Cass Business School – MSc in Actuarial Management

SOLVENCY II – IS IT A PANACEA?

Prepared by Gaurang Mehta on 30/07/2010

Student # 080036343

Project Supervisor:

Dr Jaap Spreeuw

Senior Lecturer in Actuarial Science

Cass Business School

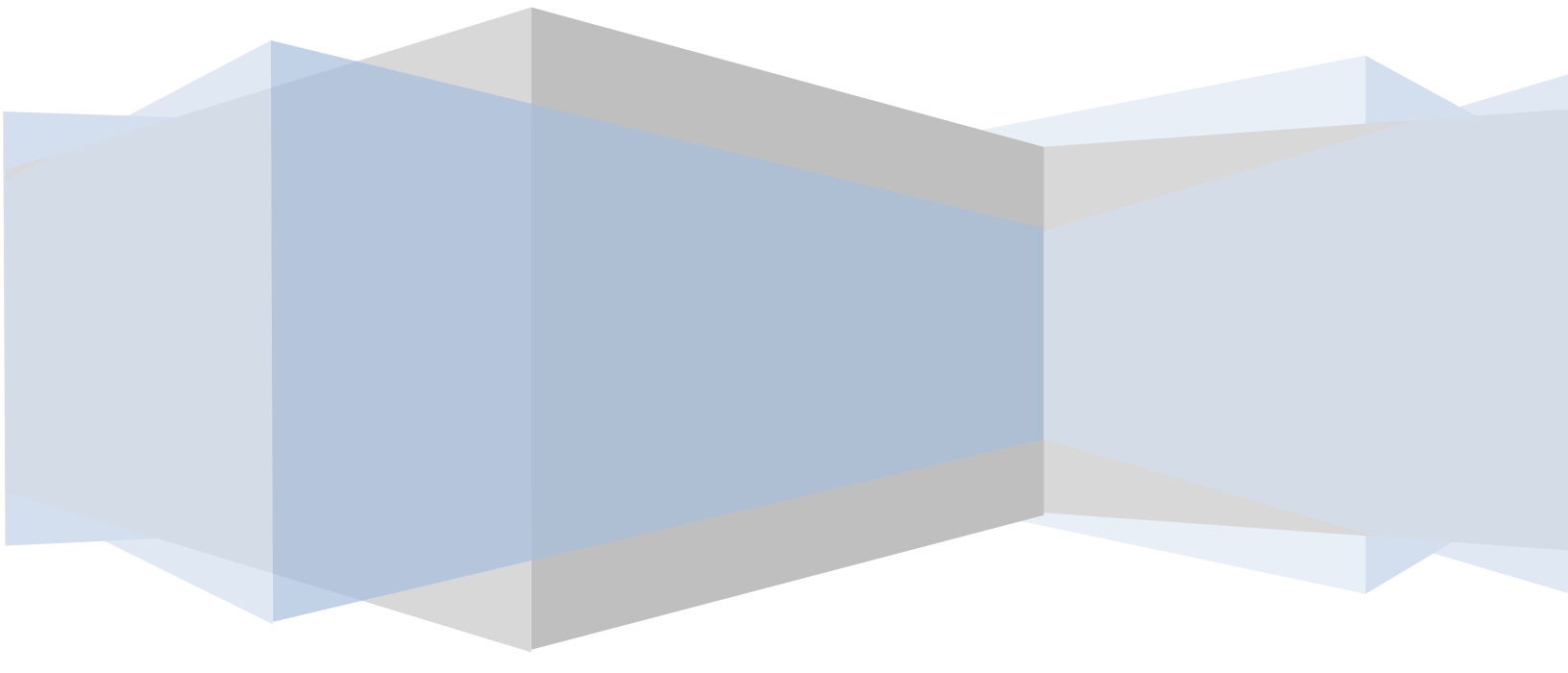

Table of Contents

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Abstract

"Solvency II – Is it a panacea?" is aimed at objective analysis of proposed directive, "Solvency II" in European Union and aims toward critical analysis of the potential advantages and possible challenges posed by Solvency II in its current form. The project draws its main focus from the guidelines published by CEIOPS[1], FSA[2], CEA[3], QIS 5[4] (draft) and prepared questionnaire responses by Solvency II experts from EU member states mainly UK & France. The dissertation focuses on mainly 9 significant issues identified which have a potential impact the insurance industry by implementation of the directive. The responses on the prepared questionnaire are taken from Solvency II experts. The dissertation is a step closure to weighing the marginal benefits of the regulation along with its marginal costs. It wraps ups with some broad recommendations on possible solutions or approaches that can be adopted by EU regulators to resolve such challenges of the directive for its true triumph in insurance regulation.

[1] Committee of European Insurance and Occupational Pensions Supervisors

[2] Financial Services Authority, UK's regulatory body

[3] CEA is the European insurance and reinsurance federation

[4] Quantitative Impact Study 5

Executive Summary

Solvency II

Solvency II is a fundamental review of the capital adequacy regime for European insurers and reinsurers, planned to take effect from January 2013. The current EU Solvency I regime is considered to have simplistic capital requirements those are not fully representative of the underlying risks faced by the insurers. On the other hand Solvency II is based on economic principles for the measurement of assets and liabilities, risk-based capital requirements based on market consistent scenarios (I.e. scenarios under which the valuation of assets and liabilities can be directly verified from the observable market prices) and realistic scenarios (I.e. scenarios under which the valuation is based on futuristic assumptions). The new regime is expected to apply to all insurance firms with gross premium income exceeding EUR5m or gross technical provisions in excess of EUR25m.

Key Elements of the Solvency II regime

Solvency II consists of three main thematic areas, or 'pillars', which are designed to be mutually reinforcing.

- Pillar 1: Demonstration of adequate financial resources consists of the quantitative requirements (i.e. how much financial resource an insurer should hold to be considered solvent)

- Pillar 2: Systems of governance consists of qualitative requirements for the governance and risk management of insurers, as well as for the effective supervision of insurers

- Pillar 3: Disclosure consists of requirements on supervisory reporting and transparency.

Potential advantages of Solvency II

Solvency II is expected to provide market with

1. Transparency – i.e. a uniform and enhanced level of policyholders' protection across the EU, reducing the likelihood that policyholders lose out if insurers get into difficulties by increasing transparency into the businesses. Greater transparency will give policyholders greater confidence in the products of insurers.

2. Consistency – i.e. Solvency II aims to achieve consistency is regulation of insurance industry across all member states by ensuring all member states follow the one directive and do not add any gold plating (i.e. additional) provisions in their territory. The most significant improvement of Solvency I is the introduction of market consistent model instead of subjective discounted cash flow model.

3. Discipline – i.e. Solvency II is not about increasing overall capital levels, but it is about ensuring high standards in the business performance. Solvency II is a

massive project at introducing and developing a risk oriented supervisory culture for insurers amongst the decision makers.

4. Early Warning Signals – Solvency II has introduced of two capital requirements namely SCR (Solvency Capital Requirement) and MCR (Minimum Capital Requirement). E.g. A breach of the SCR would require regulatory intervention but the company would remain solvent. If the available capital lies between the SCR and the MCR, this is an early indicator to the supervisor and the company that action needs to be taken. Breach of MCR would tantamount to insolvency and automatic withdrawal of the supervisor's authorisation to perform business.

Complex issues with Solvency II

In spite of being highly venerable goals of Solvency II, it has some major theoretical and practical limitations in its present form and application.

- Exclusion of Occupational Pension Funds: Solvency II does not apply to occupational pension funds. At present in EU occupational pension funds and life insurers are pension providers. Occupational pension funds are not part of Solvency II exercise but life insurers are compulsorily part of it. This has potential of inducing an imbalance in the capital requirements for solvency & hence level of protection offered to recipients within the same industry making EU a non level playing field for similar product providers.

- Capital Savings: Capital savings are mainly to be found in the life insurance whilst in the non-life insurance sector the capital requirement is going to increase significantly. The reasoning given is due to lower risks linked to life insurance and there is an opportunity for participation in the profit/loss for the policyholders at least for with-profits or other savings contracts. In reality policy holders do share losses or not is a debatable issue and hence, there is a question of unfair distribution of capital requirements within the insurance sector.

- Market Establish Controls: Latest Committee of European Insurance and Occupational Pensions Supervisors (CEIOPS) recommendations have been construed as building up "Prudence on top of prudence" has potential of vanishing markets' self established controls which may lead of false sense of security to policyholders and may also lead to unnecessary consolidation in the market.

- Over Reliance on Value at Risk (VaR): Under Solvency II solvency capital requirement shall be calibrated correspond to the value-at-risk of own funds of the undertaking subject to a confidence level of 99.5 % over a one-year period. Value at Risk (VaR) as a risk measure is more appropriate for liabilities of short term in nature and not for long term liabilities. Also, it has some serious theoretical limitations E.g. once the loss event occurs it does not measure the amount of loss that may occur under a particular loss event, and aggregate result of non normal probability distributions is significantly poor.

- Stability Issues with SCR Aggregation formula: One of the two main methods of calculating Solvency Capital Requirement (SCR) under Solvency II is using a standard formula approach prescribed by the directive. This approach involves aggregation of risks using a correlation based square root formulae as the final step. Due to the nature of the square root function and limitation of correlation as measuring only the linear dependency between risks the resulting aggregated risk is either over or under estimation of true risks when distributions involved are non normal.

- Limitation on use Expert Judgments: Expert judgment is of tremendous importance for many actuarial calculations E.g. Curve fitting process. It is even more important when data set is limited or nonexistent and hence, in real life actuarial work expert judgement is frequently sought due to limitation of the data. CEIOPS's current advice suggests expert judgment being only admissible if derived based on scientific method, should have known potential error rate and validated. Practically the error rate of expert judgement cannot be consistent or unique and may not be based on any scientifically proven methods.

- Extreme Engineering: The regulators across EU expect the firms to use the enterprise wise model built under the Solvency II in the decision making processes. EU regulators are aiming to achieve too many futuristic objectives with such a single enterprise wide initiative and chances of it failing as a tool of overall risk management are very high. The main reasons behind its possible failure are sheer size of the models; complexity and costs involved in building, maintaining and using such models is too high for companies.

Possible Implications of Solvency II Limitations

The conservative approach of building "Prudence on top of Prudence" will force increased capital requirements insurance industry and, eventually, will foster organisational behaviour which may not be in the best interests of policyholders.

- Profitability optimization: Under Solvency II insurers may initially try to minimize the reduction in profitability by reducing the cost of the capital required. If it is possible then each insurer would embark on it anyway, independent of Solvency II in order to improve the surplus to the benefit of either its stakeholders. However, there exists no evidence of any direct relation of inflated capital requirements and higher optimization efforts for increasing or maintaining profitability.

- Transfer of Extra Capital: Insurers would seek to transfer the higher capital requirements to new "risk owners" (E.g. Overseas equity holders) by exploiting any market-based solution or regulatory arbitrage. In spite of being economically viable, such activities would have the inevitable effect of reducing the absolute level of industry profitability and, therefore, reducing the attractiveness of the industry to new investors.

- Conservative Policy Design: Stricter norms on capital requirements will force insurer to reduce product benefits and features. Coverage of policies might

be reduced to set up capital-intensive elements of insurance products. Guarantees could be reduced to minimize mismatching of risks or hedging costs. The companies may increase deductibles or may reduce the policy limits leaving policyholders with higher risks. Increased cost of insurance directly or indirectly may leave the neediest people not being able to afford it and it may cause damaging impacts on to the society by compelling policyholders to retain more of the capital-intense risks that used to be covered earlier.

Conclusion

Solvency II needs to have marginal benefit outweighing its marginal costs to be successful as robust & vibrant insurance regulation. The Solvency II directive is the first constructive step towards coherent risk management framework but it is not a panacea at least in its current form. There is also a potential risk that the Solvency II will make industry more capital intensive and cost of insurance will increase at least in the foreseeable future. The directive needs amendments in its applicability to firms, choice of risk measures, method of assigning values to variables and overly conservative capital requirements. The guideline also needs to be less dogmatic as the regulation aims to be a principal based regulation and not prescriptive regulation.

