b) the single rate equal to the risk free rate weighted by liability cashflows. The difference in these two figures is known as the Total Spread. The portion of the Total Spread attributed to default and downgrade risk is the Fundamental Spread. The Fundamental Spread must be at least 75% of the long-term average spread of the undertaking’s assets. The remaining portion of the spread equates to the Matching Adjustment.



Source: KPMG: *The Solvency II Discount Rate*

A Matching Adjustment can only be applied under certain conditions. These conditions restrict the type of product and matching assets that can be used. However, there is still disagreement on exactly what these conditions should be. The European Commission has

proposed one set of conditions, while EIOPA has proposed another. There are still some Member States who question the need for a Matching Adjustment at all.

The assessment of Long-Term Guarantees will also gauge the impact of these proposals and it is hoped a final proposal will be published afterwards.

7.1.3 Role of Actuaries under Solvency II

In this section, we look at how the role of actuaries working in life insurance and non-life insurance in Ireland might change with the introduction of Solvency II. We ask what functions actuaries will carry out within undertakings in a Solvency II world. We also ask how their new roles will differ from the current roles they fill?

The primary effect of Solvency II on the actuarial role is to introduce formal requirements for insurance and reinsurance undertakings to establish an Actuarial Function and a Risk Management Function.

7.1.3.1 Current Situation

Similar to many countries, actuaries fill a wide range of roles within life and non-life insurance companies in Ireland i.e. valuation, reserving, premium setting and product development. However under the current regulatory regime in Ireland, certain actuaries fulfil statutory responsibilities in what are known as “reserved” roles. Here are some examples below:

Appointed Actuary

- The Central Bank of Ireland requires that a life insurance company appoint an Appointed Actuary who is required to conduct an annual investigation into its financial condition and report to the Board and the regulator.
- The Appointed Actuary must be a Fellow of the Society of Actuaries in Ireland and so must be a qualified actuary.
- Within a life insurance company, the Appointed Actuary plays a continuous role in monitoring and reporting on the solvency position of the company. They also assess the financial consequences of management proposals and the potential exposure of the company to the uncertainties of the external environment.

Signing Actuary

- Within a non-life insurance company, the Signing Actuary must provide an annual Statement of Actuarial Opinion (SAO).
- The SAO report should state that the reserves comply with relevant legislation and are greater than the actuary's best estimate of corresponding liabilities.
- Similar to the Appointed Actuary, the Signing Actuary must be a Fellow of the Society of Actuaries in Ireland.
- Unlike the Appointed Actuary, the Signing Actuary provides a point-in-time opinion and it is not a continuous responsibility throughout the year. The ultimate responsibility for setting reserves remains with the Board.

Next we turn to look at the roles of actuaries following the implementation of Solvency II.

7.1.3.2 Actuarial Function

The responsibilities of the Actuarial Function include:

- Coordination and calculation of the Technical Provisions:
 - Setting the methodology and assumptions,
 - Validating data sufficiency and quality,
 - Analysing experience and deviations from Best Estimate assumptions, and
 - Reporting to Board on reliability and adequacy.
- Providing opinions on underwriting and reinsurance arrangements, and
- Contribution towards effective implementation of the risk management system:
 - In the area of risk modelling for calculation of the Solvency Capital Requirement (SCR) and Minimum Capital Requirement (MCR),
 - Assisting Risk Management Function in relation to Internal Model, and
 - Contributing to the Own Risk and Solvency Assessment (ORSA) process.

Many of the Actuarial Function's responsibilities cover tasks that are carried out by actuaries at present. However, unlike the current statutory roles, there is no specific requirement for a qualified actuary to do this role. Instead the Solvency II Directive states that the "Actuarial Function shall be carried out by persons who have knowledge of actuarial and financial mathematics commensurate with the nature, scale and complexity of the business. The persons must also be able to demonstrate their relevant experience with applicable professional and other standards". Nonetheless, the skillset of an actuary lends itself to this role.

7.1.3.3 Risk Management Function

The inclusion of an explicit Risk Management Function under Solvency II highlights the central role risk management should play in insurance companies in the future.

The responsibilities of the Risk Management function include:

- Development of the risk management strategy supported by policies and procedures (in areas such as underwriting, reserving, asset-liability management, investments, and liquidity)
- Measuring, monitoring, and managing risks
- Regularly reporting to management and the Board
- Reviewing the risk management system as part of the feedback loop
- Responsibility for the ORSA process
- Responsibility for the Internal Model, if relevant. This includes responsibility for coordinating calculations, design, documentation and on-going review of the internal model.

The Risk Management function will be headed up by a Chief Risk Officer (CRO).

7.1.3.4 Society of Actuaries in Ireland's Practising Certificate Regime

The Society of Actuaries in Ireland's (Society) Working Party produced a report on the Practising Certificates Scheme. The report proposes there is a need for practising certs to still apply in a Solvency II world. The Society should require members who are Actuarial Function Holders under Solvency II to hold a practising certificate issued by the Society. The Working Party also proposes developing a practising certificate for actuaries who fill the Chief Risk Officer role. However this should take place after the introduction of Solvency II.

7.1.3.5 Skillset Required

It is clear that actuaries possess many of the skills required to carry out the Actuarial Function. In the area of risk management, the Actuarial Profession is currently marketing actuaries as suitable candidates to fill the Chief Risk Officer (CRO) role within the Risk Management Function.

