# Journey of Insurer Solvency regulations – 2007 and beyond

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## Abstract:

The growing need of a risk-based approach to manage the enterprise as well as assess the capital requirements has led to an important development in the EU. Solvency 2 directives in the EU encompass a wider range of aspects of insurance company operations. The member countries are at various levels in terms of recognizing the specific risk profiles of the insurance companies. Given the various levels of maturity and sophistication at which the member countries are operating, implementing the directive is not an easy task.

## Key Words:

Solvency Margin, Mathematical reserve, Guarantee fund, Capital at risk, Minimum Capital requirement, Solvency Capital requirement, Cost of capital, Technical Risk, Investment Risk, Best estimates, Risk Margin

## Introduction

Insurance has always been one of the most regulated industries mainly on account of "risky" nature of its business. Over a period of time, there has been a progressive movement towards a more deregulated environment. The regulators, however, still hold the responsibility of protecting the policyholders' interests.

Solvency has been a primary measure to gauge the health of an insurance company. Solvency as a metric for measuring the ability of the insurer to uphold its contractual obligations has remained, though the method used for its calculation has undergone substantial changes. Hence, solvency norms form the most important part of the supervisory compliance in insurance.

Regardless of the supervisory regime, all "solvency norms" approaches have a few common features[1].

[1] "On Solvency, Solvency Assessments and Actuarial Issues" IAIS Sub–Committee on Solvency and Actuarial Issues Final Version – 15 March 2000

- All of them consist of a “minimum solvency requirement” (a minimum amount of surplus of assets over the liabilities) or “required minimum margin"
- The insurance companies need to prove that the “available solvency margin” (amount of free capital required for regulatory purpose) exceeds the “minimum solvency requirement”
- The “control” level represents the amount that requires the regulator’s intervention
- The “solvency test” shows compliance with the solvency requirements as laid down by the regulator.

The European Union is introducing a new, risk-sensitive approach for measuring the financial stability of insurance companies. Known as Solvency II, this approach is intended to provide greater security for policyholders and stability for financial markets by providing insurance supervisors with better information and tools to assess the financial strength and the overall solvency of insurance companies.

Solvency regulations have evolved over time from simple ratio-based methods to complex risk-based approach. The paper traces the journey of the solvency regulations starting from the first life and non-life directives of the EU (in the 70’s) through the era of Solvency I till its evolution into a better risk-based approach.

Owing to the overwhelming complexity of the subject, discussing the path of regulatory evolution from the perspectives of all lines of insurance business in a single article is an impossible task. Hence, we have kept life portfolio as the basis for discussions in most parts of the paper. In addition, our discussions in this paper center on the various approaches to liability valuation (there are other aspects like models, risk measures, asset valuation etc. that could also be topics of discussion to highlight the differences between various solvency regimes)

## Early days of solvency regulations

Though there were different methods used to work out solvency margin of insurers over the years, The Life insurance directives (EEC 1979) and the non-life insurance directives (EEC 1973) can be considered the starting point of a formal set of solvency requirements that insurance companies were required to fulfill in a free market. The approach adopted those days were simple and straight forward to operate. Solvency assessment was based on simple factors and formulae that were applied on accounting results after adjustment for reinsurance - for example, in case of life insurance, simple factors were used on the mathematical reserve or the capital at risk depending upon who bore the investment risk.

The early day solvency regulations were significant as the starting point of the journey. The calculation of the Minimum Solvency Margin (often

referred to as the Required Solvency Margin) consisted of a sum of two results:

- The first related to the mathematical provisions (represented by Investment Risk)
- The second related to policies where the policyholder bears the investment risk (represented by Technical Risk)

In addition, there was a Guarantee fund that was an amount in absolute terms.

One third of the Minimum Solvency Margin was compared with the guarantee fund to arrive at the minimum guarantee fund. In essence, the calculation involved:

**A: Minimum Solvency Margin (**or Required Solvency Margin**)** =

4% mathematical reserves (gross of reinsurance)
+
0.3% capital sum at risk

**B: Guarantee fund = 800,000 ECU in 1979**

**C: Minimum Guarantee Fund = max (1/3 A, B)**

The base formula for Minimum Solvency Margin was applicable for life insurance and annuity business. The 4% was based on the assumption that the loss ratio (= losses/technical provisions) follows a Pearson Type IV distribution and 4% corresponds to 95% Confidence Interval.
There were some variations to this for other classes of business like supplementary insurance, short term temporary assurance and permanent health insurance. There were some restrictions on Zillmer adjustments made to the capital sum at risk.