Introduction

The roots of the Solvency II directive can be traced from the recommendations of the Sharma report back in 2002 and now we are in a shape where CEIOPS has published 80 consultation papers on the rationale and implementation aspects of the directive. The insurance industry since 2007 has doggedly pursued and is still pursuing its journey towards implementation of the Solvency II directive. Insurers are doing it with a single most belief that Solvency II will help in creating a level playing field for insurers across Europe which will also have significant positive benefits for all the stakeholders.

By far "Solvency II" has been the most discussed and debated topic in the insurance circle with more than 1.7 million results popping on a single search on the topic "Solvency 2" on Google. Most of the current discussions are around understanding, implementation, reporting and opposition of the Solvency II directive. This dissertation is towards answering mainly two questions as follows:

1. Is Solvency II going to be successful in improving the risk-management of insurers and providing adequate safeguards to ensure policyholder protection?

2. Even if it is successful in this regard, are resulting costs worth the benefits?

The dissertation begins with a brief explanation of the Solvency II directive, how it is different from the existing Solvency I directive, its components with discussion on the aims behind the Solvency II directive; it then moves on to explaining the possible broad advantages to stakeholders (mainly to the policy holders) due to arrival of Solvency II in section 2. In section 3 it goes on to making a case for the possible issues with the Solvency II directive in its current form with market research results done on those issues via prepared questionnaire. The issues identified are not the comprehensive but just are significantly important for the success of the Solvency II directive in its true spirit. In the penultimate section it outlines the possible implications of issues identified earlier on the insurance industry. Finally, in section 5 it concludes by making remarks on the marginal cost of the regulation outweighing the marginal benefit it is offering at least in the foreseeable future.

1. Solvency II

Solvency II is a fundamental review of the capital adequacy regime for European insurers and reinsurers, planned to take effect from January 2013. The current EU Solvency I regime has very simplistic formula-based capital requirements which are a function of reserves and sum at risk. These requirements give no credit to insurers for understanding and actively managing their risks, and do not achieve a good alignment of capital required against the underlying risks. There is also no requirement for a market consistent valuation of the liabilities, but rather liabilities are calculated with a prudential margin built into the key assumptions. The new regime is expected to apply to all insurance firms with gross premium income exceeding EUR5m or gross technical provisions in excess of EUR25m. [5]

Insurers are relentlessly pursuing their quest to comply with Solvency II regime since 2008-2009. Solvency II is seen by the insurance industry as a constructive step forward in insurance sector regulation that goes beyond the Solvency I approach of simply imposing rudimentary capital requirements towards enhancing policyholder protection through a more refined approach combining both quantitative and qualitative elements of supervision.

FSA (2008) describes aims of instilling Solvency II as follows:

- The main aim of Solvency II is not to increase overall capital levels, but rather to ensure a high standard of risk assessment and efficient capital allocation.
- It also aims to promote greater transparency to boost investor and consumer confidence, it fosters overall cost-effective, capital-effective product and service innovation and reduce reliance on capital requirements as an exclusive early warning equipment by complementing it with additional effective instruments such as governance and disclosure.
- Solvency II aims to achieve consistency across all member states by ensuring all member states follow the one directive and do not add any **gold plating*** provisions.

[5] Financial Services Authority, Insurance Risk Management: "The Path To Solvency II" ; September 2008

* Gold Plating: FSA back in 2004 introduced a twin peak calculation requirement which went beyond the paradigms of Solvency I. This additional requirement is sometimes known as gold plating.

2. Key Elements of the Solvency II regime

- Demonstrating Adequate Financial Resources (Pillar 1) applies to all firms and considers key quantitative requirements, including own funds, technical provisions and the Solvency II capital requirements: the Solvency Capital Requirement (SCR) and the Minimum Capital Requirement (MCR). [6]

- 'Systems of Governance (Pillar 2) and Reporting Requirements (Pillar 3) under Solvency II' applies to all firms, covering their risk management framework and functions, outsourcing, capital add-ons and supervisory reporting. [7]

- 'Use and Approval of Internal Models' addresses the standards and tests to be met by those firms which seek approval to calculate their regulatory capital by means of an internal model. [8]

The key elements of each of the three pillars are discussed below.

2.1. Pillar 1

Pillar 1 uses a market consistent balance sheet approach to valuing assets and liabilities with the capital requirements based on the underlying risks of the business.

2.1.1. Asset Valuation

Assets shall be valued at the amount for which they could be exchanged between knowledgeable willing parties in an arm's length transaction. [9]

2.1.2. Liability Valuation

Liabilities shall be valued at the amount for which they could be transferred, or settled, between knowledgeable willing parties in an arm's length transaction.

Technical provisions will be made up of the sum of a best estimate and a risk margin. Best estimate liabilities will be calculated using market consistent techniques. Where cash flows from insurance obligations can be replicated using market instruments for which a market value is directly observable, the market value of the liabilities shall be determined on the basis of the market value of those financial instruments; else best estimate liabilities will be determined using a mark-to-model approach.

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[6] Financial Services Authority, Insurance Risk Management: "The Path To Solvency II" ; September 2008

[7] Financial Services Authority, Insurance Risk Management: "The Path To Solvency II" ; September 2008

[8] Financial Services Authority, Insurance Risk Management: "The Path To Solvency II" ; September 2008

[9] Arm's Length Transaction: A transaction between two related or affiliated parties that is conducted as if they were unrelated, so that there is no question of a conflict of interest. Or sometimes, a transaction between two otherwise unrelated or affiliated parties.

The best estimate liability will include a valuation of policyholder contractual options and guarantees, including lapses and surrenders. This should be realistic and based on current and credible information. Allowance should be made for the impact that changes in future economic conditions might have on lapse and option take-up rates.

Risk margins will be calculated using a cost of capital approach based on the required capital for the risks and an assumed level of capital charge, where the capital required is the SCR.

2.1.3. Capital Requirements

Two required capital thresholds are defined under Pillar 1:

1. Solvency Capital Requirement ("SCR")

Calculated using either the relatively simple Standard Approach or using an internal Model. Supervisory action will be triggered if a company's resources fall below this level.

2. Minimum Capital Requirement ("MCR")

MCR is broadly calculated as a function of SCR. It is the level at which supervisors can invoke severe measures.

2.1.4. Eligible Capital or Own Funds

The total amount of eligible capital available to meet capital requirements is made up of basic and ancillary own funds, depending on the source of the capital (e.g. shareholder equity or debt) and whether it is subordinate to policyholder claims. The eligible capital is classified into different tiers to determine eligibility for meeting SCR and MCR.

2.2. Pillar 2

Pillar 2 defines the supervisory review process ("SRP") and the conditions governing business. Supervisors are required to review and evaluate the strategies, processes and reporting procedures, including:

- The system of governance in place;
- The qualitative elements under Pillar 1;
- Compliance with requirements for full and partial internal models; and
- The adequacy of methods used to identify emerging risks.

Based on its review of these elements, the supervisor may set a capital add-on in addition to the SCR if:

- The risk profile of the company deviates significantly from the assumptions underlying the SCR, either as calculated using the standard approach, or where certain risks are not adequately captured by an internal model; and

- There are perceived material failures in processes, systems, controls and strategies which cannot be corrected quickly.

- Capital add-ons will be reassessed at least on an annual basis and removed once deficiencies are remedied.

For use and approval of internal models individual firm has to comply with the individual regulatory authority guidelines in each member state E.g. The approval of internal model for a UK based firm can be obtained from FSA. Although firms are allowed to choose between standard formulae approach and internal models as per their convenience, in exceptional circumstances where the risk profile of the firm deviates significantly from the assumptions of the standard formula, the regulator may require the firm to pursue the internal model route under article 119 of the directive.

Under Pillar 2, companies need to have in place effective systems of governance, which provide for sound and prudent business management. This covers specific requirements relating to risk management, internal controls, the internal audit function, the actuarial function and control over outsourcing arrangements.

The risk management system must include strategies, processes and reporting procedures to monitor manage and report on all risk exposures of the company. It must also be integrated into the organisational structure and business processes of the company.

As part of the risk management system, all companies must regularly conduct an own risk and solvency assessment ("ORSA"). This must be an integral part of the business process, and be taken into consideration in strategic decision making, i.e. it must cover all business and strategic risks, as well as the risks covered by the Pillar 1 capital requirements.

The ORSA should include, as a minimum:

- The overall solvency needs of the company (having regard to specific risk profiling, company risk appetite and tolerance limits and company strategy) ;

- Compliance with requirements relating to technical provisions and Pillar 1 capital requirements on a continuous basis; and

- The extent of any deviations between the company's risk profile and the assumptions underlying the SCR.

2.3. Pillar 3

Pillar 3 defines the disclosure requirements, both for supervisory purposes and public disclosure. For supervisory purposes, the company will be required to provide sufficient

information for the supervisor to carry out its assessment under Pillar 2. This will include details of:

- The system of governance applied;
- The business of the company; the risks the company faces and the risk management system; the valuation principles applied; and
- The capital structure, needs and management.

Companies will be required to disclose publicly an annual report on their solvency and financial condition. This will include details of:

- The business and its performance;
- The system of governance; risk exposures, concentrations, mitigations and sensitivities; the valuation bases and methods applied for solvency purposes; and
- A description of capital management, covering the structure, amount and quality of own funds, the amounts of the MCR and SCR as well as details of any noncompliance.
- Separate disclosure of any capital add-on with its justification from the supervisor is also required. This may not be required for a transitional period of five years.

3. Key Advantages of Solvency II

The major improvements offered by Solvency II are as follows:

3.1. Market Consistent Valuation

The Solvency II directive mandates insurers to value their assets and liabilities using market consistent valuation. Particularly, Article 54 of the Solvency II directive suggests the calculation of technical provisions should be consistent with the valuation of assets and other liabilities, market consistent and in line with international developments in accounting and supervision.

The rationale behind market consistent valuation is an economically coherent framework for valuing contingent claims. It promotes better understanding of the risks that a company is exposed to which should encourage good risk management thinking. This in turn, and combined with appropriate alignment of management interests, should promote sound risk management action. Ultimately, stakeholders will judge the success of the market consistent framework by the outcomes of risk management actions taken by the organization.

3.2. Transparency

Insurers must have an adequate and transparent governance system with a clear allocation of responsibilities and effective reporting lines under the Solvency II regime. The regime identifies several 'functions', e.g. the risk management function and the actuarial function. Also, other requirements relate to internal control and internal audit namely design & implementation of audit tools, training & mentoring, reconfiguration & prioritization of auditable units; the need to carry out a self assessment of the company's risk and solvency position and insurers will need to continue to demonstrate that individuals in the key positions are adequately qualified and proper to do their jobs e.g. the board of an insurer has sufficient knowledge and expertise to exercise effective supervision over and offer a healthy challenge to senior management.

The increased transparency in the insurance business is aimed to ensure a uniform and enhanced level of policyholder protection across the EU, reducing the likelihood that policyholders lose out if insurers get into difficulties. A robust system will give policyholders greater confidence in the products of insurers and will keep the price of the insurance products competitive.

3.3. Risk Management Focus

Solvency II is a mission that aims at introducing and developing a risk oriented supervisory framework for insurers, in the sense that undertakings will have to hold capital on the basis of the risks they are facing and the way such risks are managed by the undertaking. In such a framework, the appropriate treatment of risks becomes a core issue for the soundness and effectiveness of the whole system.

The risk profile of a given undertaking should take into account both the internal and external risks that it faces, quantifiable and non quantifiable risks. In order to do so, there needs to be in place an appropriate interaction between the Pillar 1 (which would be dealing with quantifiable risks) and the Pillar 2, to incorporate those risks that, in principle, are deemed as non quantifiable (e.g. risks arising from strategic decisions or reputational risk). In addition, the interaction between the risks is more important as under stressed circumstance the interaction may come out totally different. Solvency II endeavors inculcate the enterprise wise risk management focus within the organization.