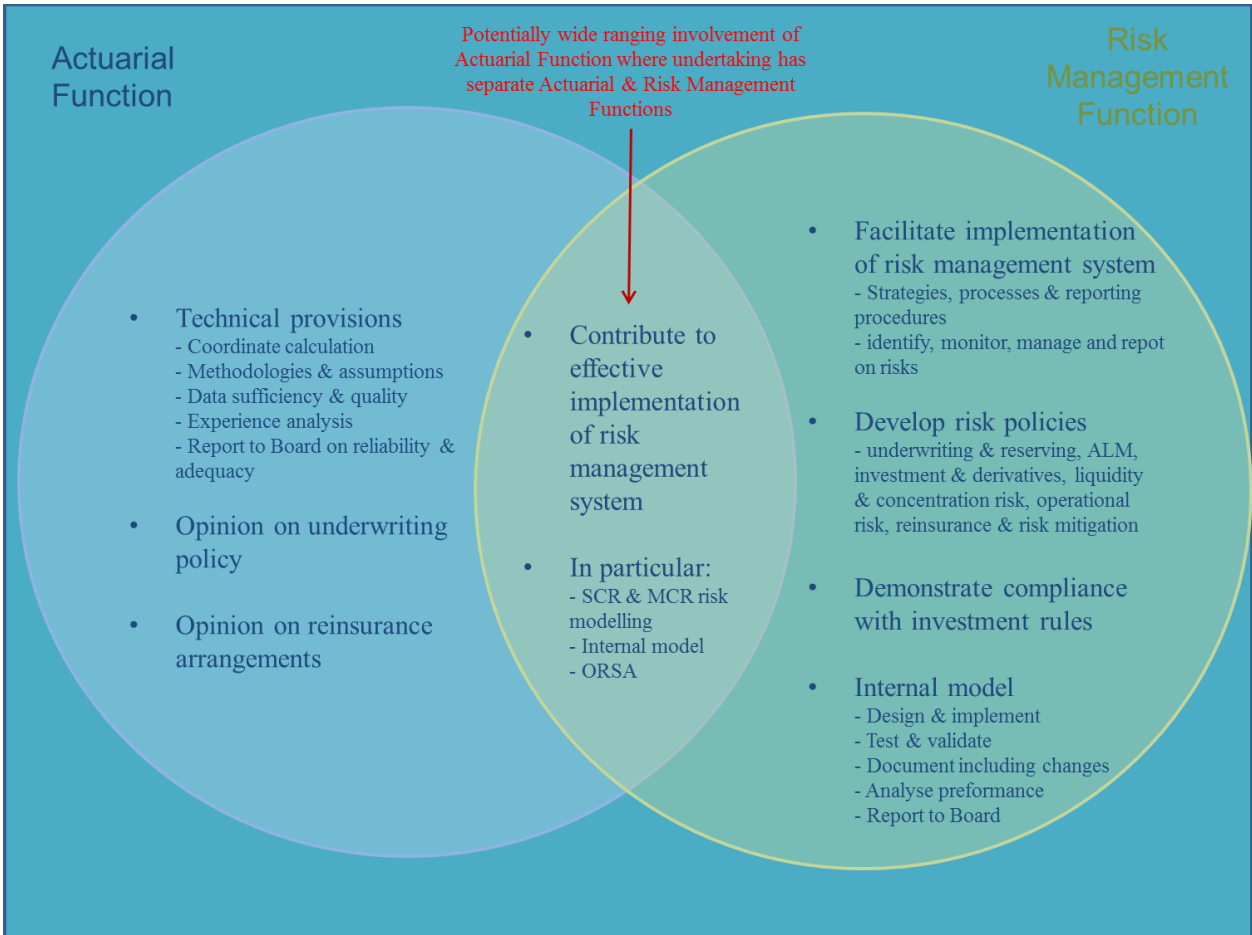
At present, actuaries are recognised as experts in many areas of risk i.e. financial and demographic risks. However for the Risk Management Function, actuaries also need to demonstrate their expertise in Enterprise Risk Management (ERM), considering the risks of an enterprise as a whole. To this end, the Actuarial Profession has introduced:

- The Chartered Enterprise Risk Actuary (CERA) qualification, a globally recognised demonstration of ERM expertise
- The ST9 subject (Enterprise Risk Management) providing candidates with an understanding of the key principles underlying the implementation of ERM

Already, this strategy is meeting with success and many actuaries have been appointed as CROs for leading insurers.

7.1.3.6 Organisational Structure

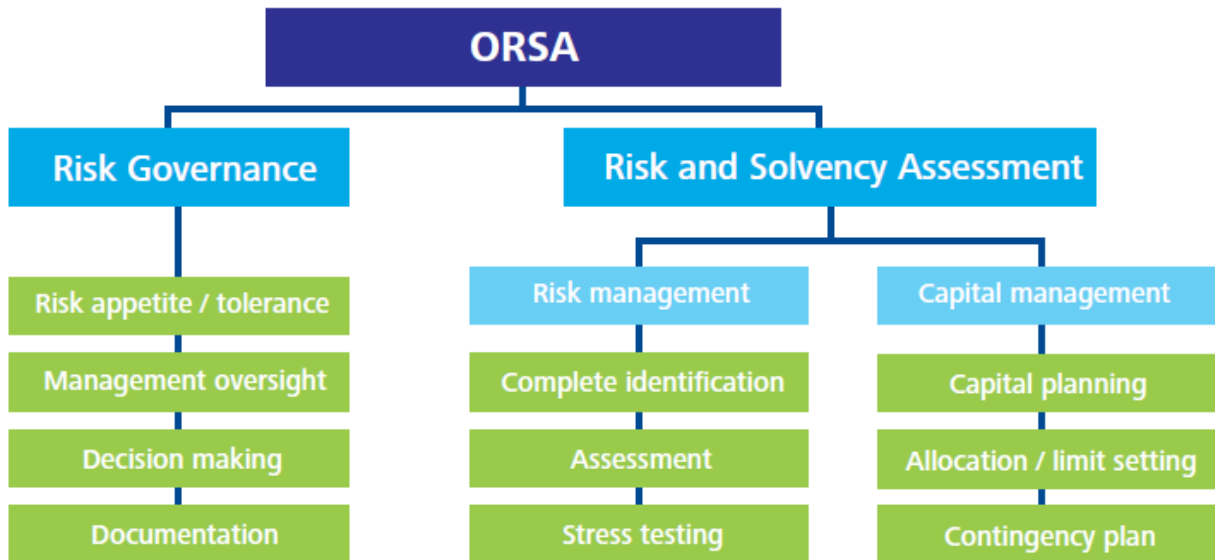
While Solvency II requires two separate functions, it is clear that the Actuarial Function and Risk Management Function will need to work closely together. Solvency II allows for full or partial integration of these functions, depending on the size and complexity of the undertaking. The following diagram summarises the responsibilities of the two functions and the overlap involved:



7.1.4 Own Risk and Solvency Assessment (ORSA)

The Own Risk and Solvency Assessment is a key part of Solvency II. It is required by Pillar II (Supervisory Process). It represents the insurer's own assessment of the capital required to run its business, reflecting the company's risk profile and tolerances. Unlike some of the measures described above, the guidelines for ORSA are almost finalized. Many companies are currently developing the ORSA process at present.

