The Solvency II ORSA Process

November 2010

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A note on terminology in this paper

SCR:

In this paper we use the term "SCR" to denote the Solvency Capital Requirement under Solvency II.

The SCR will be calculated using either the standard formula, with or without undertaking specific parameters (USP's) or an internal model (full or partial).

Standard SCR

The "Standard SCR" denotes the SCR calculated using the standard formula, without the application of any USP's.

Model SCR

The "Model SCR" denotes the SCR calculated using a full or partial internal model, or using the standard formula with USP's.

The views expressed in this paper are those of the authors do not necessarily reflect the views of their employers or of the Society of Actuaries in Ireland.

1.0 Introduction

The implementation date for Solvency II comes ever closer, and minds are focussing on the detailed implementation at this stage. One of the key elements of the new regime is the Own Risk and Solvency Assessment (ORSA).

The purpose of this paper is to serve as a resource and learning tool for the members of the Society of Actuaries in Ireland as they make their preparations for Solvency II.

In writing this paper the working group set itself the following terms of reference.

Terms of Reference:

To produce and present a paper for the members of the Society of Actuaries in Ireland which:

- *Reviews the existing literature on the ORSA process.*
- *Explains the ORSA process and its place in the Solvency II regime.*
- *Discusses the role of the actuary in the ORSA, covering both Life and Non-Life practice areas.*
- *Outlines the potential contents of the ORSA process.*

Our key objectives for this paper were to bring the ORSA to the attention of the wider actuarial community and to provide a single starting point for those who wish to get up to speed quickly.

At the time of writing the detailed "level 3" guidance has yet to be produced by CEIOPS, so the discussion in this paper is based mainly on the text of the Solvency II Directive itself and the ORSA Issues Paper produced by CEIOPS in 2008.

The Groupe Consultatif is developing its ideas and is expected to provide its input on level 3 guidance to CEIOPS in early 2011.

Section 2 discusses what the ORSA is, and how it might fit into the broader Solvency II risk-management framework.

Section 3 describes the interaction of the ORSA and the SCR, in particular the reasons why the risk assessment in the ORSA can differ from the "1 in 200" year view of the SCR. This section also considers the interaction of the ORSA with the internal model and the standard SCR formula.

Section 4 looks at the entity specific issues of proportionality and group ORSAs.

Section 5 outlines the role of the actuary in Solvency II, and in particular in the ORSA.

Section 6 provides a template for the contents of the ORSA process.

Section 7 provides a glossary of Solvency II terminology and acronyms for the uninitiated.

Appendix I contains a list of reference material relevant to the ORSA.

Appendix II outlines some analogous international regimes.

2.0 What is the ORSA?

The ORSA is a key element of the new Solvency II regime. Neither it, nor the wider Solvency II project, has been conceived in a vacuum. The thinking behind Solvency II is part of a wider process of development for insurance supervision and reflects ideas from (among others) the International Association of Insurance Supervisors (IAIS) and the International Actuarial Association (IAA).

We do not consider this wider context any further in the paper, but Appendix II, for the interested reader, contains an outline of some similar regimes that have been implemented internationally.

2.1 What does the ORSA Involve?

Article 45 of the Solvency II Directive requires that:

1. As part of its risk-management system every insurance undertaking and reinsurance undertaking shall conduct its own risk and solvency assessment. That assessment shall include at least the following:

(a) the overall solvency needs taking into account the specific risk profile, approved risk tolerance limits and the business strategy of the undertaking;

(b) the compliance, on a continuous basis, with the capital requirements, as laid down in Chapter VI, Sections 4 and 5 and with the requirements regarding technical provisions, as laid down in Chapter VI, Section 2;

(c) the significance with which the risk profile of the undertaking concerned deviates from the assumptions underlying the Solvency Capital Requirement as laid down in Article 101(3), calculated with the standard formula in accordance with Chapter VI, Section 4, Subsection 2 or with its partial or full internal model in accordance with Chapter VI, Section 4, Subsection 3.

2. For the purposes of paragraph 1(a), the undertaking concerned shall have in place processes which are proportionate to the nature, scale and complexity of the risks inherent in its business and which enable it to properly identify and assess the risks it faces in the short and long term and to which it is or could be exposed. The undertaking shall demonstrate the methods used in that assessment.

3. In the case referred to in paragraph 1(c), when an internal model is used, the assessment shall be performed together with the recalibration that transforms the internal risk numbers into the Solvency Capital Requirement risk measure and calibration.

4. The own-risk and solvency assessment shall be an integral part of the business strategy and shall be taken into account on an ongoing basis in the strategic decisions of the undertaking.

5. Insurance and reinsurance undertakings shall perform the assessment referred to in paragraph 1 regularly and without any delay following any significant change in their risk profile.

6. The insurance and reinsurance undertakings shall inform the supervisory authorities of the results of each own-risk and solvency assessment as part of the information reported under Article 35.

7. The own-risk and solvency assessment shall not serve to calculate a capital requirement. The Solvency Capital Requirement shall be adjusted only in accordance with Articles 37, 231 to 233 and 238.

The directive explains that the ORSA must include, at least, consideration of:

a) The undertaking's overall solvency needs, taking into account the specific risk profile, approved risk tolerance limits and business strategy.

b) Continuous compliance with the Solvency II requirements for technical provisions and solvency capital.

c) The degree to which the undertaking's risk profile deviates from the assumptions underlying the SCR, calculated with the standard formula or with its partial or full internal model.

The directive requires that the ORSA be an integral part of business strategy and be taken into account in strategic decision making. The ORSA should be performed annually or "*without any delay*" following any significant changes to the risk profile.

CEIOPS in their ORSA Issues Paper (May 2008) gives a succinct definition:

"the ORSA can be defined as the entirety of the processes and procedures employed to identify, assess, monitor, manage, and report the short and long term risks a (re)insurance undertaking faces or may face and to determine the own funds necessary to ensure that the undertaking's overall solvency needs are met at all times."

The key point here is that the ORSA is not a one-off exercise or a single report. Rather, it is a fundamental part of the risk management system for an insurance undertaking. In other words it could be defined as a documented process.