3.4. Early Warning Signals

Solvency II has introduced of two capital requirements namely SCR (Solvency Capital Requirement) and MCR (Minimum Capital Requirement). If an insurer's available resources fall below the SCR, then supervisors are required to take action with the aim of restoring the insurer's finances back into the level of the SCR as soon as possible. If, however, the financial situation of the insurer continues to deteriorate, then the level of supervisory intervention will be progressively intensified. The aim of this 'supervisory ladder' of intervention is to capture any ailing insurers before a serious threat to policyholders' interests.

If, despite supervisory intervention, the available resources of the insurer fall below the MCR, then 'ultimate supervisory action' will be triggered. In other words, the insurer's liabilities will be transferred to another insurer and the license of the insurer will be withdrawn or the insurer will be closed to new business and its in-force business will be liquidated.

The main rationale behind such layered approach is establishment of a better early warning mechanism and thus allows more time for supervisory intervention which helps not only in protecting the policy holders' interests but also reduces the systemic risk.

4. Complex issues with Solvency II

This section describes the issues evolved out of implementation of Solvency II. This paper is written when QIS 5 draft version is published only and some of the issues may be solved in the QIS 5 main version in future or changes in the directive may solve it.

I have conducted a Survey on the prepared questionnaire to arrive at the significance of the identified issues from qualified actuaries and risk management professionals who are involved currently in the Solvency II implementation project in various organizations in EU. The Survey results and discussions are individually publicized at the end of discussion on each of the issues.

4.1. Issues External to Solvency II Implementation

4.1.1. Occupational Pension Funds

According to CEA (2008) currently in EU countries both occupational pension funds and life insurers are pension providers. Occupational pension funds are not part of the Solvency II exercise but life insurers are compulsorily part of it. While individuals with pensions provided by life insurers will benefit from the high levels of protection to be delivered by Solvency II, those with pensions provided by occupational pension funds will not benefit from the same protections. Occupational pension funds and life insurers are in competition and pension funds in many countries are offering the same products as insurance companies but without the same capital backing. Exclusion of occupational pension funds would lead to inherent imbalance of capital requirements within the same market which will cause non level playing field, inconsistent supervision of pensions across the EU & lack of mobility of workers.

In the Survey I asked risk managers whether exclusion of occupational pension funds from Solvency II will create inconsistent capital requirements between insurers and whether the different capital requirement evolved out of this exclusion of occupational pension funds from Solvency II is desirable. The response was evenly matched between those who thought it will and those who were unsure about it, but the majority of respondents were of the opinion that it will not create inconsistent capital requirements. Surprisingly the response was even for respondents in favour or being unsure about the desirability of difference in the capital requirement between occupational pension funds and insurers with a minority believing it is not desirable to have different capital requirements. The main reason given was both having products with different risk profiles.

The risk profiles considered are different in the sense that most of the occupational pension funds are now defined contribution programs with lower risk to pension funds and in turn to companies while life insurers are selling annuity products for the remaining life of retirees which is considered more onerous.

4.1.2. Capital Savings

Capital savings are mainly to be found in life insurance whilst in the non-life insurance sector the capital requirement is going to increase significantly. The reasoning given is due to lower risks linked to life insurance and there is an opportunity for participation in the profit for the policyholders at least for with-profits or other savings contracts. In reality policyholders share losses as well is a debatable issue and hence, there is a question of unfair distribution of capital requirements between insurance firms. [10]

In the Survey I asked Solvency II experts if the capital savings (if any) are more likely to accrue to the life than to the non-life insurers and more than 57% of the respondents believe that Solvency II is impartial towards life and non life insurance sector, and nearly 43% of the respondents were unsure about it.

The main reasons cited for general insurers seeing increase in their capital requirement as compared to life insurers were due to the legacy of having capital not fully aligned to the risks of the general insurers and the nature of the uncertainties involved in general insurance business being more than in the life insurance sector.

4.1.3. Market Establish Controls

For the Solvency II regime to be effective in making overall good for the EU it needs to strike the correct balance between the costs and benefits of the Solvency II regime and a market-based system. From a purely economic standpoint, we need to address the question:

“Are marginal benefits of greater capital requirement greater than marginal social cost of insolvency weighted for the probability of the events that the additional capital requirements would have avoided?”

Such a balance is hard to measure and continuously monitored, as it needs to be based on a thorough understanding of the different risks that each company faces, combined with the capability of management to take sufficient mitigating action at the emergence of the first warning signals. CEA (2010) cite more recent advice from CEIOPS leading to “prudence on top of prudence”, which comes in the wake of 2008 crisis.

Even during the troubled times of 2008 -2009, the insurers within EU have not faced any serious challenges on their solvency and business overall as compared to banks that were already under Basel II norms. Under QIS 5 norms the SCR standard formula excessively overestimates the requirement for long-term risks. The effect is further compounded by the fact that Solvency II aims to take account of all balance-sheet risks – thus those insurance companies that seek to take the prudent approach of matching

[10] Helman le Pas de Sécheval, 2009. Keynote Speech: Solvency II: the reason why this project must be reviewed [Online], Available at:”:

http://www.sme-union.eu/viewdoc.php?LAN=en&FILE=doctext&ID=868

long-term liabilities with long-term assets, find themselves severely penalized – as they are long-term insurance branches.

The overall effect of similar overly prudent measures have the clear potential to undermine the good functioning of the market i.e. will undermine the market established controls by itself, leading to a wave of consolidation and reduced competition. The highly conservative capital requirements envisaged by CEIOPS have a potential of imposing an additional level of capital cost. This extra cost would in turn be transferred to stakeholders in the form of higher prices, lower returns for investors, lower supply and the reduced competitiveness of the EU insurance market, as insurers would need to the behaviour to the new environment.

In the Survey nearly 86% of the respondents believe that CEIOPS guidelines were prohibitively prudent and would likely undermine the market established controls and almost all of them were of the opinion that insurance sector was going to see a significant consolidation post Solvency II.

In the Survey more than 71% of the respondents expect mutual businesses being almost extinct in the coming future. The main reason cited was changing nature of business and mainly decline in the number of with-profits policyholders who are the owners and capital providers and increasingly stringent capital requirements for insurance business under Solvency II.

4.2. Issues Internal to Solvency II Implementation

4.2.1. Theoretical Challenges

4.2.1.1. Over – Reliance on Value at Risk (VaR)

The Solvency II directive under article 101(3) outlines SCR calibration requirement as follows: "SCR shall correspond to the Value-at-Risk of the basic own funds of an insurance or reinsurance undertaking subject to a confidence level of 99.5 % over a one-year period."

The requirement for using a different risk measure to evaluate the SCR is also outlined under CP 56 and subsequent papers. Other risk measures like Tail Value at Risk (TVaR) are also outlined by CEIOPS but the baseline risk measure for the purpose of regulatory approval is predominantly going to be the 1 year 99.5% VaR of the Basic Own Funds. This norm comes from BASEL II norms for banking industry.

The banking risk profile is not similar to insurance companies is an established fact. Most bank liabilities are very short term in nature whereas insurance liabilities can be very long term in nature. Also insurance products are more vulnerable to economic condition such as inflation, interest rate movement and other external environment factors due to inherent guarantees and options built into the products. Apart from that Value at Risk has many theoretical limitations as follows:

1. VaR has serious theoretical limitations at least in the tails of the distributions

a. VaR provides no information on the magnitude of the loss post loss event

b. VaR is not sub additive and hence there exist situations where it behaves poorly under aggregation (Artzner et al. 1999)

c. Since VaR is not convex, optimization problems with VaR constraints can be difficult to solve numerically (Winker and Maringer 2007)

2. VaR when calculated using Monte Carlo methods involving numerical integration and tail optimization methods becomes too complex to be understood by the top management with whom the specialist skills might not be available

3. VaR is more appropriate for short term liabilities and not for long term liabilities[11]

In the Survey more than 86% of the respondents believe that there exists danger of over-reliance on VaR under Solvency II because of the above mentioned issues. The remaining respondents are of the opinion that any risk measure will have some limitation and as a pragmatic approach to measurement we should adopt more than one risk measure to understand the overall picture rather than overly relying on VaR as the risk measure.

4.2.1.2 Stability Issues with SCR Aggregation formula

Under QIS 5 norms standard formulae for calculation of SCR is given as follows:

$SCR = BSCR - Adj + SCR_{Op}$

$$BSCR = \sqrt{\sum_{ij} corr_{ij} * SCR_i * SCR_j} + SCR_{intangibles}$$

BSCR = Basic Solvency Capital Requirement

$Corr_{ij}$ = the cells of the correlation matrix CorrSCR

SCR_i, SCR_j = Capital charges for the individual SCR risks according to the rows and columns of the correlation matrix CorrSCR.

$SCR_{intangible}$, SCR_{Op} = the capital requirement for intangible asset risk calculated in accordance with SCR, the capital requirement for operational risk respectively

Adj = Adjustment for the risk absorbing effect of technical provisions and deferred taxes

[11] Nassim N Taleb's video interview at VaR congress available at: http://www.youtube.com/watch?v=ujTANpSXIvY and Nassim N. Taleb. The Black Swan: The Impact of the Highly Improbable

Pfeifer,D. and Strassburger,D. (2007) have demonstrated using beta distribution that even if the individual SCRs (based on VaR as the underlying risk measure) are exactly known, and the resulting aggregate risk distribution is symmetric (and hence no calibrations are necessary), the square root formula can severely underestimate the true SCR.

The following stability issues with SCR aggregation formula. The issue is prevalent when the risks of individual lines of businesses are not normally distributed.

4.2.1.2.1 Misspecification of SCR, risks being independent

The square root formula in most cases significantly underestimates the true SCR, particularly in cases where the distribution of the aggregate risk is skewed to the left; and overestimates the true SCR in cases where the distributions of the aggregate risk are skewed to the right, which indicates the square root formula produces deviations in both directions.

4.2.1.2.2 Misspecification of SCR risks being uncorrelated but dependent

It is the generic limitation of the square root formula that it does not allow the explicit sums of dependent but uncorrelated random variables.

Hence, for the general purposes necessary calibrations of the standard SCR aggregation formula based on skewness and/or correlation alone is sufficient. The paper also suggests that if the general implementation approach of calibrating standard formula based on correlation or skewness is used then it will put companies using sophisticated internal models at a disadvantage in comparison with those companies that only use a standard approach.

In the Survey I asked Solvency II experts whether this misspecification issue was significantly affecting or will affect those companies using internal models (e.g. grid copula based approaches). As an internal model approach if applied properly will certainly give rise to significantly higher capital requirement than derived using standard formulae approach. More than 60% of the respondents did not give any comment on this issue and remaining 20% were of the opinion that it is not affecting big companies as standard formula approach is mostly going to be used by smaller firms mainly and secondly the parameterization under standard formulae approach is stringent enough to take care of it. The remaining 20% were of the opinion that a full multivariate approach is better suited than the square root formulae approach used by CEIOPS for standard formulae approach where the underlying risks can be modeled properly, also by combining univariate risks using a correlation matrix or copula both could be technically incorrect.

As part of the Survey I asked the question "Do you consider use of standard formulae should be allowed for certain non complex and short duration insurance contracts only?" Most of the respondents said it would be difficult to classify the businesses into complex vs. non complex and objectivity of the regulation can be lost as almost any product features from providers need not have the absolutely identical risk profiles.

4.2.2. Practical Challenges:

4.2.2.1. Use of Solvency II framework as part of decision making Process & Model coverage:

According to the IAIS [12] guidance (& CP 56) the internal model for Solvency II is not just a quantitative tool that is used for assigning capital purely to meet regulatory requirements. But it should also serve as comprehensive risk and capital management tool, relevant for the needs of the insurer based upon its individual risk profile.

The Solvency II Directive acknowledges this wider application in Article 118, which requires firms to demonstrate that the internal model is 'widely used' in their economic capital assessment. This wider scope of work and expectations from internal models is considered as "Extreme Engineering". By Extreme Engineering I mean where we are aiming to achieve too many futuristic objectives with such a single enterprise wide initiative and chances of it failing as a tool of overall risk management are very high.

There are very high chances that companies may not use such extreme engineered models in their day to day decision making processes. The two main reasons could be limitations on inclusion of all the relevant assumptions in a coherent manner and inability to include all the risks facing different products. The secondary reason being maintenance costs of such model(s) is far outweighing the benefits produced as companies may find individual small models easier to handle and effective at least for the short term goals.