Insurers were required to meet the Required Solvency margin (RSM) norms as on the date of the latest balance sheet. RSM should typically be more than the Minimum Guaranteed Fund. Any fall in capital below the RSM level would trigger a 'warning signal'. If the capital falls to the level of the Minimum Guaranteed Fund, 'wind up' would be triggered. So, the "wind up" was based on fixed ratios.

Though the factors were simple to apply, easy to administer and understand, they were simple formula based and did not consider risks explicitly. However, they lacked the capability to cope with the increase in market complexity and rising customer protection needs.
The assets could be valued at historical/amortized costs as well as market value. Hence, asset valuation was not completely harmonized. In life insurance, since simple factors were being applied, a strengthening of the reserving basis led to an increase in mathematical reserve and hence a direct increase in the required solvency margin. So, in effect prudence did not really work towards the advantage of the insurance company in terms of availability of free capital.

The drawbacks of this solvency regime were examined in detail in the Müller report [2] published in 1997.

## Solvency I

### Moving ahead from the early days

The findings of Müller report and the work done by a few other committees which looked into solvency regulations, paved the way for one of the major landmarks in the journey – introduction of Solvency I in the EU in the year 2002. It introduced some additional parameters in solvency evaluation – to cite an example, for non-life insurance an additional index over and above the premium and claim index was introduced to take care of the long-tailed claims.
Changes to the Life Directives were, however, quite minimal. In life insurance, the directive stated that the available solvency margin to cover the technical provisions must be of good quality. It further specified the solvency margin for unit-linked contracts.

Solvency I provided a simple, but robust mechanism to regulate insurer solvency. It has improvements over the early day regulations, but still maintained its simplicity. A positive consequence of this was that it made the administration and compliance management easy and inexpensive.

In spite of its relative simplicity, Solvency I did significantly increase the protection of the policyholders. That explains the reason why the system performed well over the years.

### Transition from Solvency 0 to Solvency I

Though Müller report found the existing structure of solvency margin satisfactory, some suggestions were made for further improvement. The key suggestions were:

- The minimum guarantee fund should be reviewed and updated at regular 5 year intervals
  - In Solvency I, Minimum requirement was increased to 3 million euro - to be updated in the future in line with EU consumer price inflation
- The regulations should not only look at the solvency margin, but also at the composition of the margin and the guarantee fund.
- The risks identified to be classified as:
  - Technical (insufficient premiums, mortality, morbidity, interest rate – that would perhaps affect discontinuance rates, reinsurance etc.)
  - Investment (depreciation, liquidity, matching, interest rate including reinvestment, derivatives etc.)

[2] Müller report (1997): "Solvency of Insurance undertakings"
http://www.ceiops.org/media/files/publications/reports/report_dt_9704.pdf

- Nontechnical (management, 3rd party credit risk, regulations etc.)

The introduction of Solvency I norms helped provide higher protection to policyholders. A few of the significant differences which came up were:

- Unlike the 'point in time' approach in the previous regime, Solvency I stipulated that solvency requirements should be met at all times and not just on the date of the latest balance sheet.
- Permanent health insurance required additional capital over and above what was specified in the earlier regime
- Insurance companies were required to have an *additional* solvency margin for unit-linked contracts (firm bears no investment risk) where the allocation to management expenses was not fixed beyond 5 years.

  Another significant difference was that the member states were free to set more stringent requirements than those specified in the Directive, if they so desired.

**Need for further evolution**

However, since the creation of these rules, significant changes (cited below) had taken place in the insurance industry, creating the need to adapt the rules[3] appropriately.

- The equity markets were strong in the later nineties helping insurance companies. This changed in early part of this decade – 2001 – 02
- Fall in interest rates making it difficult to meet the Guaranteed returns
- Increase in Life expectancy
- Increase in the frequency of high impact events more often than ever

The working document for Solvency I had already indicated the need for a better system which recognizes the various risks that an insurance company is exposed to in a more holistic manner. In some sense, Solvency I had already paved the way for the development of a more sophisticated and holistic approach as entailed in Solvency II. Another factor which prompted reforming of the solvency regulation was the fact that some other countries like the US had already started the move towards a risk based capital system.