The graph below gives a brief outline of the fundamental elements of an ORSA:



Source: Solvency II How to Conduct an ORSA (Deloitte)

The graph above shows the broad scope of the ORSA, ranging from capital allocation to documentation. EIOPA have issued guidelines on how to implement the ORSA – these are covered below.

7.1.4.1 EIOPA Guidelines on ORSA

In July 2012, EIOPA released its final report on draft Level 3 guidelines for the ORSA.

Some of the highlights of these recent guidelines include:

- EIOPA reiterates that the ORSA is intended to be an on-going process and approach to risk management. It is not simply report that needs to be completed once each year,
- The level of detail in the ORSA should be proportional to the size and level of risk of the business. However, EIOPA has not provided guidelines on how proportionality is determined. Instead, it feels companies should determine the level of proportionality appropriate to their own business,
- The figures derived for the ORSA and the SCR do not need to be based on the same calculation date. i.e. they don't necessarily both have to use 31st December. However, if the company is using different dates, it should ensure that the risk profile of the business has not changed materially,
- EIOPA requires that all risks are quantified, even if some are difficult to quantify. For instance, some Operational Risks such as fraud are difficult to quantify in terms of capital at risk. However where quantification is difficult, a high-level quantification will suffice, and

EIOPA have relaxed the guidelines for forward-looking projections. Companies do not have to calculate their solvency needs for all future years. Instead they must cover their solvency

needs over an appropriate multi-year time horizon. This reduces the complexity of the calculations required.

The Society's ORSA Working Party prepared a paper for companies on how to carry out an ORSA, with a particular focus on life insurers. As well as introducing the basic components of an ORSA, this report also looks at some of the more technical aspects and obstacles when preparing an ORSA. It is a useful resource for companies who are preparing an ORSA for the first time.

One of the key challenges for companies will be embedding the ORSA is daily decision making throughout the organisation. These decisions are made by staff in different roles in the organisation and clear communication of the ORSA process will be crucial.

While there may be some further changes before Solvency II is eventually finalised, EIOPA has strongly encouraged companies to implement the ORSA based on these guidelines. A recent survey by KPMG among insurers in UK and Ireland showed that approximately half of all respondents have already started a full ORSA run (Solvency II: Progress in an uncertain world, KPMG).

SUMMARY

- ❖ The implementation of Solvency II has been delayed, once more. The implementation date is now expected to be 1st January 2015 at the earliest. The current delay is due to a lack of agreement on the final Omnibus II text.
- ❖ One area of debate among the Trialogue centres on an appropriate package of measures for Long-Term Guarantee products. This includes measures such as the Matching Premium, Extrapolated Swap Curve and Counter-Cyclical Premium. An assessment will take place in early 2013 to understand the impact of these measures.
- ❖ The organizational structures of companies under Solvency II will include an Actuarial Function and a Risk Management Function. It is likely that actuaries will work in both functions, although there will no longer be statutory roles for actuaries under Solvency II.
- ❖ The ORSA forms a key part of Solvency II. EIOPA has issued draft Level 3 Guidelines and companies are now starting to embed the ORSA process in their organisations in anticipation of the implementation of Solvency II.

7.2 Possible Consequences of Solvency II

The primary aim of Solvency II is to introduce the requirement for undertakings to hold capital in accordance with their risks. Whether this ultimately reduces the risk of an insurer (or reinsurer) being able to meet its claims is debatable, e.g. an insurer might actually be holding more capital under Solvency I rules than under Solvency II rules and hence is 'safer' at present than it may be under Solvency II. Solvency II also aims to unify the EU insurance market and to enhance consumer protection and confidence – the latter is very timely in the wake of the debt / banking crisis across the world.

The on-going delay, however, in the implementation date (which is looking like as late as 2016) does have a negative impact on the insurance industry. It favours companies that are less prepared for the implementation date and causes a further delay in achieving the positive consequences listed above. The on-going uncertainty of firstly, when a decision on the implementation date will be made (moved from 20th November 2012 to 11th March 2013) and secondly, what date the new implementation date will be (the likelihood will be that it will change from 1st January 2014 to 1st January 2016) has caused huge uncertainty for all stakeholders.

The following section outlines some examples of the possible consequences of implementing Solvency II.

7.2.1 Possible Positive Consequences: Examples

In summary, Solvency II rewards good risk management and should provide better protection for policyholders. It also encourages the implementation of Enterprise Risk Management (ERM). This encourages more cost-effective management and monitoring of risks as well as increased consistency and communication of risks within a company.

If Solvency II is successfully implemented, it could be seen as the model for how an insurance/reinsurance company should be run and governed. It could also be seen as the best model to follow, not just for other insurance jurisdictions but for other industries.

In addition, the potential to increase public trust through the increased level of disclosure required under Solvency II could be a very real benefit. Whilst insurance companies did remain largely unscathed throughout the banking crisis of the past few years, the close relationship between banks and insurers has had a negative impact on the perception of insurers. The full implementation of Solvency II would be a significant signal to the marketplace, and to all potential customers that insurance companies are serious about protecting policyholders' interests. Furthermore, it has the potential to stabilise the broader financial system by showing that a robust regulatory system can be put in place and work effectively for stakeholders.

Under Solvency II, there will also be more emphasis on quantifying risk rather than simply adopting a qualitative approach. The use of the Solvency II framework should help ensure that those involved in the insurance business (from company directors right through to auditors and regulators) have a more detailed understanding of how to monitor and mitigate risk.