In the Survey I asked Solvency II experts whether they believe that firms will be able to use the Solvency II framework or internal models in their day to day decision making process and whether it is practical to achieve success in building, maintaining and using such wide scoped (internal) models. For both of the questions I have got an overwhelmingly positive response and they believe that the Solvency II directive is being more of discipline into the decision making process rather than number crunching and reporting requirement.

[12] International Association of Insurance Supervisors

4.2.2.2. Reliance on Expert Judgments

Expert judgment as described under QIS 5 may be necessary for

- Calculation of the best estimate;
- Data selection, correction of data errors and decisions about treatment of outliers or extreme events;
- Data adjustments to reflect current or future conditions, and adjusting external data to reflect the undertaking's features or the characteristics of the relevant portfolio;
- Selection of time period of the data;
- Selection of realistic assumptions (particularly under ESG implementations);
- Selection of the valuation technique or choice of the most appropriate alternatives existing in each methodology;
- Selection of the environment under which the undertakings have to run its business.

In CP 56 under "Data and Expert Judgment" (5.184) CEIOPS mandates expert judgment have known or potential error rate, and standards concerning the operation of its methodology must exist and be maintained.

According to a Survey conducted by Roger et al. (2009) the companies intending to develop internal models expect to continue to place a great deal of reliance on expert judgment. In areas such as arriving at probability distribution forecasts (PDF) or correlation factors (at least when the data is unreliable & incomplete), expert judgment will continue to play a central role for many years to come. It is therefore all the more important that the rules around the extent to which judgment has to be arrived at or validated are realistic in practice. Currently, CEIOPS advice suggests expert judgment is only admissible if derived using a scientific method should have a known potential error rate and validated which seems to be significantly onerous requirement.

The responses from the Survey are fairly definitive in their conclusion with 86% of the respondents believed that CEIOPS requirements are practically non workable and 57% of the respondents believed that guideline of scientific method fully backing the expert judgment is also not practically workable.

4.2.2.3. Probability Distribution Forecast & Spurious Accuracy:

Statistical quality standards 5.39 of CP 56 quotes as follows:

"CEIOPS regards a probability distribution forecast with more data points as a stronger basis for the undertaking's risk management and as providing better support for its decision-making processes. Therefore, a methodology providing a richer distribution forecast is generally to be preferred to others."

Although CEIOPS has made it clear that full PDF may not be possible or feasible at all times, the approval of such scant PDFs there are certain criteria to be fulfilled by the firm. E.g. the undertaking has to demonstrate that the methodology chosen takes into account current knowledge and developments in internal modelling or justify its choice of not taking into account some of them, in particular in light of the proportionality principle and its risk profile.

It all seems to have been suggesting the relevance of the use of Economic Scenario Generator (ESG) in developing the Probability Distribution Forecasts due to their ability to generate many more paths especially when the data points are limited and reliance on such data is questionable. ESG seems to provide a solution immediately to the lack of data points. The issue is actually not solved as companies will have to use market consistent ESG models. The market consistent ESG model introduces issue of spurious accuracy of models as it implicitly ignores micro-market features such as shallow markets, illiquid markets and bid-offer spread. Each of these factors can be considered to contribute in some measure to a liquidity premium. Also, using real world ESGs would be another approach that firms can use but it would be hard to justify the scenarios which may not have been prevalent or directly visible to various stake holders at the same time.

In the Survey, I asked Solvency II experts question whether use of market consistent or real world scenario based ESG models may introduce some level of spurious accuracy into modeling. More than 64% of the experts believe that use of real world scenario based ESGs pose significantly the risk of spurious accuracy whereas only less than 15% of the respondents believe that market consistent ESGs pose significant risk of spurious accuracy.

On the issue of use of real world scenarios not being straightforward to justify to the all the stakeholders as they may have different objectives. The responses were evenly distributed between "Yes" and "No".

5. Possible implications

5.1. Profitability Optimization

CEA (2010) suggests that insurers initially would try to minimize the reduction in profitability by either reducing the cost of the capital buffer required (e.g. applying precise internal models or reducing the cost of funding) or improving profitability in other ways (e.g., by reducing costs). Arguably, if such actions were feasible, each insurer would embark on them anyway, independent of the Solvency II Pillar 1 calibration, to improve the surplus to the benefit of either its policyholders (e.g., reduced prices) or its shareholders (e.g., higher dividends). However, there exists no evidence that the more inflated capital requirements, the more optimization efforts driven to the extremes of a sound and proper use of capital models.

5.2. Transfer of Extra Capital

Insurers would seek to transfer the higher capital requirements to new "risk owners" by exploiting any market-based solution or even regulatory arbitrage. This can be achieved, for example, through reinsurance, financial hedging, issuance of insurance-linked securities (which are currently out of Solvency II directive) or a carve-out of run-off books of business. Multinational players may also use captive reinsurance to transfer risk into more favourable solvency jurisdictions. In spite of being economically viable, such activities would have the inevitable effect of reducing the absolute level of industry profitability and, therefore, reducing the attractiveness of the industry to new investors.

5.3. Conservative Policy Design

Stricter norms on capital requirements will force insurers to reduce product benefits and features. Coverage might be reduced to carve out capital-intensive elements. Guarantees could be reduced to minimize mismatch risks or hedging costs. Deductibles could be increased, co-payments increased or policy limits reduced to make policyholders retain more risk themselves.

Alternatively, the increased cost of insurance directly or indirectly means the neediest people will not be able to afford it and will have damaging effects on to the society as compelling policyholders to retain more of the capital-intense risks that used to be covered earlier.

5.4. Extra Cautious Asset Allocation & Market Exit

Under the Solvency II standard formula approach we can see that to reduce the capital allocated to market risks, insurers might be encouraged to overweight lower-yield fixed-income assets in their investment portfolios, affecting the expected investment returns earned on behalf of policyholders. Overly conservative investment strategies, in reaction to overly prudent capital requirements, might erode the wealth-building potential of long-term savings and pension products. For example, a potential reduction in expected yield of 1–2% a year may trim the accumulated pension savings of a retiree by up to 30–50% after 20–25 years. (CEA, 2009)

If the insurers fail to meet target profit levels, they would have no other option but to reduce underwriting capacity in the lines of business that remain unprofitable or even exit certain product lines and markets. Furthermore, an imposed reduction of underwriting capacity would negatively affect the competitiveness and future development of the whole sector.

6. Conclusion

As mentioned earlier the complex issues discussed in the dissertation are not comprehensive but like tips of an iceberg! To be successful as a regulation in true fortitude the Solvency II or for that matter any regulation needs to have marginal benefit outweighing its marginal costs of it. The Solvency II directive is the first constructive step towards coherent risk management framework but it is not a panacea in its current form. The market wide initiatives like Solvency II will always remain open for improvements but they are needed for effective functioning of insurance business. From the research done above it is evident that there are very high chances that Solvency II will make industry more capital intensive and cost of insurance will increase at least in the near future and by simply increasing the capital requirements we are trying to treat a different disease than what we are suffering from one.

I would like to make certain humble recommendations for the successful accomplishment and functioning of the Solvency II directive to its stakeholders:

- The directive should be applicable to all the firms simultaneously with similar risk profiles such that a level playing environment is being created
- Avoid giving life companies an artificial advantage over non-life companies. The capital charges must not disproportionately castigate high intensity, low frequency insurance sectors and/or insurers holding long-term assets to cover long-term liabilities as a far-sighted strategy
- Reliance on Value at Risk can be reduced by embracing large number of risk measures and regulators should not be judging the firms with single number but a comprehensive review should be carried out before arriving at a decision
- The standard formulae approach should be based on multivariate risk factors approach instead of a simplistic correlation based approach for aggregation of risks
- The solvency II directive guidelines needs to be less dogmatic as it is a principal based regulation and not prescriptive one. E.g. Removing known error rate requirement for expert judgment will make it less prescriptive and practically workable
- Where possible we can reduce the possibility of building “Prudence on top of the prudence” which will not only help us in making insurance business more profitable and less succumbed to systemic risk but also help us in making insurance products available to the neediest people in the society.

I. Appendix A – Prepared Questionnaire

I.1. External Issues

I.1.1. Exclusion of Occupational Pension Funds:

According to CEA (2008) Currently in EU countries both occupational pension funds and life insurers are pension providers. Occupational pension funds are not part of Solvency II exercise but life insurers are compulsorily part of it. While individuals with pensions provided by life insurers will benefit from the high levels of protection to be delivered by Solvency II, those with pensions provided by occupational pension funds will not benefit from the same protections. Occupational pension funds and life insurers are in competition and pension funds in many countries are offering the same products as insurance companies but without the same capital backing. By not applying Solvency II on to pension funds would lead to inherent imbalance of capital requirements within the same market which will cause non level playing field, inconsistent supervision of pensions across the EU & lack of mobility of workers.

I. Do you agree that the exclusion of pension funds from Solvency II will create inconsistent capital requirements between insurers and pension funds? (Yes / No)

II. If yes, do you believe it is desirable that pension funds and insurers have different capital requirements? (Yes / No)

III. Any further comments on the issue? (May be based on any published study or paper you suggest I should read on the issue)

I.1.2. Capital Savings:

Capital savings are mainly to be found in the life insurance whilst in the non-life insurance sector the capital requirement is going to increase significantly. The reasoning given is due to lower risks linked to life insurance and there is an opportunity for participation in the profit for the policyholders at least for with-profits or other savings contracts. But in reality do policyholders share losses as well is a debatable issue and hence, there is a question of unfair distribution of capital requirements between insurance firms.

I. Do you agree that the capital savings (if any) are more likely to accrue to the life than the non-life industry under Solvency II? (Yes / No)

II. Any Comments on the issue? (May be based on any published study or paper you suggest I should read on the issue)

I.1.3. Market Establish Controls:

Even during the troubled times of 2008 -2009, the insurers within EU have not faced any serious challenges on their solvency and business overall as compared to banks that were already under Basel II norms. Under QIS 5 norms the SCR standard formula excessively overestimates the requirement for long-term risks. The effect is further compounded by the fact that Solvency II aims to take account of all balance-sheet risks – thus those insurance companies that seek to take the prudent approach of matching long-term liabilities with long-term assets, find themselves severely penalized – as they are long-term insurance branches. The overall effect of similar overly prudent measures will have the clear potential to undermine the good functioning of the market i.e. will undermine the market established controls by itself, leading to a wave of consolidation and reduced competition.

I. Do you agree that CEIOPS guidelines are prohibitively prudent and are likely to undermine the market established controls in general? (Yes / No)

II. Do you see any possible wave of consolidation within the insurance sector? (Yes / No)

III. Do you see mutual insurers becoming extinct? (Yes / No)

IV. Any Comments on the issue? (May be based on any published study or paper you suggest I should read on the issue)

I.2. Internal Issues

I.2.1. Theoretical Challenges:

I.2.1.1. Over – Reliance on Value at Risk (VaR):

In CP 56, CEIOPS discuss the requirements for using a different risk measure to evaluate the SCR. The baseline risk erasure is the 1 year 99.5% VaR of the Basic Own Funds. This norm comes from BASEL II norms for banking industry. The banking risk profile is not similar to insurance companies in many aspects predominantly bank liabilities are very short term in nature whereas insurance liabilities can be very long term in nature also inclusion of guarantees and options into the products make them more vulnerable to economic condition such as inflation, interest rate movement and other external environment factors. Apart from it Value at Risk has many theoretical limitations as follows:

I. VaR has serious theoretical limitations at least in the tails of the distributions

   a. VaR provides no information on the magnitude of the loss post loss event

   b. VaR is not sub additive and hence there exist situations where it behaves poorly under aggregation (Artzner et al. 1999)

c. Since VaR is not convex, optimization problems with VaR constraints can be difficult to solve numerically (Winker and Maringer 2007)

II. VaR is too complex to be understood by the top management with whom the specialist skills might not be available

III. VaR is more appropriate for short term liabilities and not for long term liabilities

a. Do you agree there is a danger of over-reliance on VaR under Solvency II because of the above issues? (Yes / No)

b. Any Comments on the issue? (May be based on any published study or paper you suggest I should read on the issue)

1.2.1.2. Stability Issues with SCR Aggregation formula:

Dietmar Pfeifer and Doreen Strassburger (2007) have shown the two of the following stability issues with SCR aggregation formula. The issue is prevalent when the risks of individual lines of businesses are not normally distributed.