3 Risk-Based Solvency Requirements, Hansjörg Furrer, Swiss Life, Conference in "Recent Developments in Financial and Insurance Mathematics and the Interplay with the Industry" Oberwolfach, 18-24 February 2007

In 1999, at a meeting of the Insurance Committee (IC) it was agreed that a more fundamental review of the overall financial position of an insurance company should be done. This review was to include previously neglected risk classes (e.g. ALM risk, Operations Risk etc) – Solvency II committee came into existence as a result of this decision.

## Solvency II

### Moving ahead from the early days

European market has initiated steps to adopt a principles based approach for insurer solvency. Solvency II is a new, risk-sensitive system for measuring the financial stability of insurance companies in the EU. It is intended to provide greater security for policyholders and stability for financial markets by providing insurance supervisors with better information and tools to assess the financial strength and the overall solvency of insurance companies[4].

Even before it is fully implemented, Solvency 2 is expected to usher in large scale changes in product portfolio, operations as well as the reporting requirements of insurance companies.

[4] Risk Based Capital Management – a risk based approach to insurer solvency management : Preeti ChandraShekhar & S R Warrier, APRIA 2007

**What has changed?**

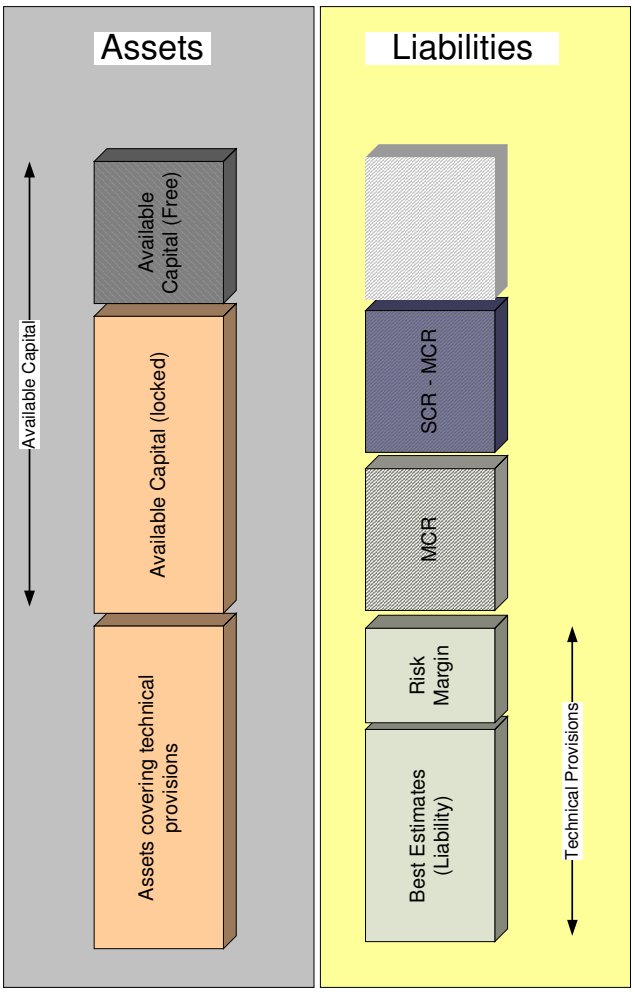
The fundamental shift which happened in the adoption of Solvency II is the change in the approach to one which is principle based, built on top of a risk based capital framework. Regulations are being redrafted from a rules-based set to a risk-based one.

A traditional approach to capital adequacy and solvency assessment that involves calculating the capital requirement based on static accounting results is limited in scope. It does not go beyond the balance sheet. This leads us to consider a solvency assessment based on risk. A "Risk based solvency assessment" involves considering the risks that the company is exposed to and factoring these risks while addressing the capital needs. The principles on capital adequacy and solvency of insurers as laid down by IAIS[5] talks of 14 principles. One of the principles (#6) suggests that "Capital adequacy and solvency regimes have to be sensitive to risk". This means that while the valuation of assets and liabilities depends on the regulations in the geography of operations, the solvency margin should also consider risks that have not been adequately reflected in this valuation i.e. "off-balance sheet items"[4].