In addition to being an internal risk management process for an insurance undertaking, **the ORSA forms part of the supervisory process**. Article 45(6) of the Directive states that *"undertakings shall inform the supervisory authorities of the results of each own-risk and solvency assessment as part of the information reported under Article 35".* Paragraph 17 of the CEIOPS Issues Paper proposes that "*If the supervisory authority discovers issues that should have been determined in the ORSA, not only must the supervisor take action according to the deficiencies but it also has to assess the reason why the issues were not identified by the undertaking itself. The non-identification of issues in the ORSA may prove to be of just as much concern to supervisors as the issues themselves*."

Where an internal model is used, the **ORSA must include an analysis of the differences in assumptions and outputs between the Model SCR and Standard SCR**. The interaction between the ORSA and the internal model/standard formula is discussed further in §3.2 and §3.3.

The directive also requires that the ORSA be **proportionate to the nature, scale and complexity of the risks** inherent in the business. The ORSA should enable an undertaking to properly identify and assess the risks it faces in the short and long term and to which it is or could be exposed. The proportionality principle is discussed further in §4.1.

The directive also makes it clear in Article 45(7) that **the ORSA does not itself create a further capital requirement.**

The CEIOPS Issues Paper provides five principles which should be observed in respect of the ORSA:

a) The ORSA is the responsibility of the undertaking and should be regularly (at least annually) reviewed and approved by the undertaking's administrative or management body.

b) The ORSA should encompass all material risks that may have an impact on the undertaking's ability to meet its obligations under insurance contracts.

c) The ORSA should be based on adequate measurement and assessment processes and form an integral part of the management process and decision making framework of the undertaking.

d) The ORSA should be forward-looking, taking into account the undertaking's business plans and projections.

e) The ORSA process and outcome should be appropriately evidenced and internally documented as well as independently assessed.

Thus while the ORSA is a process rather than a report, **it will need to be evidenced by appropriate documentation.** The CEIOPS Issues Paper states that "*the undertaking should ensure that the ORSA can be easily reviewed by the supervisory authority as part of the Supervisory Review Process.*"

2.2 Who owns the Process?

Under Solvency II insurance undertakings are required to have a risk-management function and an actuarial function.

Article 44(4) of the Directive requires that "*undertakings shall provide for a risk-management function which shall be structured in such a way as to facilitate the implementation of the risk-management system*".

The risk-management system comprises strategies, processes and reporting procedures necessary to identify, measure, monitor, manage and report, on a continuous basis the risks, at an individual and at an aggregated level, to which the undertaking could be exposed, and their interdependencies.

The role of the actuarial function is described in Article 48. In addition to the actuarial functions role in respect of technical provisions, opining on overall underwriting policy, and the adequacy of reinsurance arrangements the actuarial function will "*contribute to the effective implementation of the risk management system…, in particular with respect to the risk modelling underlying the calculation of the [SCR] and to the [ORSA]"*. **Thus the ORSA is seen in the Directive as part of the risk management system.**

CEIOPS' Issues Paper states that "*although the execution of the ORSA as such can be outsourced, the administrative or management body remains responsible for the compliance with the requirements of the ORSA and with Article 48 of the Framework Directive Proposal, as well as for the management decisions required as part of the risk and capital management to which the ORSA relates.*"

CEIOPS requires that "*the administrative or management body shall ensure that a regular assessment of the ORSA process is performed by persons that have not been responsible for the part of the ORSA process they review and who are thus independent in their assessment.*"

The assessment may be conducted by an internal or external auditor or any other skilled internal or external function, as long as they are independent in their assessment task.

The conclusions drawn from the independent assessment should be reported to the administrative or management body in order to enable it to act on this information if necessary.

2.3 Roles for the Actuarial Function and Actuaries Generally

The directive describes the actuarial role in Article 48 as follows:

> *1. Insurance and reinsurance companies shall provide for an effective actuarial function to:*
>
> *(a) coordinate the calculation of technical provisions;*
>
> *(b) ensure the appropriateness of the methodologies and underlying models used as well as the assumptions made in the calculation of technical provisions;*
>
> *(c) assess the sufficiency and quality of the data used in the calculation of technical provisions;*

(d) compare best estimates against experience;

(e) inform the administrative, management or supervisory body of the reliability and adequacy of the calculation of technical provisions;

(f) oversee the calculation of technical provisions in the cases set out in Article 82;

(g) express an opinion on the overall underwriting policy;

(h) express an opinion on the adequacy of reinsurance arrangements; and

(i) contribute to the effective implementation of the risk-management system referred to in Article 44, in particular with respect to the risk modelling underlying the calculation of the capital requirements set out in Chapter VI, Sections 4 and 5, and to the assessment referred to in Article 45.

2. 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 risks inherent in the business of the insurance or reinsurance undertaking, and who are able to demonstrate their relevant experience with applicable professional and other standards.

The directive clearly sees a role for the actuarial function in contributing to the risk-management system. The ORSA involves a high degree of quantitative assessment which actuaries are well placed to perform or to validate.

Solvency II, and the ORSA in particular, also offers opportunities for actuaries to get involved in the wider management of insurance entities.

The role of actuaries in the ORSA is discussed further in §5.

2.4 Commonalities and Differences for Life/Non-Life/Reinsurance

While the application of the ORSA needs to take into account the nature, scale and complexity of the particular insurance undertaking, the principles behind the ORSA are common across Life and Non-Life insurers and Reinsurers. In the literature to date there is little, if any, differentiation between types of insurers in discussion of the ORSA.

ASP LA 2 (Actuarial Financial Condition Reports, FCR) states that the purpose of current FCR required of Irish regulated Life insurers is to "*identify plausible threats to satisfactory financial condition, actions that lessen the likelihood of those threats, and actions that would mitigate a threat if it materialised*". The ASP goes on to say "*as such, a Report serves a critical governance function by enabling the Board and management of the Company concerned to focus on its future risk profile and on the risk management options available.*"

Clearly the Life FCR will be a useful starting point for life insurers considering what will constitute their ORSA process.

2.5 Available Literature

Solvency II is being implemented using the "Lamfalussy Process". Under this process, EU legislation is composed of four "levels", each focusing on a specific stage of implementation.

At the first level, the EU parliament and Council adopt a piece of basic legislation. In the case of Solvency II this is the Directive.

At the second level sector-specific committees and regulators advise on technical details, and these are agreed at the EU Commission. For Solvency II this has involved CEIOPS producing its advice on level 2 implementing measures for adoption by the Commission.

At the third level, national regulators and sector specific committees aim to promote supervisory convergence and best practice, principally through the creation of non-legally binding guidance.