Under Solvency II, insurers will be more adequately rewarded for diversifying their risks as well as using risk mitigation tools such as reinsurance as this will reduce in the amount of capital they are required to hold. Companies will also be able to recognise management actions in the valuation of their liabilities. As Solvency II encourages insurers to hold capital at a level broadly commensurate with the underlying risks, post-Solvency II capital will take account of all of the possible risks of e.g. a product (as well as other non-product-related risk exposures), rather than the few simple "rules" that are considered under the current Solvency I regime.

The increased level of disclosure as part of the three pillar approach to Solvency II is also likely to increase transparency across the marketplace. The increased-level of disclosure might also lower the cost of capital for insurers and reinsurers (due to increased transparency of the financial strength of the undertaking).

A fundamental aim of Solvency II is that risk management will be incorporated into the day to day decision-making process of the company. With the integration of the Solvency II processes there can be a lag before this operates efficiently. The ORSA will make sure that the main decision makers in an insurance company are not just well attuned to the quantitative results of a company and the capital needed but the qualitative aspects such as a detailed description of the risks facing the business. However, this may not come about immediately.

Overall, there are many possible positive consequences of the Solvency II framework.

7.2.2 Possible Negative Consequences: Examples

Solvency II encourages insurers to acquire less risky asset classes such as bonds and cash compared with equities. This may cause some insurers to change their investment portfolio dramatically and at a volatile and uncertain time in the markets, this may increase uncertainty. This has already been evident in the market place as there has been an increase in demand for certain type of assets such German government bonds, so much so that yields for certain durations have turned negative. There is also a risk that there is a flight of capital to non-Solvency II regulated areas if increases to capital costs are higher than expected. Some of the other negative consequences include:

- Flight from peripheral EU government bonds,

- Tough competition for EU insurers/reinsurers from non-Solvency II equivalent jurisdictions,
- Difficulty in hedging the Solvency II balance sheet if the risk-free rates moves too far from the market yield curve,
- Risk that because the vast majority of firms will be following the Standard Formula everyone will fail at the same time, or
- Possible discontinuance of some product lines (leading to unfulfilled consumer needs) due to excessive cost of capital.

The introduction of Solvency II has increased demand for limited resources, in particular, Actuarial resources. This has increased the cost of implementing Solvency II at a time when the economic climate is already challenging for insurers. In addition, there is a risk that key resources within the insurance company are taken from day-to-day business activities to Solvency II implementation tasks which may result in too little focus on managing the business. In such a competitive environment and with major changes (such as the gender directive ruling) happening in the short term, this is a difficult balance to achieve.

The link between Solvency II and Basel III (new regulatory regime being introduced for the banking industry provides a very public link between insurance companies and banks – is this something that the insurance industry wants given the current negative perception of banks?

In addition, there is a danger that insurers could find weaknesses in the Solvency II model that they are using and attempt to take advantage of any model weaknesses found. This could result in reduced capital costs without any material change to the level of risk underlying the business. However, the Regulator will pick up on issues of this nature.

In terms of trying to list potential negatives, we need to ask whether Solvency II could appear to be over-reliant on external companies such as credit rating agencies? If so, this could be a challenge to fully ensure transparent results. In the context of the on-going Eurozone debt crisis, some critics have stated that this is not the best time for such large scale changes to insurance companies.

There is potential for Solvency II to increase competition and ultimately result in lower prices for customers. This is rather debatable, however, and the large cost of transitioning to a Solvency II regime will ultimately be passed on to the customer in some form. There will be a particular challenge for small and niche insurers to remain competitive under Solvency II. In addition, the cost of implementing Solvency II will increase entry costs for new insurers and hence reduce new competition.

7.2.3 Other Possible Consequences

Insurers have been faced with the difficult decision of whether to implement the Standard Formula or the Internal Model for the purposes of capital requirement modelling. While the Standard Formula has lower initial costs but potentially higher future capital costs, an Internal Model has higher upfront costs with potentially reduced capital costs in the future. At a time when a number of companies are under considerable budget challenges, this has proved to be a very difficult decision to make. However, many insurers are opting for the Standard Formula. It is debatable whether this is a negative consequence. However, leaving this choice to the insurance companies could lead to inequalities/inconsistencies within the market and could lead to a decision based on short-term costs rather than on what model represents the company best. Another valid point of view is that the possibility of using an internal model is a positive consequence of Solvency II.

There is also the possibility that Solvency II increases mergers and acquisitions as companies in a stronger financial position are able to take control of smaller, more niche operations and can benefit from increased diversification. This would reduce the level of competition in the market. It is also possible to argue that larger companies will be able to pass greater economies of scale to consumers.

7.2.4 Conclusion

To conclude, the implementation of Solvency II will be a major milestone for insurance companies. Predicting how everything will unfold is challenging given the uncertainty around the implementation date. We now await an update from EIOPA in March 2013 on the new implementation date.

SUMMARY

- ❖ Solvency II aims to unify the insurance market in the EU and enhance consumer protection and confidence.
- ❖ It encourages the application of Enterprise Risk Management (ERM). This should result in more consistent management and communication of risks within insurance companies. Insurers are rewarded for diversification of risks as well as using risk mitigation, such as reinsurance.
- ❖ As part of Solvency II Pillar 3, an increased level of disclosure is required. This is likely to increase transparency across the insurance industry in the EU.
- ❖ Due to the proposed Solvency II discount rate structure, insurers may have difficulty hedging the Solvency II balance sheet if the Solvency II risk-free rate moves too far from the market yield curve.

7.3 Gender Directive

7.3.1 What is the Gender Directive?

The EU adopted the Gender Non-Employment Directive in December 2004. This Directive prohibited discrimination on the basis of gender in the provision of goods and services. This included the provision of insurance and related financial services.

Article 5.1 of the Directive prohibited the use of gender as a factor in the calculation of insurance premiums and benefits, but, Article 5.2 contained an exemption which enabled member states to permit differences in insurance premiums and benefits on the basis of gender where justified by “relevant and accurate actuarial and statistical data”.