1. Misspecification of the overall SCR even if the risks are independent: The square root formula in most cases significantly underestimates the true SCR, particularly in cases where the distribution of the aggregate risk is skewed to the left; and overestimates the true SCR in cases where the distributions of the aggregate risk are skewed to the right, which indicates the square root formula produces deviations in both directions.

2. Misspecification of the overall SCR if the risks are uncorrelated but dependent: It is the generic limitation of the square root formula that it does not allow the explicit sums of dependent but uncorrelated random variables.

I. Do you consider the misspecification issue is significant enough such that companies using internal models (e.g. grid copula based approaches) will be at a disadvantage in terms of capital requirements from the firms using standard formulae approach? (Yes / No)

II. Do you consider use of standard formulae should be allowed for certain non complex and short duration insurance contracts only? (Yes/ No)

III. Any Comments on the issue? (May be based on any published study or paper you suggest I should read on the issue)

I.2.2. Practical Challenges

I.2.2.1. Use of Solvency II framework as part of decision making Process & Model coverage:

According to IAIS guidance (& CP 56) the internal model for Solvency II is not just a tool which is used for assigning capital purely to meet regulatory requirements and defines it instead as a wider risk and capital management tool, relevant for the needs of the insurer based upon its individual risk profile. The Solvency II Directive acknowledges this wider application in Article 118, which requires firms to demonstrate that the internal model is 'widely used' in their economic capital assessment. This wider scope of work and expectations from internal models is considered as "Extreme Engineering". By Extreme Engineering I mean where we are trying to achieve too many objectives with such a single enterprise wide initiative and chances of it failing as a tool of overall risk management are very high.

I. Do you consider companies will be able to use Internal Models in the day to day decision making process realistically? (Yes / No)

II. Do you see success of such wide scoped internal model in handling the overall risk of the insurer is practically achievable? (Yes / No)

III. Any further comments on the issue? (May be based on any published study or paper you suggest I should read on the issue)

I.2.2.2. Reliance on Expert Judgments:

According a Survey conducted by Roger et.al (2009) showed that the companies intending to develop internal models expect to continue to place a great deal of reliance on expert judgment. In areas such as arriving at probability distribution forecasts (PDF) or correlation factors (at least when the data is unreliable & incomplete), expert judgment will continue to play a central role for many years to come. It is therefore all the more important that the rules around the extent to which judgment has to be arrived at or validated are realistic in practice. Currently, CEIOPS advice suggests expert judgment is only admissible if derived using scientific method, should have known potential error rate and validated.

I. Do you agree with CEIOPS advice on having a known error rate in the expert judgment is practically workable? (Yes/ No)

II. Do you agree with CEIOPS advice on having a scientific method fully backing the expert judgment is practically workable especially when data set is limited or nonexistent? (Yes / No)

III. Any further comments on the issue? (May be based on any published study or paper you suggest I should read on the issue)

1.2.2.3 Probability Distribution Forecast & Spurious Accuracy:

Statistical quality standards of CP 56 seems to have been suggesting the relevance of the use of ESGs in developing the Probability Distribution Forecasts due to their ability to generate many more paths especially when the data points are limited and reliance on such data is questionable. ESG seems to provide a solution immediately to the lack of data points. The issue is actually not solved as companies will have to use market consistent ESG models. The market consistent ESG model introduces issue of spurious accuracy of models as it implicitly ignores micro-market features such as shallow markets, illiquid markets and bid-offer spread. Each of these factors can be considered to contribute in some measure to a liquidity premium. Also, using real world ESGs would be another approach that firms can use but it would be hard to justify the scenarios which may not have been prevalent or directly visible to various stake holders at the same time.

I. Do you agree with use of market consistent ESGs introduce spurious accuracy into modeling? (Yes / No)

II. Do you agree with the use of real world scenario based ESGs may introduce spurious accuracy into modeling as they are as good as the assumptions about the probable scenarios? (Yes / No)

III. Do you agree with the issue of real world scenarios may not be easy to justify to the regulators and shareholders at the same time as they may have different objectives? (Yes / No)

IV. Any further comments on the issue? (May be based on any published study or paper you suggest I should read on the issue)

II. Appendix B – Respondent name list on the project questionnaire

I sent the prepared questionnaire attached here as "Appendix A – Prepared Questionnaire" to 180 Solvency II experts mainly qualified actuaries and risk managers working in the area of Solvency II. I have received 20 responses in total. The Survey may not be statistically significant but the experts who have responded to the questionnaire are well established actuaries or risk managers. [13]

NOTE: The Survey responses represent the views of the respondents personally and do not make any statement about the views of the organizations they work for currently or previously.

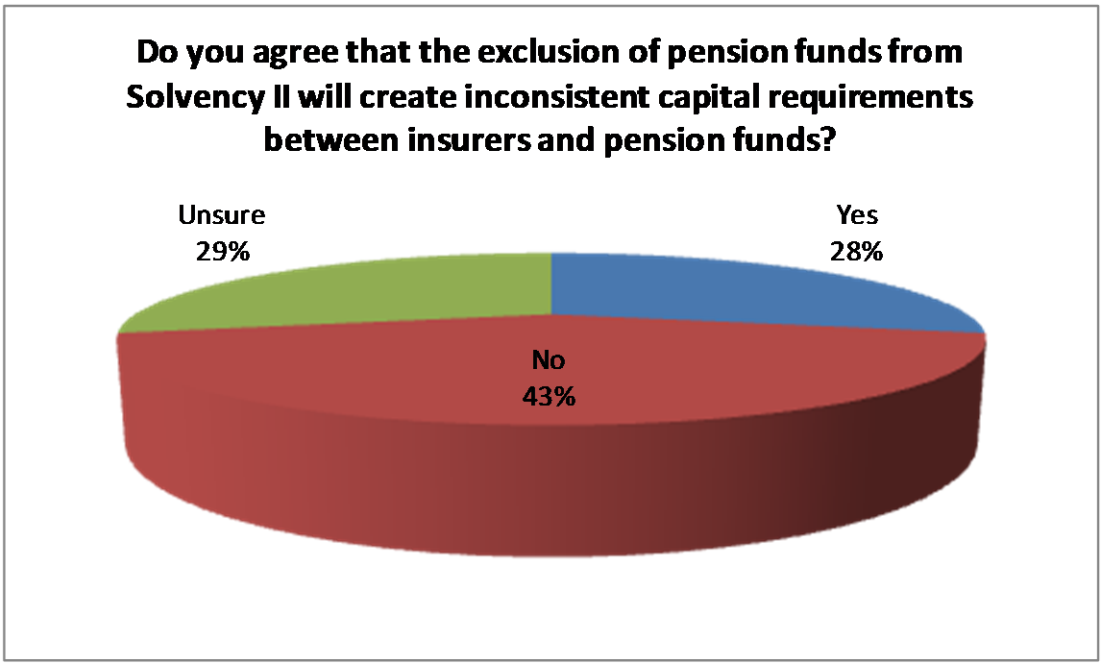
Following is the list of respondents on the Survey who have not put any restriction on declaring their identity/name.

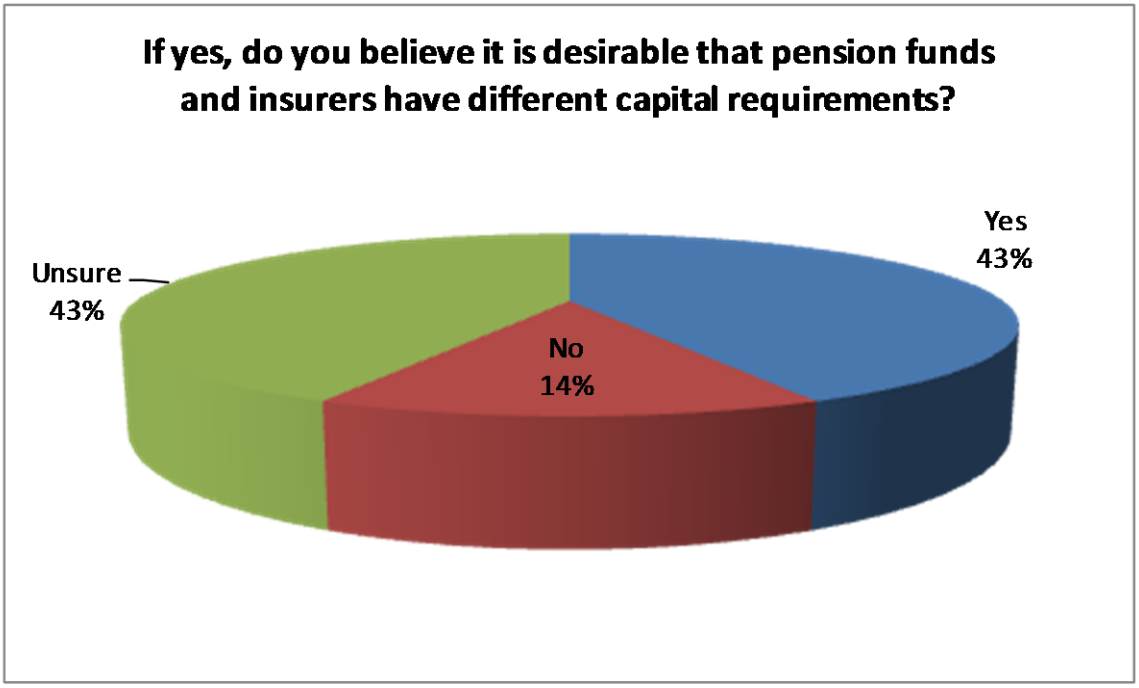
No.	Respondent Name
1.	Mr. Andrew Slater
2.	Mr. Bergman Bernhard
3.	Mr. Elliot M. Varnell
4.	Mr. Fabrice Brossart
5.	Mr. Waleed Sarwar
6.	Mr. Bruce Porteous
7.	Mr. Christophe Harrigan
8.	Mr. Jan Piekoszewski
9.	Ms. Kathryn Morgan
10.	Mr. Neeraj Kumar
11.	Mr. Alex Hindson

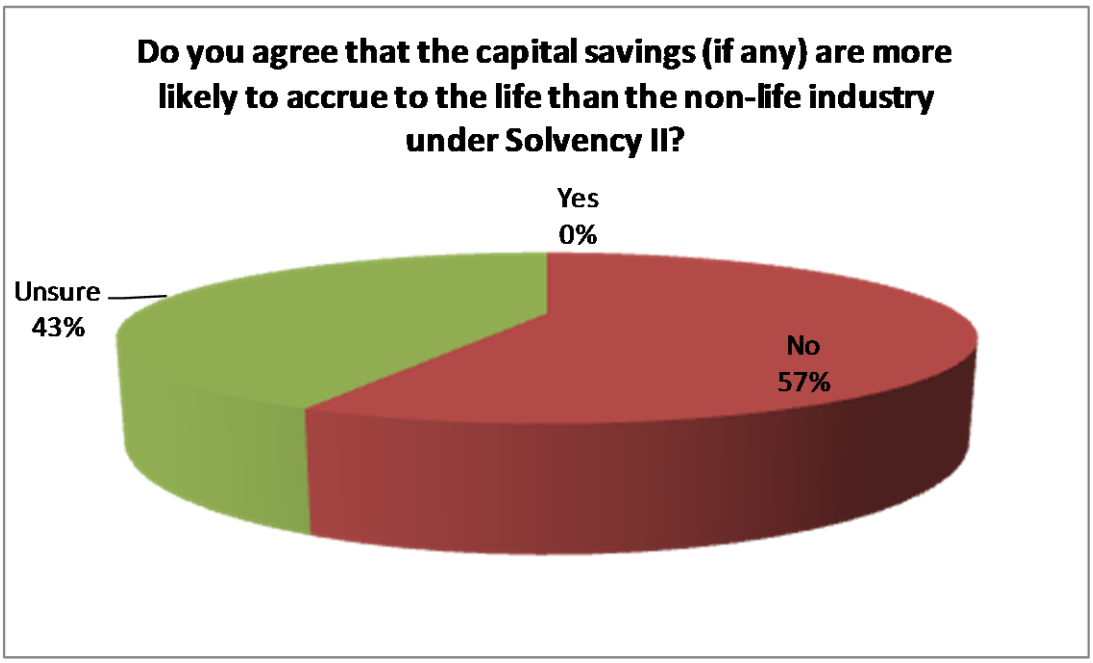
[13] Note: The details of individual questionnaire responses will be made available upon request for the names given in the list. There are 4 respondents who wished not to publish their names in the list and their responses will not be made available upon request.