Finally, level 4 involves compliance and enforcement of the new legislation.

In the case of ORSA there are references in the level 1 directive text, but there are no level 2 implementing measures. It is planned that further guidance will be provided at level 3, and this is expected in 2011.

The main reference materials for the ORSA are set out in Appendix I.

3.0 Interaction with the Internal Model/Standard Formula

3.1 Why might the ORSA view of Capital differ from the SCR?

In the ORSA process each undertaking needs to consider its own assessment of its capital needs. As such, undertakings should consider the capital required to satisfy their chosen risk tolerance and support their future business plans. This capital assessment would be derived from an economic assessment of the undertaking's risks, allowing for risk mitigation strategies and business plans. The capital assessed in such a way is commonly termed the "economic capital".

It is important to differentiate "economic capital" from the "regulatory capital" (i.e. the SCR) with which undertakings are required to maintain continuous compliance under the Solvency II regime.

These two concepts of capital will commonly differ. For example, the SCR is based on a 0.5% VaR measure over a one year horizon, whereas an undertakings internal risk tolerance may require a different combination of probability of ruin, risk measure and time horizon.

The SCR is also a point in time calculation whereas the economic capital assessment is an assessment of evolving capital needs over the planning horizon. As such the economic assessment will allow, for example, for future business volumes, proposed rating activity, potential acquisitions, newly raised equity or subordinated loan capital, dividend policy and so forth.

The economic capital assessment will also allow for risks not explicitly allowed for in the SCR, such as liquidity risk, legal/political risks and reputational risks.

Being a wider concept than the SCR, it is likely that the economic capital will be greater than the regulatory capital. **However, it is important to remember that the directive is clear that ORSA does not of itself serve to create an additional regulatory capital requirement.**

In meeting its economic capital needs the undertaking can take account of future earnings, scheduled capital injections, use of subordinated loans and sales of business activities. Thus although the ultimate economic capital might be greater than the current regulatory SCR, the actual economic capital required at the time of the ORSA valuation may be less due to the expected future sources of capital.

The purpose of the ORSA is that undertakings should understand both their regulatory and economic capital requirements and have a framework in place to:

- Ensure continuous compliance with the regulatory requirement.
- Plan and monitor the evolution of their economic capital requirement.

This framework or "Capital Plan" would be at the heart of the ORSA process. In the Capital Plan an undertaking would demonstrate, over the given projection period, how it expects to maintain the required regulatory capital and generate the economic capital to support its business plans.

3.2 ORSA and the Standard Formula

The Directive (Article 45(1)(c) and articles 103-111) requires that undertakings using the standard formula should evaluate the appropriateness of applying the standard formula in their particular case. This might be achieved through consideration of questions such as:

- How well does the standard formula capture the specific risks of the undertaking?

  This analysis could be done on a module by module basis considering whether the results of applying the standard formula represent an appropriate assessment of the undertakings own risks.

- How sensitive are the results of the standard formula to changes in the mix of risks, and the impact of reinsurance and other risk mitigation methods?
- How do the results differ between the standard SCR and the SCR calculated using Undertaking Specific Parameters (where this is the case)?
- What is the justification for any USP's that have been applied?

  This justification would require a discussion and analysis of the data used to derive USP's and the method used to calculate the final parameters.
- What is the rationale for any simplifications that have been employed?

  In this regard we would propose a discussion of how simplifications are justified by the nature, scale and complexity of the risks and an assessment of the likely impact of applying such simplifications.

3.3 ORSA and the Internal Model

The Directive requires that undertakings using a full or partial internal model for their regulatory capital calculations, should evaluate the appropriateness of the model and assumptions (Article 45(1)(c) and articles 112-127).

There are several threads to such an evaluation:

Model Governance and Scope

Here the undertaking should consider issues including:

- Does the model continue to meet the key requirements that it reflect the risk profile of the company and meet the "use test"?
- What changes/improvements have been made since the last review? How have these changes been implemented?
- What modelling weaknesses have been identified? What future model changes are proposed?
- What new or emerging risks have been identified? Will these form part of the internal model and if not why not?

Model Calibration and Statistical Quality

The ORSA should include:

- A discussion and analysis of the data used to parameterise the model and of the statistical methods used to calibrate the model parameters.
- A verification of the model calibration against suitable benchmark portfolios.

Model Outputs

Undertakings should explain:

- What are the key reasons for differences between the model SCR and the SCR calculated using the standard formula.
- How sensitive are the model outputs to changes in the mix of risks, and the impact of reinsurance and other risk mitigations?

Reconciliation of Economic to Regulatory Capital

The ORSA would also explain how economic capital and regulatory capital can be reconciled via changes to the calibration of the internal model. Whereas firms could use the model calibration of their choice for the ORSA (to facilitate the Use Test and ensure it truly reflected the management view) it is likely that the undertaking would need to explain any differences in the calibration and the reasons for any deviations from the regulatory internal model.

It is also possible that a company might use the Standard Model for its regulatory capital assessment but use an internal model in its ORSA when determining its own economic capital needs. Such a model would not need supervisory approval for that purpose. However, an insurer would be expected to review its own internal model and validate it so as to satisfy itself of the appropriateness of the model for use as part of its risk and capital management processes. However such action might indicate that the company should be considering the incorporation of USPs or even partial models into its regulatory standard model.

4.0 Entity Specific Considerations

4.1 Proportionality

4.1.1 The Directive

The issue of proportionality in relation to the ORSA is specifically referred to in the Solvency II Directive.

Article 45(1)(a) of the Directive states that the ORSA shall include at least "*the overall solvency needs taking into account the specific risk profile, approved risk tolerance limits and the business strategy of the undertaking*".

Article 45(2) goes on to state that *"for the purposes of paragraph 1(a)*[above] *the undertaking concerned shall have in place processes which are proportionate to the nature, scale and complexity of the risks inherent in its business and which enable it to properly identify and assess the risks it faces in the short and long term and to which it is or could be exposed. The undertaking shall demonstrate the methods used in that assessment."*

4.1.2 CEIOPS Issues Paper

Paragraph 2 of the CEIOPS Issues Paper on ORSA states that there is a perception that undertakings may view the ORSA as requirements for a process with a degree of complexity and sophistication far in excess of what the European Commission and CEIOPS actually envisage.