Since the Directive was first implemented, Ireland had availed of the exemption in Article 5.2 and insurance premiums and benefits were still offered using sex as a rating factor.

In fact, all 26 EU countries availed of the exemption in some shape or form. 13 countries, including Ireland and the UK, used the exemption for all types of insurance. Other countries applied the exemption selectively, for example Belgium allowed it for life contracts/annuities only.

7.3.2 Test Achats and the European Court of Justice (ECJ)

The Association Belge des Consommateurs Test Achats ASBL, or “Test Achats” as they are more commonly known, took a case to the European Court of Justice (ECJ) in relation to the Gender Directive. Test Achats challenged whether the exemption in Article 5.2 was acceptable, given that the prohibition of discrimination on the grounds of gender is enshrined as a fundamental right of the EU.

The ECJ ruled that Article 5.2 is invalid, but granted a temporary period of relief to allow time for implementation. We are currently within that implementation period, and, by 21st December 2012, insurers will no longer be able to offer premiums and benefits (to individuals) using sex as a rating factor.

The European Commission published guidelines in December 2011 detailing how the ruling should be implemented into law.

7.3.3 Implications for the Life Industry

7.3.3.1 EC Guidelines

New contracts which are sold post 21st December 2012 (known within the insurance industry as “G-Day”) must be consistent with the ruling and are required to be sold on a gender neutral basis.

For the purposes of compliance with the ruling, new contracts can be defined as:

- contracts concluded for the first time as from 21st December 2012. Therefore, offers made before 21st December 2012 but accepted as from that date will need to comply with the unisex rule,
- agreements between parties, concluded as from 21st December 2012, to extend contracts concluded before that date which would otherwise have expired.

Article 5.1 prohibits any result whereby differences arise in an individual’s benefits and premiums as a result of the use of gender in the calculation of those benefits and premiums. However, it does not prohibit the use of gender as a *risk rating* factor in general. Note that employer-related business is unaffected by the ruling.

The EC guidelines specifically state that “Such use is allowed in the calculation of premiums and benefits at an aggregate level, as long as it does not lead to differentiation at an individual level. After the Test Achats ruling, it therefore remains possible to collect, store and use gender status or gender related information within those limits.” The guidelines then specifically go on to state that use of gender is still permissible for reserving and internal pricing, reinsurance pricing, marketing, advertising and life and health underwriting.

The key point in the above is that the final price offered to an individual consumer must not be affected by that consumer’s gender.

7.3.3.2 Products Affected

The directive itself only applies to insurance and pensions which are private, voluntary and separate from the employment relationship; employment and occupation related benefits are explicitly excluded from its scope. This means that employer related business (including group health, group life, accident cover and annuity purchase by pension schemes) is unaffected.

Any products which are sold to individual consumers will be affected by the ruling.

The impact on life insurance prices can be summarised as follows:

Product	Indicative Pricing Changes Post G-Day
Life Cover	Unisex –moderate increase in female rates, small reduction in male rates
Specified Illness	Unisex – younger lives: moderate increase in male rates, small decrease in female rates – older lives: moderate increase in female rates, small decrease in male rates
Income Protection	Unisex – substantial increase in male rates, moderate reduction in female rates
Annuities (personal)	Unisex –small increase in female pension income, small reduction in male pension income
Annuities (employer purchased)	Unaffected, rates remain gender differentiated

Within each of the above, prices are likely to be closer to the higher of the pre-directive male and female rates. This is to reflect the increased uncertainty that companies will face when selling business. This means that price movements are not likely to be of the same magnitude for each gender, and the impact of the directive will not be the same for each gender.

The above table aims to capture the key movements that consumers may face, but it is by no means definitive. The actual pricing structures that will be adopted by companies will depend upon the pricing strategies they adopt, so there could be significant variance when the directive is first introduced.

It is also worth noting that, at the time of writing, there is some uncertainty about the definition of “employer-related” business for annuities. Until “G-Day” itself, we will not know how different companies will interpret this, but it appears that some are viewing Defined Contribution schemes as in scope, while some view them as out of scope.

7.3.3.3 Product Pricing

In the run up to, and post, “G-Day”, companies will need to have unisex rates available to price products. The pricing strategy adopted will need to be structured in such a way as to minimise the potential loss of profit margins or market share, but also to attract more “low risk” business (by “low-risk” here, it is meant that the company may seek to have a larger proportion of the gender which it perceives to pose a lower risk of claiming for the particular product type sold).

The manner in which products are priced varies, and the methodology adopted will have an impact on the final price. By the time this paper is published, the majority of insurers will have decided on their pricing structures and chosen strategy. However, it is worth considering a simple example to highlight some of the issues facing insurance companies.

A Simple Example

A 50 year old is seeking cover for one year against a particular illness. The likelihood of this illness occurring is 5% for males and 2% for females (both aged 50). The sum assured is €5,000. Assume joint life tables do not exist for this benefit and there are no loadings for profit or expenses.

The pure risk premium for a male (to cover expected claims with no profit loading) would be $5\% \times 5000 = €250$; the female risk premium would be $€100$ ($2\% \times 5000$).

Now, if gender cannot be used as a rating factor, assumptions must be made about the potential customer:

- **assume male** – charge €250 per person. Not likely to win the business if a competitor quotes a lower premium. The risk here is that new business levels and market share fall.
- **assume female** – charge €100 per person. The risk here is that competitors charge more and the company wins the business, but the actual mix of business sold includes male customers. Hence the price charged does not cover the risk involved.
- **assume a proportion are male and a proportion are female** - again, if the company assumes a higher proportion of male lives than competitors they will lose the business, but if they assume a higher proportion of female lives then they will win the business but may under-price the actual risk taken on.

What this simple example shows is that having prices marginally lower or higher than competitors could result in an individual insurance company winning/losing business. However, the risk is that the price charged will not accurately reflect the risk taken on. What could potentially happen is that one insurer sets a market price that wins more business, and other companies drop their rates to compete. The danger is that the market adopts an equilibrium price which is not reflective of the overall risk level that is being taken on, and so all insurers are impacted adversely. While this equilibrium would be unsustainable in the long term, it could still lead to insurers sustaining short term losses.