If we were to drill one level below, several differences could be observed between Solvency II and Solvency I

- The Required Solvency Margin has been replaced by the Minimum Capital Requirement (MCR)
- MCR is required to be calculated at least once a quarter and reported to the supervisory authorities
- Minimum MCR has been stipulated as 2 million Euros (the guarantee fund has been replaced by MCR)
- The MCR acts as the safety net – it is the level below which the supervisory intervention triggers off
- An additional capital requirement called Solvency capital requirement (SCR) is the target level of capital (called the "target capital" under the Swiss and Dutch regimes). This is the starting point of calculation of the adequacy of the quantitative requirements6.
- SCR can be calculated using standard formula or internal model
- MCR and SCR are calculated separately. MCR uses the technical provisions – risk margin i.e. BEL or capital at risk. The factors are applied to the BEL or capital sum at risk on the same lines as Solvency 0 and Solvency I with a minimum floor (similar to the guaranteed amount under earlier regimes)

[5] Principles on capital adequacy and solvency (2002), www.iaisweb.org (downloaded on 28th May 2007)
[6] Solvency 2 directive 2007




**Why is Solvency II risk-sensitive?**

The new Solvency II norms provide for a risk-sensitive calculation of the capital requirement in the form of the Solvency Capital Requirement (SCR). Companies are not expected just to comply with additional limits on capital requirements. As elucidated below, the SCR is used to arrive at capital charges based on specific risks rather than limits based on rigid rules.

**What is "principles based" in Solvency II?**

Solvency norms are classified into two broad categories:

1. Rules based that apply well defined factors to Accounting basis. The factors are clearly defined and the rules on what information the factors need to be applied are clearly defined.
2. Principles Based where the approach to valuation of liabilities is specified by general solvency principles and does not have rigid

rules. The more detailed methodology is, however, left to the discretion of the insurer as long as it is consistent with the principles set out.

Solvency II norms are “principles based”. Recognizing the need to set up a regulatory approach that is more flexible and adaptive to the dynamic market conditions, the Solvency II directive follows the Lamfalussy procedure (used for the regulation and supervision of the EU securities market). This procedure follows a four-level approach:

Level 1: Commission adopts a directive or regulation that contains the framework principles (no rigid rules are specified)
Level 2: The measure is adopted based on advice from various professional bodies
Level 3:Interpretation of the directive, Guidelines, recommendations and common standards evolve. The detailed methodology is set out. Consistent implementation and application of the directive are ensured.
Level 4: Compliance by member states is checked and ensured by the commission.

This procedure ensures that the new solvency regime is able to keep pace with the future global market and technology developments in the insurance industry as well as synchronization with new emerging accounting standards.

However, “principles based” does not mean no rules. The implementation of the principles would require rules that are build using these principles.

**Technical provisions and risk margins under Solvency II**

The solvency norms have always stated that Technical provisions should be “adequate in respect of the entire business of the company. The Technical provisions should be set in a prudent manner, prospectively with prudent assumptions for interest rate, demographic factors and allowances for costs.” Industry practice in most countries is that the Technical provisions have typically included margins for prudence.

However, when there is no separation between best estimates and risk margin, the information is not transparent enough either for the regulator or for management decisions to understand the underlying assumptions.

Solvency II norms require the insurance company to report the best estimates and the risk margins separately. This is a major distinction between the earlier solvency norms and Solvency II. Under Solvency II, the margin over and above is not just a “prudent actuarial margin”. It is a margin that is determined using the principle of “return that the investor would expect for bearing the uncertainty or risk associated with the cash flows.”

**Calculation of SCR and Risk Margin under Solvency II**

Under Solvency II, there are two levels of capital requirements that are distinct and calculated separately. While the SCR is calculated using best estimate value of liabilities, the calculation of risk margin using Cost of Capital approach (recommended by the directive) takes the SCR for future years as an input. In that sense, CEIOPS ("Committee of European Insurance and Occupational Pensions Supervisors", a key stakeholder in the drafting process of Solvency II). has very clearly avoided the problem of "circularity". Some significant features are:

- Best estimate is gross of reinsurance
- Best estimate of the liability is arrived at using the cash flow approach; if any options or guarantees exist and can be hedged by suitable financial instruments (derivatives), then the cash flow will be separated as hedgeable and non-hedgeable (wherever possible).
- Risk margin is calculated using CoC and net of reinsurance
- The risk margin shall be calculated only for the non-hedgeable.(In practice, most of the life insurance risks are non-hedgeable.)
- CoC calculation includes underwriting risk, operational risk for existing business and counter party default for ceded reinsurance. It excludes market risk
    - CoC factor = risk free interest rate + 6%
- $\mathrm{SCR} = \mathrm{BSCR} + \mathrm{SCR}_{ops}$
- $\mathrm{BSCR} = \mathrm{SCR}_{non-life} + SCR_{life} + SCR_{heath} + SCR_{market} + SCR_{default}$
- $\mathrm{CoC} = \sum_{\mathrm{i}} (\mathrm{BSCR}^{\mathrm{i}} - SCR^{i}_{market}) * CoCfactor$ for all i>1 upto projection term used