Paragraph 3 goes on to recognise that "*uncertainty about what will be expected of undertakings in the performance of the ORSA raises concerns, especially for small and medium-sized undertakings, of very demanding requirements. Aware of these concerns, the European Commission has sought to address the main doubts and has stated, in the Explanatory Memorandum to its Framework Directive Proposal, that the ORSA:*

- *Does not require an undertaking to develop an internal model.*
- *Is not a capital requirement different from the SCR and the MCR.*
- *Should not be too burdensome."*

The issue of proportionality is specifically referred to in paragraph 18 and 19.

Paragraph 18 states that *"the ORSA may take different levels of sophistication according to the nature, complexity and scale of the risks inherent in the business, ranging from simple stress test calculations on the material risks to the use of more advanced methodologies similar to the ones used in partial or full internal models. While there may be undertakings using the SCR standard formula for which, owing to their size and complexity, the ORSA process necessitates a design not far removed in sophistication from an internal model, this will not apply to all undertakings. Standard formula users with less complex risk profiles may use less sophisticated tools to implement the ORSA.*"

Paragraph 19 states that "*it should be recognised that the ORSA exercise could promote the use of more sophisticated methods, since it requires undertakings to become more cognizant of the interrelationships between the risks within their business and their overall solvency needs. It can be expected that, with this increased insight, undertakings will seek to improve their ability to assess and manage their risks and control their overall solvency needs and thus enhance their efficiency by introducing more advanced processes, methods and techniques.*"

4.1.3 Groupe Consultatif

In their comments responding to the CEIOPS Issues Paper, the Groupe Consultatif state that they believe that *"firstly the principles of ORSA should be developed, and then each undertaking performs its ORSA taking into account the proportionality principle".*

The key point is that it would not be appropriate to have different principles for a small or large insurer but instead the same principles should be used and applied in a proportionate manner.

4.2 ORSA and Groups

Although Solvency II allows groups to apply for "Centralised Risk Management" this does not mean that there will be just one ORSA for the group as a whole. Each regulated entity within an insurance group will still be required to have its own ORSA.

However it is possible, irrespective of whether the group operates "Centralised Risk Management", to have a single documented process for all of the ORSAs within a group.

4.2.1 The Directive

Article 246 of the Directive deals with the supervision of the system of governance and makes specific reference to the ORSA.

The opening paragraph of Article 246 states that "… *the risk management and internal control systems and reporting procedures shall be implemented consistently in all the undertakings included in the scope of group supervision pursuant to Article 213(2)(a) and (b) so that those systems and reporting procedures can be controlled at the level of the group*".

Article 246(4)(sub-paragraph 1) states that "*Member States shall require the participating insurance or reinsurance undertaking or the insurance holding company to undertake at the level of the group the assessment required by Article 45 [i.e. the ORSA]. The own-risk and solvency assessment conducted at group level shall be subject to supervisory review by the group supervisor in accordance with Chapter III*".

Article 246(4)(sub-paragraph 3) states that "*where the participating insurance or reinsurance undertaking or the insurance holding company so decides, and subject to the agreement of the group supervisor, it may undertake any assessments required by Article 45 at the level of the group and at the level of any subsidiary in the group at the same time, and may produce a single document covering all the assessments*".

Article 246(4)(sub-paragraph 5) states that "*Where the group exercises the option provided in the third sub-paragraph, it shall submit the document to all supervisory authorities concerned at the same time. The exercise of that option shall not exempt the subsidiaries concerned from the obligation to ensure that the requirements of Article 45 are met*"

4.2.2 The ORSA process at Group Level

In the Groupe Consultatif's response to the CEIOPS Issues Paper on ORSA they state that the ORSA for groups certainly needs additional work. The Groupe Consultatif believe that a good starting point for the group ORSA would be to firstly develop a solo ORSA, and then to add relevant group specific elements to it.

They go on to clarify that "*This is not meant to mean, however, that in groups there should first be solo ORSA's and the group ORSA would be a collection of these with the group-specific elements added. Instead only the group ORSA should be performed, taking into account the need to handle the issues specific to the group structure accordingly.*"

In January 2010 CEIOPS published 'CEIOPS Advice for Level 2 Implementing Measures on Solvency II: Supervision of Group Solvency for Groups with Centralised Risk Management' (former CP 66). This paper deals with features of the ORSA process to be considered at Group Level (1.13, 3.27, 3.53 and 3.87).

In this paper, CEIOPS describes two levels of group risk management[1]:

[1] A useful summary of the differences in these approaches is set out in Annex 1 to the level 2 implementing measures *"Comparison of requirements between consistent group wide risk management and centralised risk management"*

- Firstly, there is a requirement for a consistent group wide risk management as stated in Article 246(1). This applies to all groups.
- Secondly, there is the concept of Centralised Risk Management. This is a regime linked to the application of Article 236.

Based on Article 246(4) of the Directive, groups may apply for a single group wide ORSA independently of having applied for a Centralised Risk Management under Article 236. However, as per Article 246(4)(sub-paragraph 5) the subsidiary will not be exempt from the obligation to ensure that the requirements of Article 45 are met.

CEIOPS then advises that:

- Under consistent group wide risk management; the ultimate parent undertaking should develop an appropriate ORSA process at group level and undertake at the level of the group this assessment as required by Article 246(4)(sub-paragraph 1). According to Article 246(4)(sub-paragraph 3), it is also possible to have one document covering the assessment on solo and group level.
- Under centralised risk management; the ultimate parent undertaking shall undertake the ORSA at the level of the group and at the level of all subsidiaries forming part of a group with centralised risk management at the same time and shall produce a single document covering all the assessments as indicated in Article 246(4)(sub-paragraph 3).

It is expected that CEIOPS will develop additional guidance on the group ORSA requirements at level 3.

5.0 The Role of the Actuary in the ORSA

5.1 The Role of the Actuary in Ireland today

5.1.1 Life Assurance and the Appointed Actuary

Today, actuaries in Ireland fulfil a wide range of functions in life assurance. They are involved in valuation and reserving work, premium setting, capital management, risk management, financial forecasting and product development, indeed in all aspects of the financial management of life assurance companies. In addition, the position of Appointed Actuary has a special role under Irish legislation and practice.

Both the Board and the Financial Regulator place considerable reliance on the Appointed Actuary who:

- Must certify the company's technical reserves and state of solvency.
- Confirm that new business premiums are sufficient.