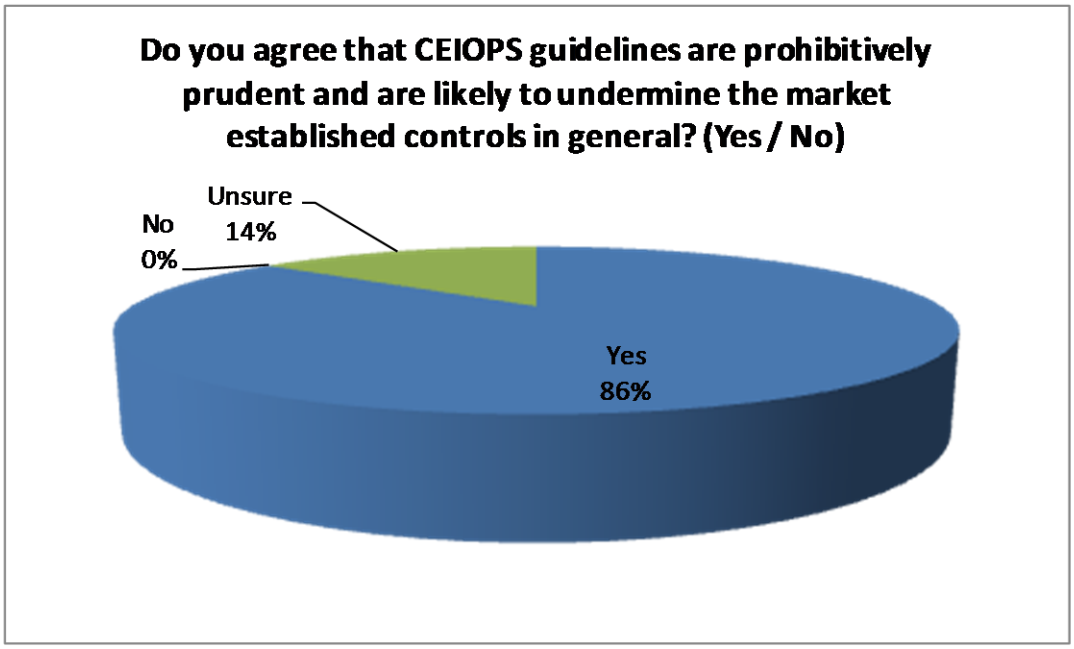
12.	Mr. Robert Chanon
13.	Mr. Aziz Boghani
14.	Mr. Adam Seager
15.	Mr. Dhirendrakumar Sakaria
16.	Mr. Anshuman C. Choudhari
17.	
18.	
19.	
20.	

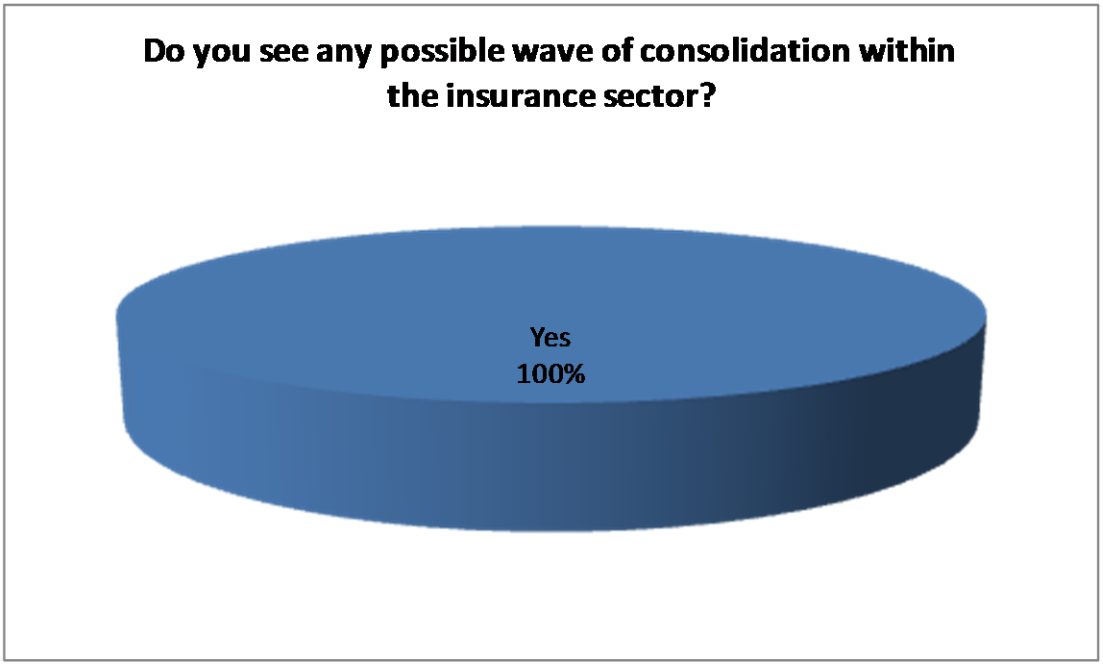
III. Appendix C – Aggregate Responses

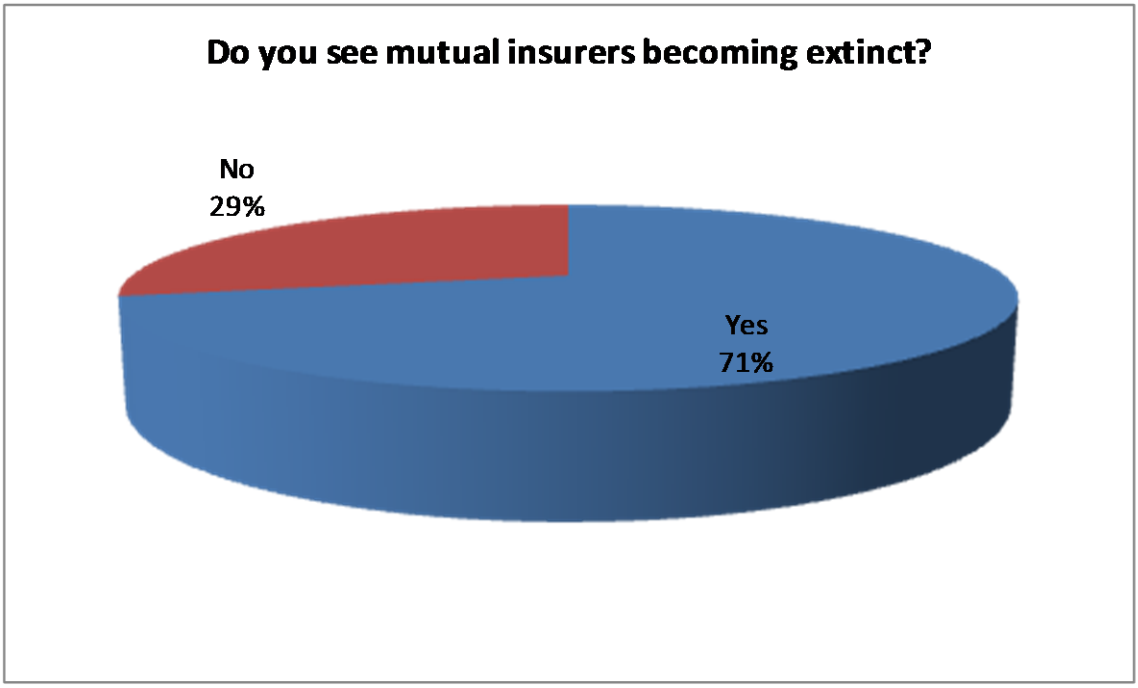


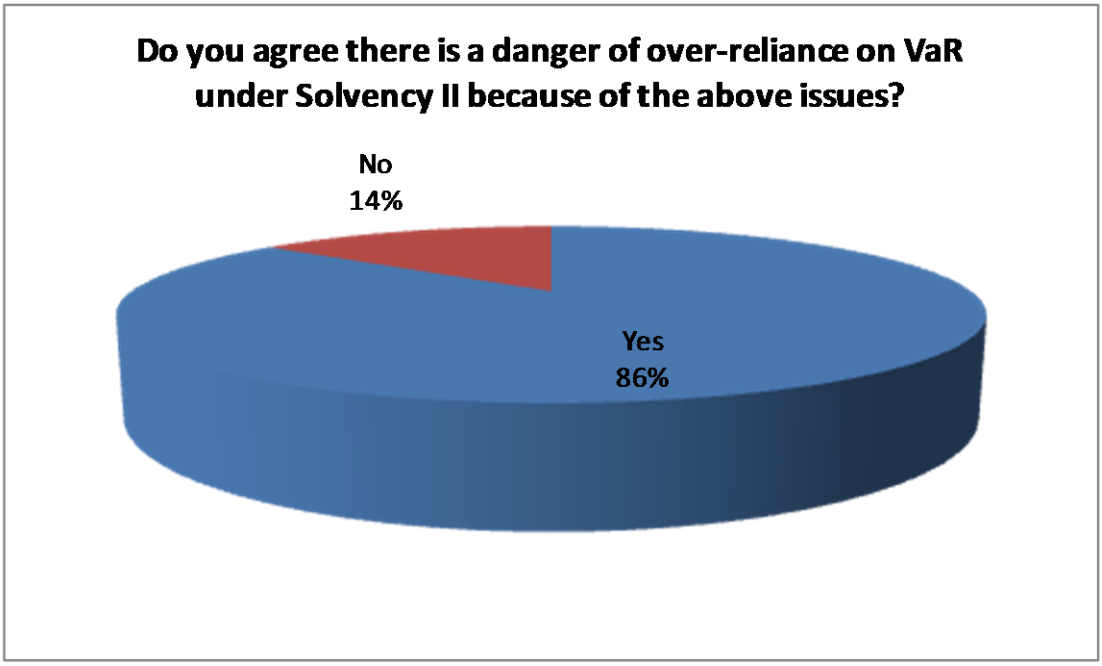


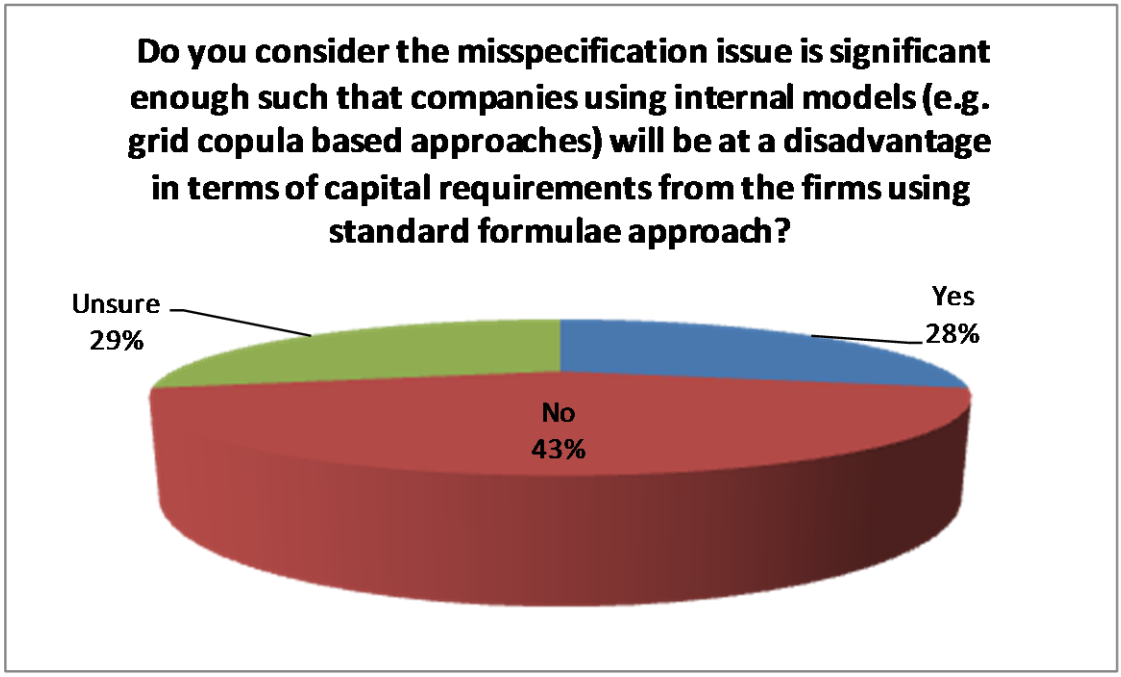

Do you agree that the capital savings (if any) are more likely to accrue to the life than the non-life industry under Solvency II?
Yes
0%
Unsure
43%
No
57%