The mix of gender across a book of business will still be an indicator as to the overall level of risk exposure. As a result, companies will need to carefully monitor their risk profile and pricing strategies post implementation. In particular, prices may be particularly volatile in Q1 2013 as companies react to the market environment and their competitive position.

Existing business will also need to be monitored – there is a risk that policyholders may seek to lapse existing contracts and take out new ones in the hopes of acquiring more favourable rates. For example, male policyholders with life cover may find that it is cheaper to lapse their current policy and take out a new policy. It is difficult to identify if customers will try to do this, but the behaviour could be encouraged by intermediaries who profit from commission payments on new policies. This risk could be managed by trying to incentivise existing customers to stay. Many companies now offer persistency bonuses to sales agents – this could be used as an additional tool to manage this risk.

7.3.4 Implications for General Insurance Pricing

Many of the implications of the Gender Directive from a general insurance pricing perspective are quite similar to those expected on the life side as set out above. The prices for males are expected to reduce and female prices are expected to increase. It is also the case that monitoring of one's business mix in a world of cross-subsidisation becomes of paramount importance.

What will be more interesting will be witnessing the varied strategies employed by general insurance companies to gain an advantage over their competitors in an uncertain gender neutral world. There has been speculation that the overall level of rates may rise as a result of the gender directive. This could be as a result of insurers adding margins to their prices to allow for the added uncertainty or perhaps for the additional expense of preparing for the gender directive in the first place. Will insurers employ innovative techniques to attract "overpriced females" on their books, be that through branding or advertising?

In Ireland, legal restrictions make it difficult for insurers to fully understand the prices being charged by competitors. Game theory is sure to be at play from 21st December onwards, with the success of an insurer's strategy completely contingent on the actions of their competitors, actions which are often quite difficult to fully figure out!

7.3.5 Future Developments

An Age and Disability Directive is currently being drafted (disability is understood to mean "health status" from an insurance perspective). Ideally from an insurance perspective, the Directive will be drafted to ensure that:

- Insurers can continue to use age and health status as rating factors when pricing and underwriting risks, as these have a much more significant impact on pricing than gender, and
- Test Achats and other consumer groups would not be in a position to challenge the implementation of the Directive.

The Insurance industry plays a significant role in adding value to the European economy, and if the industry was unable to make use of such rating factors, it would have a serious impact on the industry as we know it. In effect, community rating would apply.

Community Rating is a system whereby the same premium is charged to everyone for the same cover, regardless of age, gender, health status etc.

It does already exist in some markets, for example the health insurance market in Ireland is community-rated. It can work in some cases, in particular where selection against the provider is difficult. However, it is not without problems (as can be seen from the historic health insurance issues in Ireland). For life and general insurance, it could potentially lead to the case where premiums rise to such a level that most people are excluded from the market, effectively negating any economic benefit that is generated by the Industry.

SUMMARY

- ❖ The Gender Directive ruling comes into effect from 21st December 2012.
- ❖ After this date, all new business sold to individuals will have to be issued on gender neutral rates.
- ❖ It could happen that additional restrictions may be applied to other risk/rating factors, however it is hoped that the EU directive that covers this will continue to permit the use of such factors.

7.4 Enterprise Risk Management

7.4.1 Introduction

Enterprise Risk Management (ERM) has come to prominence in recent years as a result of numerous high-profile company failures both during and before the global recession. It cannot be denied that embedding the principles of ERM into the culture of an organisation acts as a ballast in times of financial turbulence, and the role of the ERM actuary is likely to become increasingly important in future years as a result.

There are many accepted definitions of ERM, but one of the simplest and most accessible is that it is:

- the analysis, identification, assessment, evaluation and management of all risks (both upside and downside) consistently across an organisation, such that the risk appetite of the organisation is not breached.

This is broader than traditional risk management, under which risks are often managed within each business unit using a piecemeal, or “silo-based”, approach. Under an ERM framework, risks are managed across the organisation in such a way that the links and interdependencies between the various risks are recognised and allowed for.

Such an approach has clear parallels with the Solvency II regime, under which a transparent and holistic risk management system applied consistently across the enterprise is required. The principles of ERM can be extremely effective when producing a firm’s risk appetite statement and when establishing the Own Risk and Solvency Assessment (ORSA) process, as will be referred to again later in this section. In addition, it should be noted that ERM has a clear focus on viewing risk as an opportunity (e.g. taking on the “upside” risks) rather than solely on avoiding or limiting exposure to the downside risks.

7.4.2 ERM as a Rating Tool

Since 2005, the rating agency Standard and Poor’s has used ERM as a criterion when assessing the credit rating to be applied to an insurance company. This change has come about due to increased recognition of the central role that risk management plays in insurance business activities.

The other criteria which contribute to the overall rating awarded to the insurer are:

- competitive position,
- management and corporate strategy,
- operating performance,
- capitalisation,
- liquidity,
- investments, and

- financial flexibility.

Performance in the ERM arena is, similarly to the other criteria listed above, assessed as being weak, adequate, strong or excellent for each insurer. The ERM evaluation criteria that are used in the assessment include:

- risk management culture,
- risk control,
- extreme event management,
- strategic risk management, and
- risk and economic capital models.

Insurance companies have been subject to considerably greater losses during the global financial crisis than would have been expected, and Standard and Poor's attributes this to:

- poorly designed processes,
- poor implementation of well-designed processes,
- lack of organisational commitments to properly enforce limits and align activities with risk management objectives,
- lack of ability to properly execute the ERM framework in place, and
- weaknesses in insurers' risk appetite frameworks with lack of understanding of specified risk tolerances and lack of ability to reconcile risk limits and risk tolerances (e.g. complex variable annuities and credit products).