The Appointed Actuary also has a professional duty to inform the Board of any potential concern as to the company's developing financial position and to prepare, on specified occasions, an Actuarial Financial Condition Report for submission to the Board and to the Financial Regulator to establish the sensitivity of the company's financial condition to changes in assumptions. The Actuarial Financial Condition Report serves a critical governance function by enabling the Board and management of the company to focus on its future risk profile and on the risk management options available.

Other duties of the Appointed Actuary relates to disclosure of information to policyholders and to the interpretation of "policyholders' reasonable expectations" (PRE).

The Appointed Actuary has direct access to the Board and the Financial Regulator for consultation, and the Society of Actuaries in Ireland has issued Actuarial Standards of Practice specifically related to the role of the Appointed Actuary.

5.1.2 Non-Life Insurance and the Signing Actuary

Today, the regulatory role of non-life actuaries in Ireland is limited in scope to the certification of reserve provisions. There is no duty of care to policyholders or requirement to interpret policyholder reasonable expectations.

Although the regulatory role of actuaries in non-life insurance is limited, in practice actuaries take part in a wide variety of roles such as pricing, financial planning, capital management, reinsurance analysis, investment and wider company management.

5.2 Role of the Actuary under Solvency II

Under Solvency II the formal roles of the Appointed Actuary and Signing Actuary will no longer exist and as a result the role of actuaries will be significantly different to what it is today.

Technically there is no formal requirement for "actuaries" (in the sense of professionally qualified members of an actuarial association) although the term "actuarial" is prominent throughout the Directive.

Clearly there is a direct fit between the role of the actuarial function and the "actuary", and inevitably as companies look for particular skill-sets, and boards look to ensure that they have adequately resourced their companies with suitably skilled staff, they will turn to actuaries to be involved where appropriate.

Some of this will be because the tasks are essentially actuarial and in other areas it will be because an actuarial background or training is useful in terms of:

- Understanding of, and holistic view of risk.
- Understanding of life and non-life business and the risks involved.
- Experience and business awareness of insurance in general.

5.3 The role of the actuarial function in the ORSA and Risk Management

The directive sets out the role of the actuarial function in Article 48, as quoted in §2.3 above.

In addition to responsibilities in relation to the technical provisions, and the requirements to express opinions on underwriting policy and reinsurance arrangements, the directive requires the actuarial function to

(i) contribute to the effective implementation of the risk-management system referred to in Article 44, in particular with respect to the risk modelling underlying the calculation of the capital requirements set out in Chapter VI, Sections 4 and 5, and to the assessment referred to in Article 45.

Article 48(1)(i), sees one of the roles of the actuarial function as contributing to:

- The implementation of the risk management system.
- The calculation of the SCR.
- The ORSA (*"the assessment referred to in Article 45").*

Thus while the ORSA as a process sits within the ambit of the risk management function (as discussed in §2.2), the directive sees a clear role for the actuarial function in contributing to the process.

As a result, a significant proportion of the ORSA will be produced by the actuarial function.

The following paragraphs, which discuss aspects of the ORSA which would sit with the actuarial function, are taken from the 2008 CEIOPS Issues Paper on the ORSA.

"The purpose of the ORSA is to ensure that undertakings have robust processes for assessing and monitoring their overall solvency needs.

An undertaking should not only assess its current risks but also the risks it faces in the long term. That means that long term projections of the business which are a key part of any undertaking's financial planning, such as projections of business plans, economic balance sheet and profit and loss account, are required. These projections should feed into the ORSA in order to enable the undertaking to form an opinion on the future overall solvency needs and own funds. Suitable capital planning should include projections of capital requirement and own funds (e.g. raising new own funds). It is up to the undertakings to decide on reasonable assumptions, parameters, correlations or levels of confidence to be used in the projections.

Although an undertaking, in performing its ORSA, may for its own business purposes use a confidence level or a time horizon that differs from that of the SCR calculation, it is also required to perform the internal calculation on the basis of a 99.5% confidence level and a one-year time horizon, in order to assess the deviation of its risk profile from the assumptions underlying the SCR calculation.

Under the ORSA an undertaking should use the parameters that in its opinion best reflect its individual risk situation.

An internal model is in itself a tool for the ORSA. For an undertaking using an internal model to calculate the SCR, the ORSA should include a description of the role of the internal model in the integrated management of risk and capital needs. An undertaking should be able to *justify the continued adequacy of the model compared with the risk profile of the undertaking."*

The ORSA will likely be more comprehensive than the current life FCR process. It will also be built around a more dynamic and complex measure of risk capital. For all that, many of the core aspects of the ORSA will reflect the approach to risk management and process that underlies the current FCR.

In the wider risk management function there is also a clear role for the actuarial function to contribute to:

- Underwriting and Pricing.
- Investment, Liquidity and Asset Liability Modelling.
- Reinsurance and risk-mitigation.
- Partial or full internal models.

5.4 The Role of actuaries in a Solvency II world

The actuarial profession can provide an essential contribution to risk management as evidenced by the directive and the draft implementing measures. Today actuaries' core responsibilities are typically related to risks such as insurance risks, market risks or counterparty (reinsurer) default risks. Many actuaries are also involved in the development of internal models.

Actuaries, as part of the actuarial function, can contribute to the ORSA process given their quantitative understanding of insurance risks and also other quantifiable risks like market risks and counterparty default risks.

Actuaries are respected as leaders in quantitative understanding of insurance risks. Moreover, the role of the actuaries is central in asset liability management especially related to participating business or products with embedded options.

It is clear that, although the current statutory roles will cease to exist, the need for actuarial expertise will perhaps be greater than at present. A key challenge for companies will be the definition and delineation of the roles and responsibilities which will form part of the ORSA process.

A final aspect which is not to be overlooked however is the area of PRE. While a detailed implementation plan for Solvency II will lead many life insurers to map most of the current Appointed Actuary responsibilities onto alternative structures under solvency II, it is not clear where the responsibilities for PRE will lie, and so it will be incumbent on the board to ensure that this is appropriately considered.

6.0 Outline of the contents of the ORSA Process

Actuaries are naturally drawn to Pillar I of Solvency II which covers the quantitative aspects of the new regime. However, Pillar II (Internal Controls and Supervisory Review) and Pillar III (disclosure) are every bit as important.

In the context of the ORSA, the importance of Pillars II and III is clearly demonstrated when we compare the list of potential risks falling under Pillar I with those that don't.