**Calculation of MCR under Solvency II**

Under Solvency II norms, in order to maintain the continuity with the existing solvency arrangements, the approach towards MCR is based on a combination of the technical provisions (excluding the risk margin) and sums at risk. Some factors are increased to reflect the fact that the existing solvency norms use technical provisions with margins whereas under Solvency II, MCR calculation is done on best estimates excluding the risk margin.

Under Solvency II,

$$\mathrm{MCR} = \mathrm{MCR}_{\text{non-life}} + MCR^{*}_{non-life} + MCR_{life} + MCR^{*}_{life}$$

Where

$MCR_{non-life}$ = the MCR for non-life business (not applying the absolute floor)

$MCR_{life}$ = the MCR for life business (not applying the absolute floor)

$MCR^{*}_{non-life}$ = the MCR for non-life business similar to life business (not applying the absolute floor)

$MCR^{*}_{life}$ = the MCR for supplementary non-life business underwritten in addition to life insurance (not applying the absolute floor)

For life business, $MCR_{life}$ is given by

$MCR_{life} = \sum_{i} \alpha_i * TP_i + \sum_{j} \beta_j * CAR_j$ where $\alpha_i \, and \, \beta_j$ are coefficients (similar to 4% of mathematical reserve and 0.3% of Capital at risk applicable under pre-Solvency I and Solvency I though more granular depending upon the nature of risk associated with the particular portfolios)

The $MCR^{*}_{life}$ is calculated on the same lines as $MCR_{non-life}$ where

$$MCR^{*}_{life} = \sum_{lob} \max(\alpha_{lob} * TP_{lob}; \beta_{lob} * P_{lob})$$

$TP_{lob}$ = technical provisions (not including the risk margin) for each line of business, net of reinsurance, subject to a minimum of zero

$P_{lob}$ = written premiums in each line of business at the reporting date, net of reinsurance, subject to a minimum of zero

$\alpha_{lob} \, and \, \beta_{lob}$ are defined by the directive for each line of business.

## Where are the EU countries now vis-à-vis Solvency II?

Most countries in the EU recognized the need to enhance their solvency assessment frameworks. The following sections briefly discuss the existing frameworks in three countries – UK, Switzerland and Netherlands and their challenges in moving towards Solvency II.

**FSA and Solvency II**

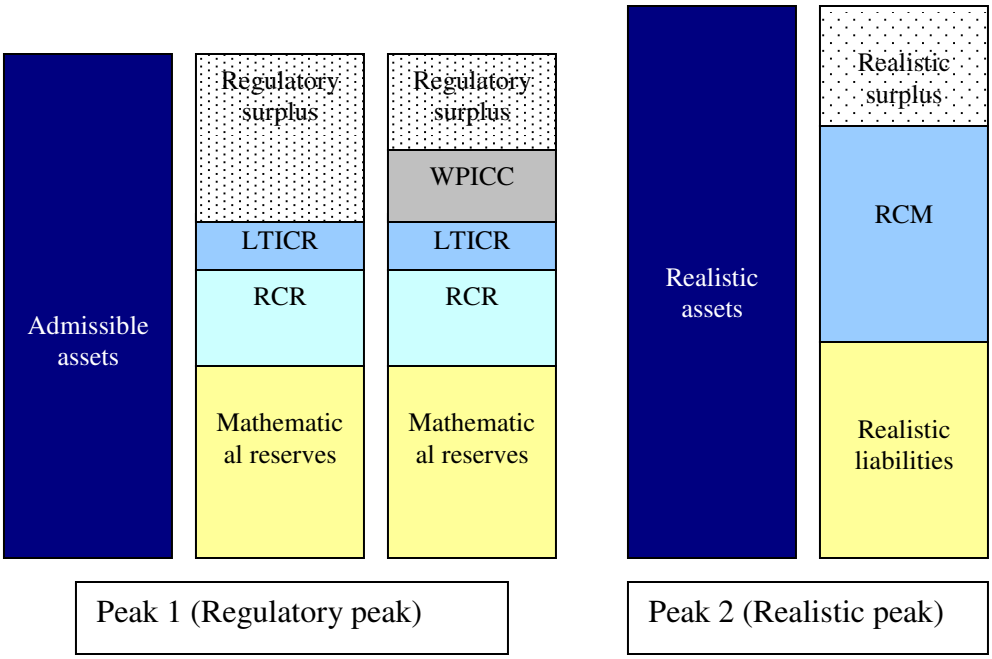
The capital requirements as they existed under Solvency I were considered to be non-risk sensitive and inadequate by the British Financial Services Authority (FSA). However, they also knew that a detailed study that was a pre-requisite for the proposed risk-based system under Solvency II was not likely to happen in the near future. The FSA adopted an alternative approach whereby the firms were expected to hold a level of capital (over and above the MCR) that reflects the nature and volume of the insurance company's business.
The FSA adopted a twin-peak approach. For life insurance companies, this aimed at establishing the missing link between provisioning for liabilities and capital requirements for "with profits" business AND potential discretionary future bonuses. It helped in determining whether the company needed to hold additional "top up" capital over and above the Mathematical reserves to cover the potential discretionary future bonuses.
This means that companies having a "with profits" portfolio are required to hold an additional capital for with-profits termed as WPICC.
Summarizing, the solvency requirements for a life insurance company are:

- CRR (Capital Resource requirement) = max (MCR, ECR) where
- MCR (Min Capital Requirement) = max (BCRR, LTICR + RCR) where

  BCRR is the Base Capital Resource Requirement (similar to the minimum guarantee fund)
  LTICR is the Long term Insurance Capital requirement
  RCR is the Resilience Capital requirement that represents the capital required to cover the market risk under the shocks (fall in equity values, property values etc.)
- ECR or Enhanced Capital requirement = LTICR + RCR + WPICC (where WPICC = 0 for companies that do not follow twin-peak)

Various components can be represented as[7]:

[7] SA2 – PC – 07, ActEd Study Material, 2077 examinations, Institute of Actuaries




All companies are required to calculate "Peak 1", regardless of the basis of capital assessment (realistic or regulatory). A company that has been classified as "realistic-basis life firm" have to have an additional "Peak 2" valuation. The RCR (Risk Capital Margin) under Peak 2 is required to cover the impact of stress tests that companies are required to conduct.

The introduction of ECR (enhanced capital requirement) is based on simulations and concepts of DFA (Dynamic Financial Analysis). This marks a clear shift in responsibility from the regulator to the insurance firms. The firms are now required to assess both the quantity and quality of capital appropriate for their business. It also gives the insurance companies an opportunity to use their own internal models.

The Mathematical reserves and well as the Realistic liabilities are expected to be based on prudent assessment of contractual and guaranteed benefits. The realistic valuation explicitly addresses the expected discretionary bonus payments.

The risk margins contained in the Technical provisions are not required to be calculated or reported separately.

The risks used in calculating the capital under Pillar I do not include Operational risk. However, the guidelines do contain details on how the insurance company should manage its systems, controls and policies for Operational risk (under Pillar II).

**SST and Solvency II**

The Swiss Solvency test (SST)[8] was introduced in 2003. It involves the calculation of a Minimum capital and a Target capital. The minimum solvency capital is calculated based on the statutory balance sheet and does not depend upon the company's specific exposures.
There are standard models for calculating the market, credit and insurance risks. The risks and events that are not covered by the standard models can be modeled using adverse scenarios which need to be aggregated with the standard models.

The SST values all assets and liabilities market consistently[9]. Consistency is the hallmark of SST. Under SST it implies consistency[10]

- between asset and liability valuation
- between valuation and quantification of risks
- between solvency tests and SCR at group vs. entity level
- between insurers and reinsurers
- between life and non-life

For market consistent valuation of liabilities represented by technical provisions, market consistent value equals the best estimate plus the MVM (market value margin).
The MVM is calculated using Cost of Capital (CoC) approach for regulatory reporting. CoC is the recommended proxy for MVM (percentile approach is another approach that is known in the industry). The MVM is such that it is the cost of future capital required to run off the existing liabilities i.e. the amount by which a second insurer would need to be compensated for the risk if he takes over the assets and liabilities.
The CoC approach for standard models as elucidated in the Solvency II directives and Technical Specifications use the same methodology as described under SST (i.e. project the SCR for future years and use the CoC factor on these SCRs to arrive at the MVM).

SST also considers Operational risk under Pillar II on the same lines as FSA.