These shortcomings would be addressed under a robust and well-functioning ERM framework, and this gives greater urgency to the need to establish such frameworks on a widespread basis. The ERM evaluation criteria used by Standard and Poor's do, of course, take account of the complexity of a firm's risk profile, as firms with more complex risks will, as a rule, require a more sophisticated approach to ERM than firms that have simpler risk exposures.

7.4.3 Links to the Solvency II Framework

As has already been described in this paper, Solvency II continues to be a key focus for many actuaries in Ireland and abroad. ERM provides a natural solution to many of the questions that arise under the EIOPA framework, as the principles of holistic risk management and strong corporate governance are set to play a major role within the Solvency II regime.

The key benefits that the Solvency II framework aims to bring about are as follows:

- The holding of capital to protect against market risk, credit risk and operational risk,
- Risk-based solvency requirements to be enforced across all EU member states,
- A prospective approach to risk management,
- Adaptation of capital requirements to the needs of groups as distinct from solo entities,
- Allowing for the asset side of the balance sheet as well as the liability side, along with the interactions between them, and

- Embedding a strong risk culture across the organisation (as prescribed by the ORSA) rather than relying solely on capital to mitigate against the risk of failure.

All of the above objectives have much in common with the tenets of ERM and, as such, the significance of ERM within the Solvency II regime cannot be over-stated.

One of the more practical and current applications of the ORSA (and, by extension, ERM) within insurance companies is the formulation of risk appetite statements. At Board level, companies must define the types and levels of risk that they are willing to accept in pursuit of their growth objectives. These definitions may be expressed in terms of credit rating, solvency level, earnings or other such suitable metrics.

The high-level risk appetite statement must then be translated into a set of more detailed and easily-measurable risk tolerances and risk limits which apply uniformly across the organisation. Risk tolerances and risk limits should set clear thresholds for each individual risk category, e.g. credit rating for reinsurance-related risks, performance against liquidity benchmarks for liquidity risk, customer complaints for operational risk, and so on.

Aside from complying with the ORSA regime and keeping the overall risk of the organisation within acceptable limits, one of the key uses of the risk appetite framework is the assessment of whether or not new projects should go ahead. Subject to the availability of reliable risk information, a project manager can evaluate the riskiness of the proposed project relative to the overall risk appetite of the firm and, thereby, provide a clear and transparent justification for proceeding (or not) with the project.

7.4.4 ERM and the Actuary

The Chartered Enterprise Risk Actuary (CERA) credential is one of the most widely-recognised and highly sought-after qualifications that an actuary can obtain in the field of ERM. The 1000th CERA qualification has recently been awarded globally, and the level of uptake among students from the UK and the Republic of Ireland is high. (At the time of writing of this paper, there are approximately 20 actuaries with the CERA qualification in the Republic of Ireland.) It will be important to continue to encourage students to apply to sit the Profession's ST9 examination in order to achieve exemptions from the CERA examination, so that actuaries can be suitably qualified to use our unique skill set in order to lead development within the fast-growing area of ERM.

Well-regarded alternatives to the CERA qualification exist for students who do not wish to pursue the ST9 route, and more detailed information may be found about these online or by contacting the relevant bodies directly. Such alternatives include:

- university qualifications, e.g. the Executive Masters in Risk Management offered by UCD and the Institute of Bankers,
- the international “PRM (Professional Risk Manager)” credential offered by the Professional Risk Managers’ International Association (PRMIA), and
- qualifications and courses offered by the global Institute of Risk Management (IRM), which has links to the UK-based Association of Insurance and Risk Managers in Industry and Commerce (AIRMIC).

SUMMARY

- ❖ ERM is the analysis, identification, assessment, evaluation and management of all risks (both upside and downside) consistently across an organisation such that the risk appetite of the organisation is not breached.
- ❖ Since 2005, Standard and Poor’s has used ERM as a criterion when assessing the credit rating to be applied to an insurance company. ERM capability is evaluated under the following headings: risk management culture, risk control, extreme event management, strategic risk management and risk and economic capital models.
- ❖ The objectives of ERM are strongly aligned with the objectives of Solvency II, especially as part of the ORSA. Risk appetite statements compiled by the Board, risk tolerances and risk limits are of key importance under Solvency II.
- ❖ The 1000th CERA qualification has recently been awarded globally, and actuarial students can gain exemptions from it by sitting the Profession’s ST9 examination. Other highly-regarded risk management qualifications may, however, be pursued as an alternative to ST9.

8 Appendix A – EFSM, EFSF, ESM & the Fiscal Stability Treaty

8.1 EFSM, EFSF and ESM – what are they?

Throughout the financial press over the last few years, the EFSM, EFSF and ESM have been mentioned frequently.

These bodies were established as part of the European Union’s response to the financial crisis. This section aims to explain what the purpose of each of these bodies is and how they relate to each other.

“**EFSM**” refers to the European Financial Stabilisation Mechanism.

“**EFSF**” refers to the European Financial Stability Facility.

“**ESM**” refers to the European Stability Mechanism.

8.1.1 EFSM

The European Financial Stabilisation Mechanism (sometimes referred to as “stability mechanism” instead) is one of the methods that the European Commission established to provide financial assistance to EU member states in financial difficulties.

The EFSM was established in May 2010.

Under the EFSM, the European Commission was permitted to issue bonds on the markets, up to the value of €60bn. The Commission then on-lends the funds to the particular member state in need of assistance. All interest, and the loan principal, is repaid by the member state who received the funds raised, via the EC. The EU budget guarantees the repayment of the bonds in the case of default by the borrower.

To date, the EFSM has been activated for Ireland and Portugal. The total amount raised by the EFSM was €48.5bn - €22.5bn and €26bn for Ireland and Portugal respectively. Within the bailout programmes for Ireland and Portugal, the EFSF and IMF also contributed funds.

The EFSM was set up to work in conjunction with the EFSF.

8.1.2 EFSF

The European Financial Stability Facility is another one of the methods established to provide financial assistance to EU member states in financial difficulties.

It too was established in May 2010.