Pillar 1 Risks	***Other Risks***
Market risk	*Liquidity risks*
Insurance risks	*Management risks*
Counterparty default risks	*Future earnings risks*
Operational risks	*Resourcing and skillbase risks*
	Legal risks
	Social changes
	Economic cycles
	Technological changes
	Reputational risks
	Political risks

In March 2009 the International Actuarial Association (IAA) published its "*Note on Enterprise Risk Management for Capital and Solvency Purposes in the Insurance Industry*".

The tables below draws heavily on the ideas of the IAA. ***These tables are however intended to provide only an outline, as opposed to a detailed and exhaustive description, of the ORSA's contents.***

GOVERNANCE (Mostly Pillar II)

System of Governance	Review system of governance taking into account the company's specific risk profile	Assess adequacy/appropriateness/ compliance with: • General governance (Article 41) • Risk management systems (Article 44) • Internal control framework (Article 46) • Fit and proper requirements (Article 42) • Compliance function (Article 46 par 2) • Internal audit (Article 47) • Outsourcing (Article 49) Review/ Update documentation of: • Organisation Structure • Board/Officers/Function Holders • Business Strategy and Objectives

RISK MANAGEMENT (Mostly Pillar II)

Risk Management Framework **&** **Risk Management Policy**	Review the application of Enterprise Risk Management (ERM)	Independently (internal or external) assess the processes around ERM: • Risk management culture • ERM responsibilities and reporting • ERM in Business Planning • ERM in New Activities • Risk Identification and Assessment • Application of Proportionality • Stress and Scenario Tests • Performance management/reward systems (should include an ERM component) • ERM Documentation Review overall risk management policy including: • Minimum requirements for the management of the portfolio of risks • Statement of the insurers risk appetite • Procedures for the conduct of the ORSA
Risk Identification And Assessment	Formal Process to Review Risks	• Existing and Emerging Risks o Underwriting o Catastrophe o Market o Counterparty Default o Operational o Liquidity o Reputational o Strategic o Group Risks o Political • Qualitative & quantitative assessment • Assess Materiality / Heat Map • Assess whether necessary to model
Risk **Tolerance**	Review/amend the stated risk tolerance with reference to planned business strategy	• Review risk limits at a risk category level • Review processes to ensure that the company behaves within the stated risk tolerance

UNDERWRITING (Mostly Pillar I)

Underwriting Policy	Evaluate overall underwriting policy for main lines of business insofar as it affects the solvency of the company.	• Claims Experience • Expenses • Business Volumes • Policy Wordings / Risk Mitigation • Consideration of any additional local legislative requirements for Life or Non-Life Insurance contracts.[2]

Reinsurance Policy	Review Reinsurance Policy	• Overall Reinsurance Strategy
		  ○ Types of Cover
		  ○ Treaty / Facultative
		  ○ Limits
		  ○ Cost
		  ○ Security
		  ○ Processes
		• Review of Security of Counterparties
		• Reinsurance by Line of Business

INVESTMENT (Mostly Pillar II)

Investment Policy	Review Investment Policy	• Overall Investment Policy
		  ○ Asset Classes
		  ○ Limits / Diversification
		  ○ Matching
		  ○ Derivatives
		• Review of Security of Counterparties
		• Processes
		• Breaches
		• Review processes to ensure that the company behaves within the stated risk policy
		• Process links with underwriting, reserving and reinsurance risks

[2] For example, in the Irish context this might involve consideration of PRE for Life Insurance contracts; How does the board determine PRE, and how is PRE allowed for in technical reserves?

TECHNICAL PROVISIONS (Mostly Pillar I)

Technical Provisions	Evaluate Reliability and Adequacy of Technical Provisions	• Data • Techniques Applied • Assumptions

SOLVENCY (Mostly Pillar I)

Current Solvency Position	Calculation of Current Statutory Solvency Position	• SCR • MCR • Capital Position
Overall Solvency Needs	Projection(s) of overall solvency needs. Should be integrated part of planning process.	Stochastic or Deterministic + Stress Tests Include Sensitivity Tests Allow for • Company's Planning Horizon • Risk Profile • Risk Tolerance • Business Strategy • Management Actions Consider all material risks
Continuous Compliance with Capital Requirements	"Capital Plan" A clear plan for continuous compliance with capital requirements and technical provision requirements Plan regularly reviewed / revised as part of the ORSA process.	Plan should demonstrate ability to generate the economic capital required to support its business plans. Possible sources of economic capital: • Company's Planning Horizon • Future earnings • Injection of capital • Taking up subordinated loans • Sales of business activities

SOLVENCY Continued

Assessment ofRisk Profile (Standard Model)	If using Standard Formula	Evaluate the appropriateness of applying the standard formula • Describe Co's Risk Profile including any emerging risks • Rank the modules in terms of the Co's risks. • Analyse SCR Sensitivities; e.g. reinsurance, diversification, etc • Analyse appropriateness of any underwriter specific parameters • Justify any simplifications by reference to nature scale and complexity.
Assessment of Risk Profile (Full or Partial Internal Model)	If using a full or partial Internal Model	Evaluate the use of the Internal Model or Partial Model • Describe Co's Risk Profile • Description of Model and Model Governance • Review of Risks Covered/Not Covered by Model • Assessment of Emerging Risks • Review Statistical Quality of Model • Review Calibration of Model • Review Profit and Loss Attribution • Analyse performance of model and weaknesses/areas for development • Review use of Standard Formula Modules where applicable. • Review performance versus Use Test • Analyse SCR vs Model SCR • Analyse Model SCR v Group SCR

ADDITIONAL AND EXTERNAL RISKS (Mostly Pillar II)

Liquidity risks Management risks Future earnings risks Resourcing and skillbase risk Outsourcing risks Legal risks Social changes Economic cycles Technological changes Reputational risks Contagion Risks Political risks	In many cases these risks are not strictly quantifiable, but the ORSA needs to consider them and discuss how they are mitigated.	• Non SCR Risks and how they are considered and quantified • Review Breaches of Process and control of Outsourcing • Review engagement with Outsourcing

SUPERVISORY/REPORTING (Mostly Pillar III)

Supervisory Issues		• Review ORSA Submission Process (Part of RTS) • Review Breaches of Process • Review engagement with supervisors