Companies are allowed to choose between standard models and internal models. The internal models need to be tested under pre-defined scenarios.
While large insurance companies were to comply with SST as of 2006, insurance groups, reinsurers and small companies need to comply till

[8] "Summary on the Swiss Solvency Test" by ROGER KAUFMANN , ANDREA SWYLER http://www.ag-ai.nl/files_content/ag%20publicaties/actuaris/da%2012-4/summary%20swiss%20solvency.pdf

[9] "The Swiss Experience with Market Consistent Technical Provisions - the Cost of Capital Approach", Federal Office of Private Insurance, March 28, 2006

[10] "Internal Risk and Capital Modelling for Insurers and Reinsurers", Philipp Keller, Federal Office of Private Insurance London, 24 May 2006

2008. On the other hand, operational details under Solvency II are still evolving. So one needs to "wait and watch" to see how the Solvency II aspects map to the SST directives.
It would be more challenging for supervision of groups and group level SCR. Considering that under Solvency II, the internal models require single approval for Groups (consolidated business), consistency of approach across jurisdictions would be the biggest challenge. Model verification by the supervisors would be the most daunting task. In addition, for companies that adopt internal models, the model has to be an inherent part of the company's management and internal processes. This is to say that the models used for regulatory purposes and management needs should be aligned.

**Netherlands and Solvency II**

The Dutch system proposes to introduce a supervisory regime that aims at aligning the supervisory regime with the statutory accounts i.e. there should be only one set of accounts for accounting and solvency purposes. The new financial assessment framework (FAF) consists of the following key elements:

- Assets and liabilities values to be realistic
- The solvency test has to be performed each year
- Each company has to take into account its strategies, objectives etc. on a going-concern basis

The realistic values of insurance liabilities consist of a best estimate *plus* a risk surcharge. The risk surcharge can be calculated using an internal model and has to be stochastic. The margins are to be calculated separately for separate risk groups.

The Dutch system does not currently do any quantification of Operational Risk though there is an intention to include it in future.[11]

## Solvency II – Beyond 2007

Though the timeline for compliance looks a distant 2012, insurance organizations need to sit up and chalk out their plans as they could encounter a few challenges during implementation. The boundaries have been drawn with the draft directive

**Challenges associated with Models.**

11 "Solvency Assessment Models Compared" Produced by CEA and Mercer Oliver Wyman in cooperation with all European insurance markets, 2005

QIS2 responses from many Insurers took more time than estimated. It clearly indicates that the companies are yet to come to terms with issues related to SCR calculation, Data issues etc.
Insurers can opt for either a standard model, internal model or partial model (a combination of both internal and standard model) for SCR calculation. Companies going the internal model way need to get approval from the regulators. The development and approval process could potentially be laborious.

Companies will perform future looking sensitivity analysis and stress tests to do both qualitative and quantitative assessment of various risks. This calls for strong modeling capability from the Insurers.

Small insurers and niche players, with their limited modeling capabilities, may face higher capital requirement pressure since their portfolios may not reflect the market reality.

Companies need to fill the gap between complex statistical specifications and Information technology to build robust models. The model needs to be internalized and properly understood by the key management decision makers. There could be nothing more dangerous than a complex model that is interpreted differently by different people in the company. It is absolutely essential that there is a common understanding of the underlying assumptions, parameters, methods and limitations of the internal model adopted (between the CEO, CFO, CRO, Appointed Actuary ...). The senior management has to ensure that proper review is done periodically to ensure that the model, its assumptions and parameters continue to be relevant as the economic and commercial environment changes.

The models need to be approved by the supervisors. From the supervisor's perspective, it would be almost impossible to formally verify each and every model. The assessment of models would rely heavily on industry best practices and supervisors' experience.

In addition, the internal models have to be transparent to the public in a manner that is easily understood by a knowledgeable person. The basic methodology and approach should be disclosed to the public.

**Data management**

Solvency II reporting will be periodical and orderly. Insurers may submit the information to the national and EU level supervisors on a regular basis. Apart from supervisory reporting, the same information may be needed for public disclosure. S II reports can be audited. For this purpose, the data would be needed in electronic format. These requirements create three major challenges in data management.

**Data Consistency**: Data consistency will be a major challenge for the insurers irrespective of their size and line of Business. Source

systems, Finance, Compliance and a host of Intermediate systems (For example Actuarial, Investments etc.) usually operate on different platforms and approach vital metrics with different business rules. As a result, Top management is left grappling with different values for the same metric.