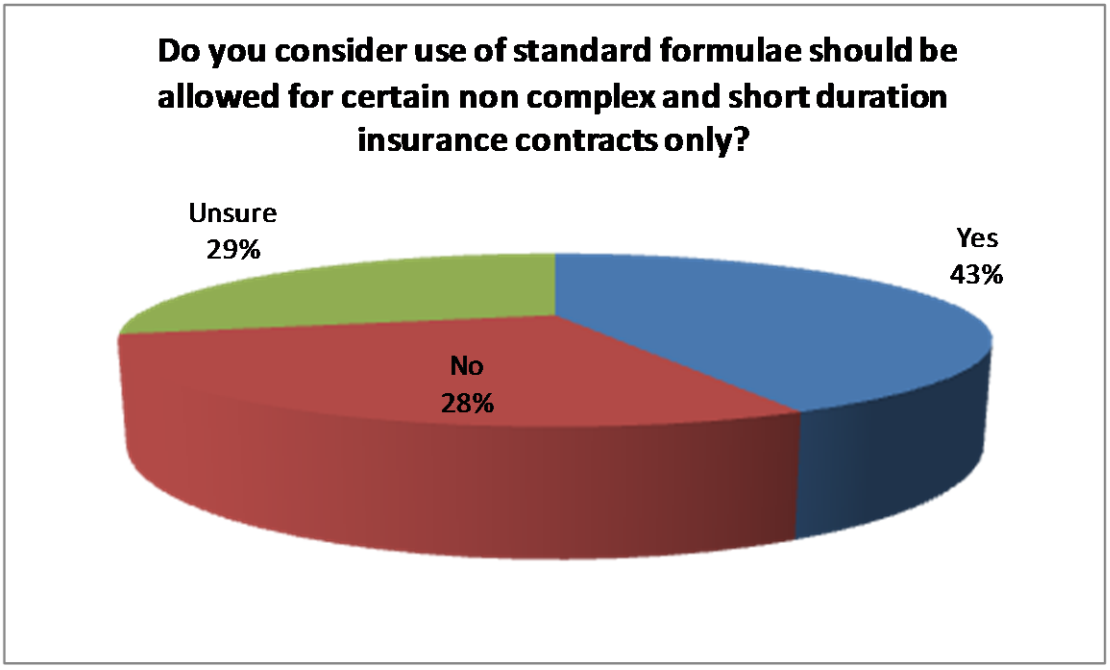

Do you agree that CEIOPS guidelines are prohibitively prudent and are likely to undermine the market established controls in general? (Yes / No)
Unsure
14%
No
0%
Yes
86%

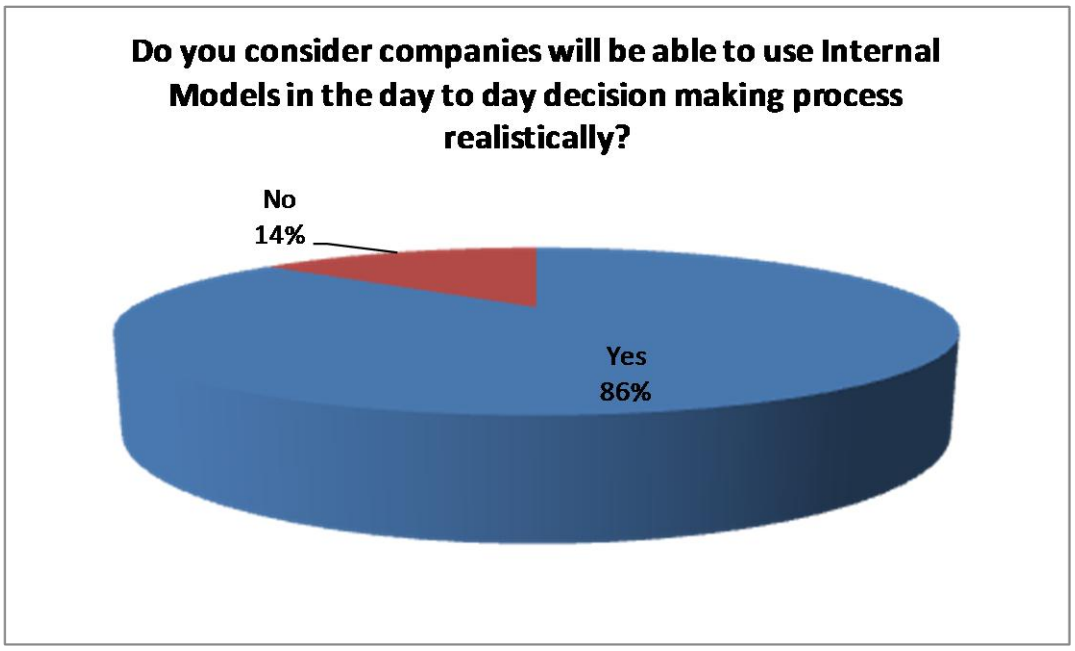

Do you see any possible wave of consolidation within the insurance sector?
Yes
100%

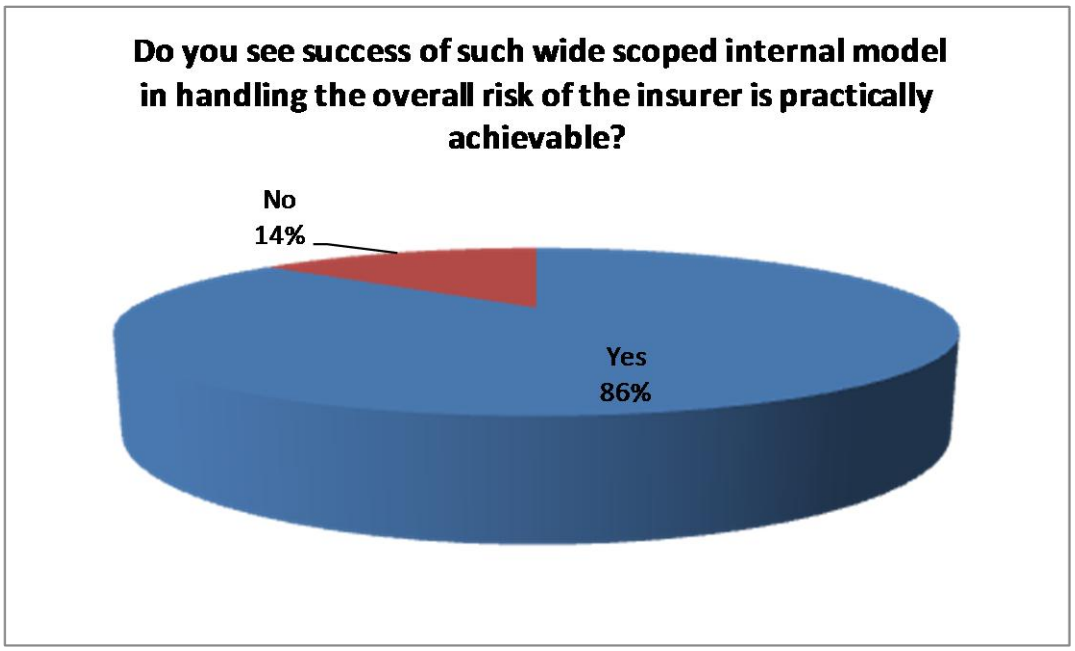

Do you see mutual insurers becoming extinct?
No
29%
Yes
71%

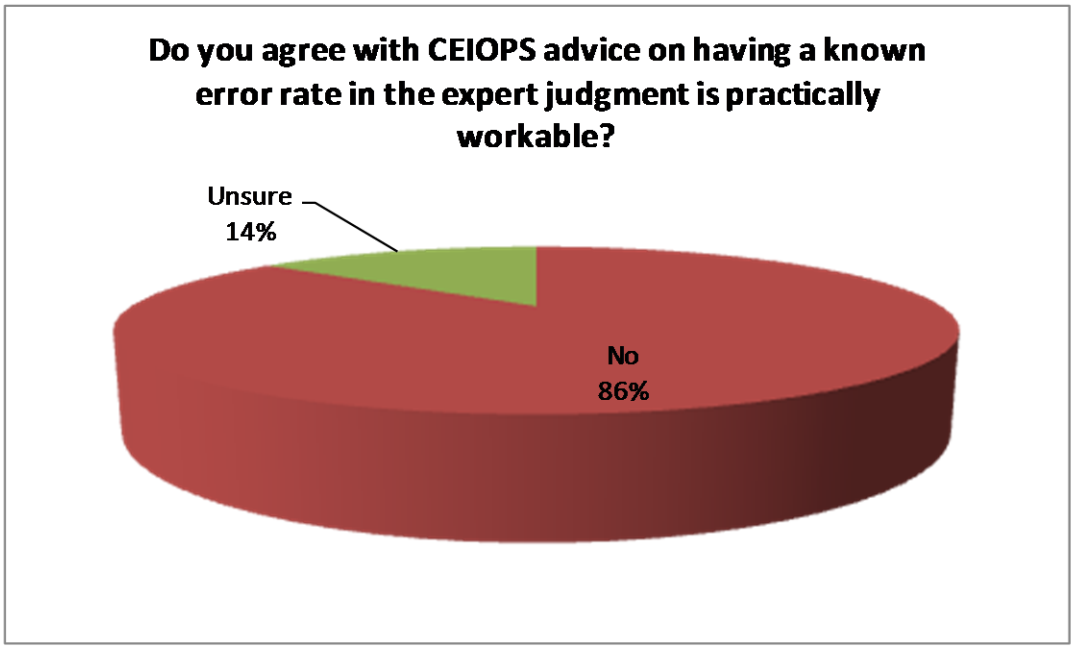

Do you agree there is a danger of over-reliance on VaR under Solvency II because of the above issues?
No
14%
Yes
86%

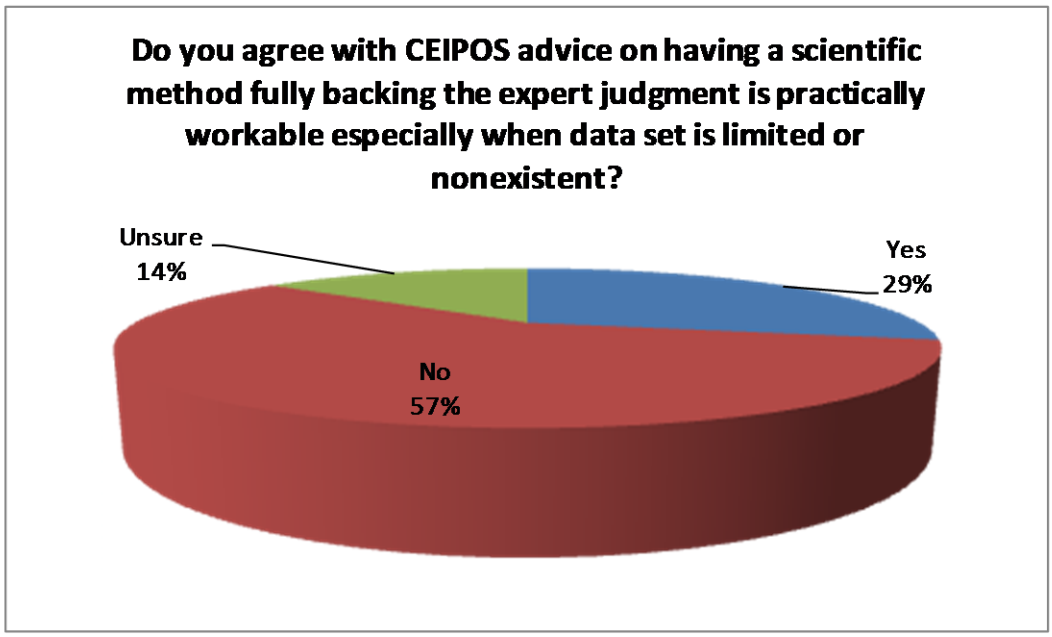

Do you consider the misspecification issue is significant enough such that companies using internal models (e.g. grid copula based approaches) will be at a disadvantage in terms of capital requirements from the firms using standard formulae approach?
Unsure
29%
Yes
28%
No
43%