7.0 Glossary

CEIOPS and EIOPC	*CEIOPS is the Committee of European Insurance and Occupational Pensions Supervisors* *It was established under the terms of the European Commission Decision 2004/6/EC of 5 November 2003, currently repealed and replaced by Decision 2009/79/EC, and is composed of high level representatives from the insurance and occupational pensions supervisory authorities of the European Union's Member States. The authorities of the European Economic Area Member States also participate in CEIOPS.* *As regards the insurance, reinsurance and occupational pensions markets, the European Insurance and Occupational Pensions Committee (EIOPC) is attached directly to the Commission as a body for reflection, while the Committee of European Insurance and Occupational Pensions Supervisors (CEIOPS) provides a link between the Commission and the public authorities in the Member States and ensures correct and uniform application of Community measures.*
EIOPA	*EIOPA, the European Insurance and Occupational Pensions Authority, is the successor body to CEIOPS, composed mainly of representatives from the national regulators. EIOPA has additional powers to: impose consistent application of EU law, settle disagreements between national regulators, impose actions in the event of a crisis, and draw up technical standards*.
IAIS	*International Association of Insurance Supervisors* *Established in 1994, the IAIS represents insurance regulators and supervisors of some 190 jurisdictions in nearly 140 countries.* *See http://www.iaisweb.org/*
Lamfalussy Process	*The process by which the Solvency II directive is being implemented using 4 levels. Originally developed in 2001, it is named after the chair of the EU advisory committee that created it, Alexandre Lamfalussy.*
Level 1 Text	*The Directive*
Level 2 Implementing Measures	*Further legally-binding guidance on the implementation of the directive*
Level 3 Guidance	*Guidance on the implementation of Level1 and Level 2 requirements.*
SCR	*Solvency Capital Requirement. The Regulatory Capital requirement in the Solvency II Regime.*

Appendix I: ORSA Reference Material

The main reference materials for the ORSA are set out below:

- SII Final Directive (November 2009)

  http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:335:0001:0155:EN:PDF

  Article 45 sets out the key requirements in respect of the ORSA.

- CEIOPS Issues Paper (May 2008)

  https://www.ceiops.eu/fileadmin/tx_dam/files/consultations/IssuesPaperORSA.pdf

  Paragraph 6 of this paper describes its purpose as follows: *"In this paper CEIOPS explains its preliminary views on the definition and importance of the ORSA as a management tool, the purpose of the ORSA, some requirements building on the Directive Proposal and some principles and guidance on the ORSA process. The guidance as set out in this document may yet be modified or amended before the introduction of the Solvency II framework, as the framework is being further developed. The present paper only considers the ORSA as a requirement on undertakings; issues related to how supervisors review the ORSA, the requirements on supervisory reporting and how supervisors may use the output from the ORSA will be covered by other Issues Papers which CEIOPS plans to publish".*

  CEIOPS also felt that: *"there is a perception that undertakings may view the ORSA as requirements for a process with a degree of complexity and sophistication far in excess of what the European Commission and CEIOPS actually envisage. All this has created a certain amount of uncertainty for the market as to what to expect from this new requirement".*

  Finally, "With no Level 2 advice to prepare, CEIOPS would normally only develop such guidance at a later stage. However, for the sake of transparency, CEIOPS has decided to advance its discussion of ORSA issues and publish its views early on in order to clarify for the market what the ORSA is meant to achieve".

- Groupe Consultatif Response to CEIOPS Paper (August 2008)

  www.gcactuaries.org/documents/GC_response_ORSA_issues_final_270808.pdf

  In this short paper the Groupe Consultatif responds to the CEIOPS issues paper.

- Groupe Consultatif Input to Level 3 Guidance

  Expected in early 2011

- The Solvency II Actuary : Morgan/Olesen Paper

  www.actuaries.org/ASTIN/Colloquia/Manchester/Papers/morgan_olesen_paper_final.pdf

  This paper discusses the role of the actuarial profession in a Solvency II world, and includes a short section on the ORSA.

- GIRO Working Party: The actuary's role in the ORSA - on-going (established 2009)

  This working party provided an interim update to the "Closer look at Solvency II" seminar in April 2010.

  http://www.actuaries.org.uk/sites/all/files/documents/pdf/gosrani.pdf

  The output of the working party will be available on the UK Actuarial professions website in due course.

- EU Commission Solvency II Frequently Asked Questions (2007)

  http://europa.eu/rapid/pressReleasesAction.do?reference=MEMO/07/286&format=HTML&aged=0&language=EN&guiLanguage=en

  FAQ 27: What is the 'Own Risk and Solvency Assessment'?

As part of their risk management system, all (re)insurance undertakings must have a regular practice of assessing their overall solvency needs with a view to their specific risk profile, known as 'Own Risk and Solvency Assessment' (ORSA). The main aim of the ORSA is to identify whether the particular risk profile of an undertaking deviates from the assumptions underlying the regulatory capital calculation (e.g. European Standard Formula).

The ORSA has a twofold nature. It is an internal assessment process within the undertaking and is as such embedded in the strategic decisions of the undertaking. It is also a supervisory tool for the supervisory authorities, which must be informed about the results of the undertaking's ORSA.

The ORSA does not require an undertaking to develop or apply a full or partial internal model. However, if the undertaking already uses an approved full or partial internal model for the calculation of the SCR, the results of the model should be used for the ORSA.

The ORSA does not create a third solvency capital requirement. A deviation between the ORSA and the SCR calculation does not lead to an automatic increase of capital. The supervisory authorities have a range of supervisory tools if they deem it necessary to react. A capital increase is just one possibility (see question 28).

The ORSA is very specific to the undertaking's risk profile. It should therefore not be too burdensome for small or less complex undertakings.

- IAIS Guidance Paper On Enterprise Risk Management For Capital Adequacy And Solvency Purposes (October 2008)

  http://www.iaisweb.org/__temp/14__Guidance_paper_No__2_2_5_on_ERM_for_capital_adequacy_and_solvency_purposes.pdf

  The EU commission acknowledges the IAIS as the source of much of its thinking on Solvency II[3]. Section 3 of this paper gives a useful summary of the IAIS's ORSA principles.