In order to fulfil its mission, the EFSF is authorised to:

- Issue bonds or other debt instruments on the markets to raise the funds needed to provide loans to countries in financial difficulties,
- Intervene in the primary debt market,
- Intervene in the secondary debt markets,
- Act on the basis of a precautionary programme, and
- Finance recapitalisations of financial institutions through loans to governments including in non-programme countries. (Non-programme countries are those that have not entered into formal bailout programmes.)

So, the EFSF is similar to the EFSM in that it issues bonds or other debt instruments on the capital markets.

However, unlike the EFSM, the debt that is issued by the EFSF is not guaranteed by the EU budget, but by guarantee commitments from the individual member states. At present, the EFSF is backed by guarantee commitments from Euro area member states to the value of €780bn, while it has a lending capacity of €440bn.

The EFSF has a rating of Aaa from Moody's, AAA from Fitch Ratings and AA+ from Standard and Poor's (S&P). S&P had initially rated the EFSF at AAA, but downgraded it to AA+ in January 2012 following the downgrade of France and Austria; S&P felt there were not enough AAA-rated guarantors for the fund to maintain a rating of AAA.

The EFSF has been involved in the bailouts for Greece, Ireland, Portugal and the Spanish bank bailout.

8.1.3 ESM

The European Stability Mechanism is a Luxembourg-based international financial institution, which merges the functions of the EFSF and the EFSM into one body.

As with the EFSF and EFSM, the ESM provides financial assistance to EU member states in need of it. Any Euro-area member state receiving assistance will be required to implement a macro-economic adjustment programme and a rigorous analysis of public-debt sustainability. The ESM is permitted to purchase bonds issued by an ESM member on the primary market if this maximises the cost efficiency of the financial assistance.

The ESM's maximum initial lending volume, after the EFSF has been fully wound down, is set at €500bn. Its capital stock of €700bn will ensure that lending can be made up to this amount; the €700bn consists of €80bn in paid-in shares and €620bn in callable shares.

The ESM itself is established by an inter-governmental treaty, and it could only be set-up when this treaty was ratified by the member states that will be contributing to it. To be ratified, it required the approval of signatories representing no less than 90% of the total subscriptions.

The ESM was inaugurated in October 2012.

The treaty establishing the ESM itself contains a provision that only countries who have ratified the separate Fiscal Treaty (discussed below) can obtain funding from the ESM.

ESM: Capital Contributions from Member States

Country	ESM Key (%)	Capital subscription (€ bn)	Paid-in capital (€ bn)
Austria	2.783	19.48	2.22
Belgium	3.477	24.34	2.77
Cyprus	0.196	1.37	0.16
Estonia	0.186	1.3	0.15
Finland	1.797	12.58	1.43
France	20.386	142.7	16.31
Germany	27.146	190.02	21.72
Greece	2.817	19.71	2.25
Ireland	1.592	11.14	1.27
Italy	17.914	125.39	14.33
Luxembourg	0.25	1.75	0.2
Malta	0.073	0.51	0.06
Netherlands	5.717	40.02	4.57
Portugal	2.509	17.56	2
Slovakia	0.824	5.77	0.66
Slovenia	0.428	2.99	0.34
Spain	11.904	83.32	9.52
Total	100	700	80

EFSM, EFSF, ESM – summary of key differences			
Acronym:	EFSM	EFSF	ESM
Full name:	European Financial Stabilisation Mechanism	European Financial Stability Facility	European Stability Mechanism
Established	May 2010	May 2010	October 2012
Maximum lending:	€60bn	€440bn	€500bn
Guaranteed by:	EU budget	Guarantee Commitments from member states	Guarantee Commitments from member states
Actions permitted:	Issue debt then on-lend funds raised as necessary.	<ul style="list-style-type: none"> •Issue bonds on markets •Intervene in secondary/primary markets •Act on a precautionary basis •Finance recapitalisations of financial institutions through government loans, including in non-programme countries 	Merges roles of both EFSM and EFSF, so functions as both.

8.2 Fiscal Stability Treaty

The Fiscal Stability Treaty or “Treaty on Stability, Coordination and Governance in the Economic and Monetary Union” to use its full name, was debated at great length in Ireland prior to the referendum which took place here in May 2012.

The purpose of this section of the paper is to summarise the role of this treaty and how it fits into Europe’s response to the sovereign debt crisis.

8.2.1 Treaty Aims

The treaty itself aims to strengthen the existing economic and monetary union by adopting rules which aim to improve budgetary discipline and to strengthen co-ordination of economic policies.

8.2.2 How the Treaty proposes to achieve these aims

The rules established by the Maastricht Treaty were that a government could not run a deficit of more than 3% of GDP. A deficit was defined within the Maastricht treaty as “net borrowing as defined in the European System of Integrated Economic Accounts”.

The Maastricht treaty also specified that the ratio of outstanding debt to GDP should not exceed 60%.

Although these rules were already in existence prior to the commencement of the existing crisis, they were not strictly enforced.

The Fiscal Treaty revises the deficit as a percentage of GDP downwards, from 3% of GDP to a maximum *structural deficit* of 0.5% of GDP.

Note that a structural deficit is a deficit which still exists in an economy even when that economy is operating at full capacity. This differs from a cyclical deficit, which is a deficit that arises because a country is in a downward-trending stage of the business cycle. A requirement based on a structural deficit allows for an element of smoothing over time.

Countries with levels of debt in excess of 60% of GDP will be required to reduce the excess debt level by one-twentieth per year. For example, if a country's debt to GDP was 100%, it would have to reduce the excess amount (40%) by one twentieth in the first year (i.e. decrease the excess amount to 38% and the overall debt to GDP ratio to 98%).

The Fiscal Treaty sees a strengthening in existing measures that encourage compliance with the rules enshrined in the treaty.

8.2.3 Implications for Ireland of passing the treaty

Prior to the referendum taking place, it was made clear that future bailout funds would only be made available to countries which had agreed to the treaty. So, one of biggest implications for Ireland is that, we will not have to overcome the hurdle of not being part of this group.

In addition, Ireland will have to further reduce the structural deficit to 0.5% - as Ireland is currently in a bailout program, we will have until 2019 to do this.

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