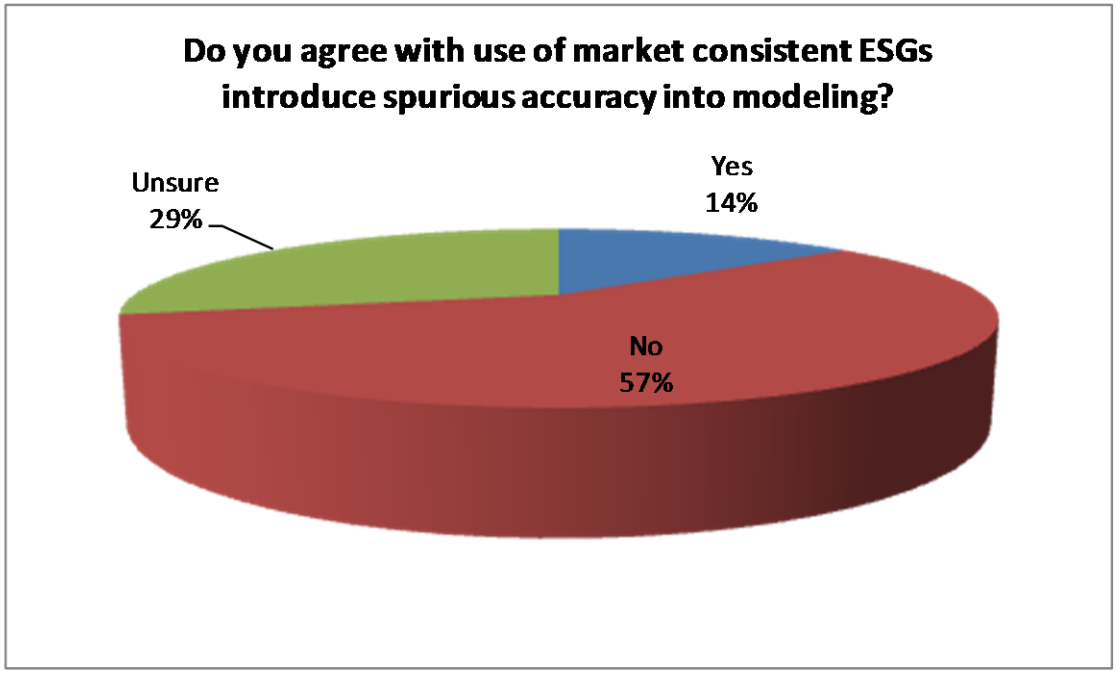

Do you consider use of standard formulae should be allowed for certain non complex and short duration insurance contracts only?
Unsure 29%
Yes 43%
No 28%

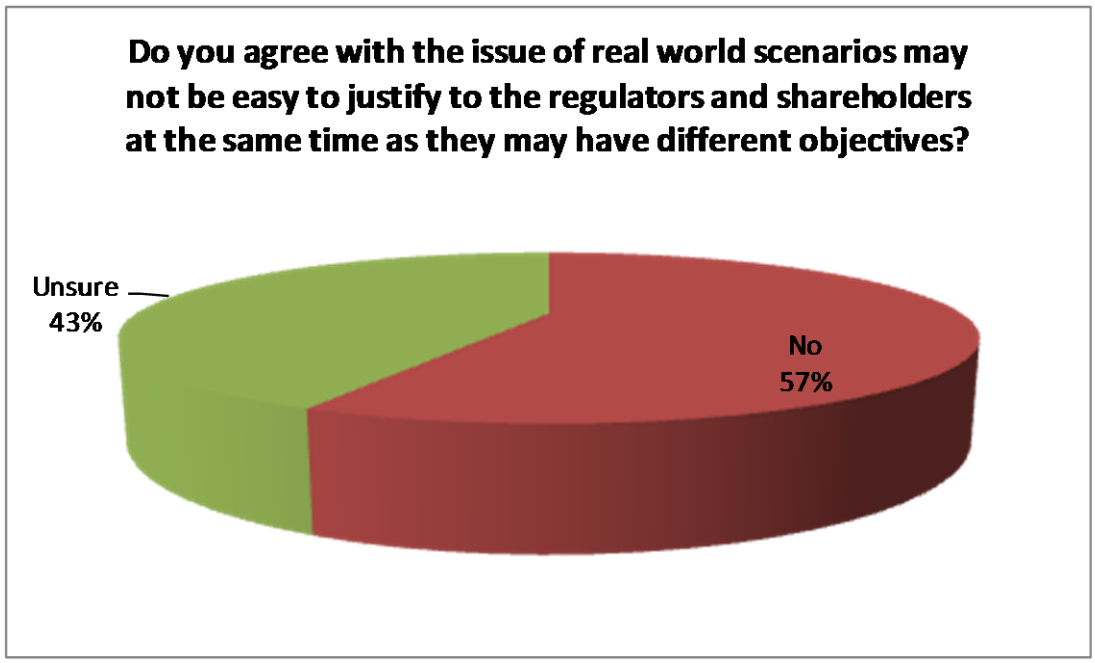

Do you consider companies will be able to use Internal Models in the day to day decision making process realistically?
No 14%
Yes 86%

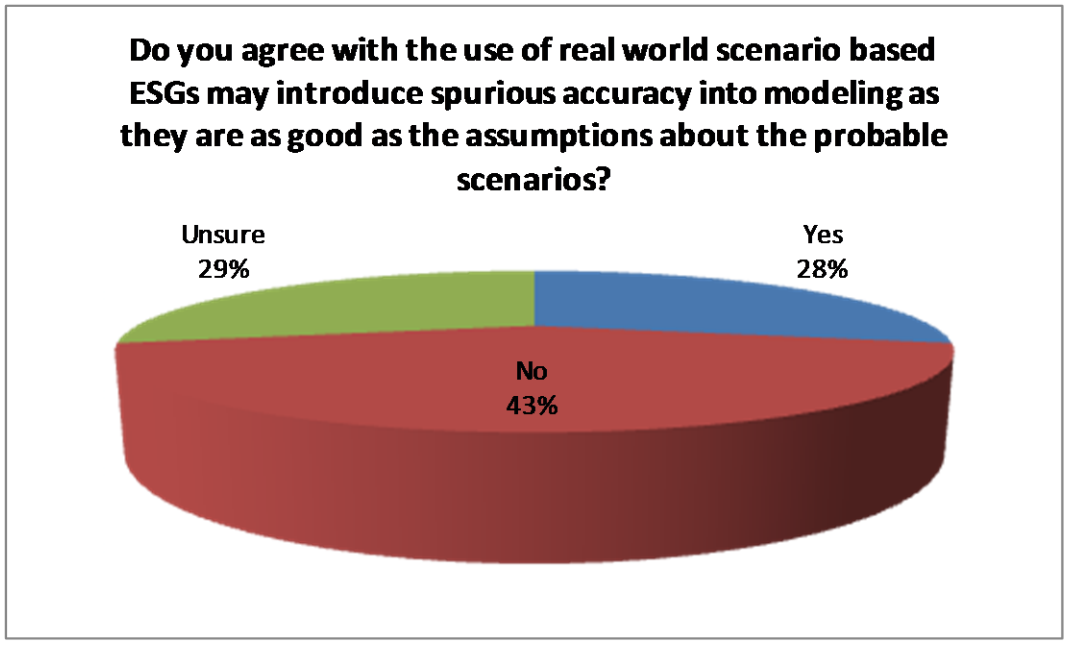

Do you see success of such wide scoped internal model in handling the overall risk of the insurer is practically achievable?
No
14%
Yes
86%

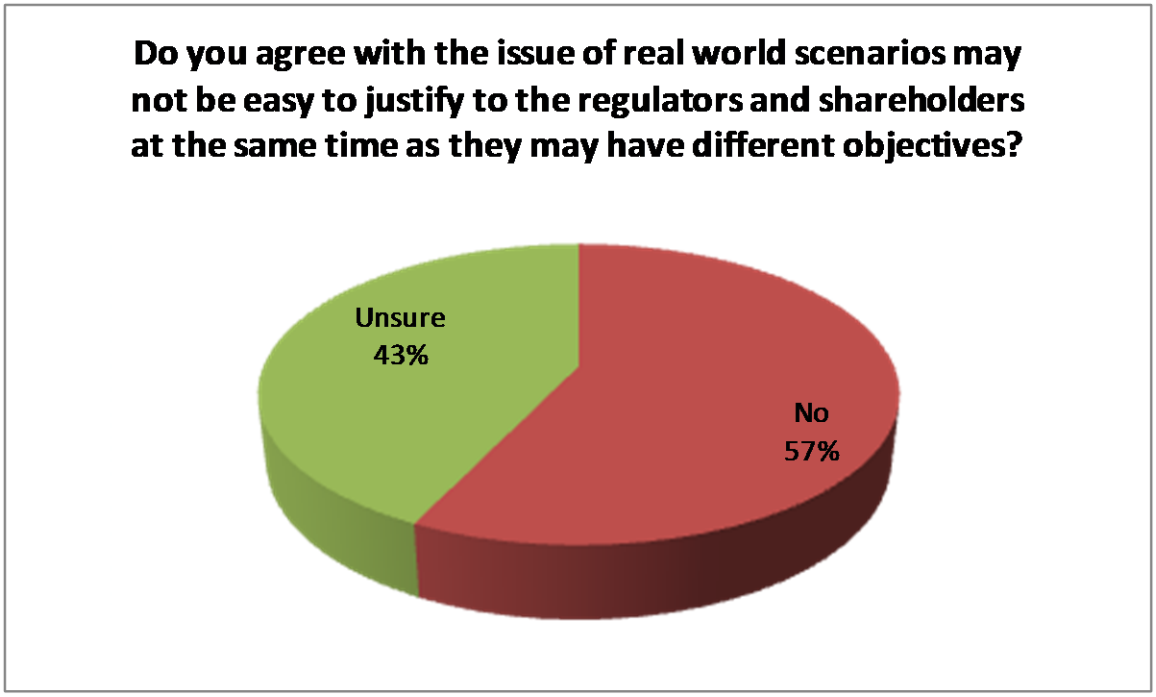

Do you agree with CEIOPS advice on having a known error rate in the expert judgment is practically workable?
Unsure
14%
No
86%


Do you agree with CEIPOS advice on having a scientific method fully backing the expert judgment is practically workable especially when data set is limited or nonexistent?
Unsure 14%
Yes 29%
No 57%


Do you agree with use of market consistent ESGs introduce spurious accuracy into modeling?
Unsure 29%
Yes 14%
No 57%


Do you agree with the issue of real world scenarios may not be easy to justify to the regulators and shareholders at the same time as they may have different objectives?
Unsure
43%
No
57%


Do you agree with the use of real world scenario based ESGs may introduce spurious accuracy into modeling as they are as good as the assumptions about the probable scenarios?
Unsure
29%
Yes
28%
No
43%


Do you agree with the issue of real world scenarios may not be easy to justify to the regulators and shareholders at the same time as they may have different objectives?
Unsure
43%
No
57%

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