- CEIOPS Level 2 Advice: Supervision of Group Solvency for Groups with Centralised Risk Management (former CP66)

  https://www.ceiops.eu/fileadmin/tx_dam/files/consultations/consultationpapers/CP66/CEIOPS-L2-Advice-Group-solvency-for-groups-with-centralised-risk-management.pdf

[3] See final sentence of http://europa.eu/rapid/pressReleasesAction.do?reference=IP/07/1060&format=HTML&aged=0&language=EN&guiLanguage=en

Appendix II: Similar Regimes Internationally

II.1 Ireland

Actuarial Financial Condition Report

In accordance with legislation, every life assurance company must appoint an actuary ("the Appointed Actuary") who is required to conduct an annual investigation into its financial condition and to report to the Board and to the Financial Regulator. The Appointed Actuary must certify the company's technical reserves and state of solvency and confirm that new business premiums are sufficient, in the context of the company's capital resources, to enable it to meet its commitments and to establish adequate technical reserves.

While the preparation of the annual valuation report is the Appointed Actuary's primary statutory duty, the Society of Actuaries in Ireland requires that he or she also carries out the much wider role of monitoring the financial position of the company on a continuing basis so as to be satisfied at all times as to its solvency.

The Appointed Actuary is responsible for determining the technical reserves and assessing the company's solvency and so must have access to the necessary management information on the company's experience, the nature of its commitments, present and forecast levels of expenses, and investment policy. They also need to be closely consulted on premium rates and policy conditions. While final decisions in these areas rest with the Board, the Appointed Actuary must certify, as part of the annual valuation report, whether or not premiums charged for new business are sufficient. It is, in any event, the Appointed Actuary's responsibility to establish the reserves required having regard to premium rates and policy conditions.

A further duty of the Appointed Actuary is to prepare, on specified occasions, an Actuarial Financial Condition Report for submission to the Board and to the Financial Regulator. The Actuarial Financial Condition Report includes projections of the Company's financial position, with the important assumptions being varied to establish the sensitivity of the Company's financial condition to changes in those assumptions.

The purpose of preparing an Actuarial Financial Condition Report is to identify plausible threats to satisfactory financial condition, actions that lessen the likelihood of those threats, and actions that would mitigate a threat if it materialised. As such, an Actuarial Financial Condition Report serves a critical governance function by enabling the Board and management of the Company to focus on its future risk profile and on the risk management options available.

ASP LA-2 sets out the detailed guidance in respect of the Actuarial Financial Condition report, which although wide ranging, are not as all encompassing as the risk and governance requirements that should be considered under the ORSA.

II.2 Bermuda

The BMA has issued a series of discussion paper in September 2009 as a prelude to a set of consultation papers issued in the 3rd quarter of 2010.

Central to the consultation papers are the concept that a CISSA (Commercial Insurer's Solvency Self Assessment) is the prime tool that the regulating authority will use to validate that the company is holding sufficient risk capital and will be central to any discussions and site visits with the company. The BMA is looking at requiring a first CISSA submission in the 2nd quarter of 2012.

The discussion paper sets out that the key principles of the CISSA are that it:

1. Is performed, reviewed and approved by the board/senior management.

2. Encompasses all material risks and the relationship between risk and the quantity and quality of capital.
3. Includes the determination of financial resources given the risk tolerance and business plan.
4. Is forward looking, taking into account the business plans and projections.
5. Is documented.
6. Passes a use test i.e. it is integrated into the management process and decision making.

http://www.bma.bm/uploaded/507-100709_Consultation_Paper_on_Commercial_Insurer_s_Solvency_Self-Assessment_(REVISED).pdf

II.3 Malta

The Malta FSA issued a paper in April 2010 on The System of Governance under Solvency II which has a section on the ORSA. Generally the paper just emphasises many of the points raised in the CEIOPS Issues Paper.

One interesting statement is that the undertaking should ensure that the ORSA can be easily reviewed by the authority and, as such, documentation should be compiled in a way that can be easily shared with the authority.

http://mfsa.com.mt/files/insurance/insurers/solvency/files/The%20System%20of%20Governance%20under%20Solvency%20II.pdf

II.4 Guernsey

The Guernsey FSC requires companies to carry out their own Own Solvency Capital Assessment (OSCA). There is not a prescriptive format but a list of some 22 items that are expected to be addressed.

The level of detail required in the OSCA is intended to be appropriate to the size, nature and complexity of the company.

http://www.gfsc.gg/UserFiles/File/Insurance/Guidance%20Note%20on%20Solvency%20Assessment%20July%202008.pdf

II.5 Gibraltar

The Gibraltar FSC has not issued any specific ORSA requirements but deferred to the UK FSA for their guidance.

http://www.fsc.gi/download/adobe/insurance/insurance022009.pdf

II.6 USA, NAIC

The NAIC issued a consultation paper on a solvency modernisation initiative which will look at worldwide solvency developments.

It sees the concept of an ORSA, covering many of the features of our Solvency II ORSA, as being a requirement for each company to perform.

www.naic.org/documents/committees_ex_isftf_1003_cg_rm.doc

II.7 Canada

In January 2010 the P&C MCT Advisory Committee published a paper looking at the key principles for the future direction of P&C capital requirements. Although the paper does not actually mention an ORSA, the internal modelling requirement and other aspects of the paper indicate such an approach.

http://www.osfi-bsif.gc.ca/app/DocRepository/1/eng/guidelines/capital/guidelines/CRCF_PCI_e.pdf

II.8 Australia

One of the principle features of the Australian prudential regulatory standards is the use of internal models by companies to assess their capital requirements. There is a standard prescribed method but companies are expected to consider other relevant risks above those set out in the prescribed method.

There does not appear to be an ORSA requirement but a large number of the various risk governance elements of Solvency II are included in the prudential requirements.

http://www.apra.gov.au/General/General-Insurance-Prudential-Standards-and-Guidance-Notes.cfm

II.9 South Africa

The South African Financial Services Board (FSB) is introducing a revised prudential regulatory regime for insurers based on Solvency II, to ensure the regulation of the South Africa insurance sector remains in line with international best practice. The new solvency regime both for short and long term insurers will be known as Solvency Assessment and Management (SAM) and will be implemented in January 2014.

The primary purpose of the new regime is to improve the protection of policy holders and beneficiaries. It will be based on the Solvency II regime and will share the same broad features. Additional objectives of the regime are:

- To align the capital requirements of insurers with their underlying risks.
- To develop a proportionate risk based approach to the supervision of insurers.
- To provide incentives to insurers to adopt more sophisticated risk monitoring and risk management tools.
- To maintain financial stability.

ftp://ftp.fsb.co.za/public/media/SAMROADMAP03112010.pdf