**Data Availability:** The regulators tried assessing the preparedness of the Insurers in the past. They asked the companies to calculate SCR as per the standard formula supplied by the supervisors and Market Value of Liabilities. The companies which found it difficult in collecting the necessary data will need to improve their data management capabilities. Areas where the insurers have to concentrate are external data, historical data and new data for some of the new risks.
Data Granularity: National regulators with suggestions from EC may decide to audit the submitted data. Insurers need to be prepared to provide contract level data which may roll up to the aggregated metric reported to the regulators.

**The IFRS perspective**

The challenge is to reconcile between IFRS Phase II and Solvency II in the areas of Asset Valuation, Liability Valuation and Disclosure. There are differences under two major categories - Technical provisions and Disclosure

**Technical provisions**: Though there are agreements between Market consistent approach towards provisions, best estimate of liability and use of discounted cash flow in valuation basic differences come from the definition of insurance itself, treatment of diversification benefits and guaranteed benefits under insurance contracts.

**Disclosure**: Greater transparency, providing qualitative and quantitative information to the investing community, higher emphasis on risk management and sensitivity testing are some of the areas lot of similarities exist between IFRS Phase II and S II. Major differences come from the reporting level of detail, definition of insurance contracts and reporting materiality versus relevance to the supervisor.

These conceptual differences may have system and data implications as well.

**Risk Management**

CEIOPS in its paper on Risk Management has set its expectations from the insurance companies about managing and reporting various risks. Multiple stakeholders from the insurance industry has raised concerns.

In some organizations, risk managers perform just the basic risk assessment without any empowerment to challenge the decisions.
Apart from Risk management, there are two more control functions within the organizations: Compliance and Internal audit. Lack of Role clarity may create confusion at the operational level.
There are indications that the stricter risk management standards likely to be applied under S II. At every stage of decision making, risk management needs to be embedded. This calls for a cultural shift within the organization.

S II should not adopt a prescriptive approach specifying roles and responsibilities. This may be difficult to follow for small firms. It is better to follow a principles-based approach.

Operational risk was the difficult to comply with during QIS responses from the member companies. But it plays a vital role in the S II regime. EU directive 2006/48/EC includes a standard approach, a basic indicator approach and an advanced measurement approach for operational risk. It touches upon fraud, operations technology, operational risks the insurer is exposed to, marketing and distribution risks, legal risk and staff related issues. Leaving this to the compliance department could prove to be a costly mistake from the organization.

It calls for the use of external market information about events and conditions relevant to decision making. Industry is not aligned to collecting and integrating the external data for reporting purposes.
The documentation may become complex with so many risks to report. There should be an attempt to simplify the reporting procedure.

**Diversification Challenges**

Diversification at various levels of business brings about the benefits of reduced capital. Aggregation of results at the group level (banks and insurance) will bring down the cost of capital. Aggregation at the LOB (insurance) level will help the insurers a substantial reduction in the capital which can be further invested in the business like competitive product pricing. Next level of diversification can take place within and across risk types. E.g. geography concentration and portfolio level aggregation.

Diversification, however, is not without challenges. The following are some of the key challenges:

- Calibration standards need to be transparent. The possibility of a subsidiary getting a lower rating compared to the group level rating would adversely affect the capital requirements within the group if the standards are not transparent.

- Supervisory cooperation is vital for better diversification benefits. Solvency II would need to articulate the relationship between the group lead supervisor, solo supervisors and the

committee of supervisors in detail to ensure a level playing field and supervisory convergence.

- Smaller insurance firms / single line insurance firms may face potential disadvantage from the lack of diversification benefit and have to raise additional capital compared to a similar subsidiary of a larger group.

- Large firms may also have to raise capital, if their risk management framework is not robust, especially for diversified firms, and not able to reflect the real risks.

## Conclusion

The new directive for Solvency II has already been released. It introduces a SCR (Solvency Capital requirement) that is different from the target levels that exist in most countries. The SCR is a requirement that reflects the company's risk profile.
The Directive also sets out a Minimum Capital Requirement (MCR). Falling below the MCR will demand immediate supervisory intervention from the regulators. It should be calculated quarterly using a simple and robust formula on the basis of auditable data.
Given the various levels of maturity and sophistication at which the member countries are operating, implementing the directive would be a challenge. Insurance companies would need to bring together multiple stakeholders within the organization and put together a well thought out action plan to ensure a smooth journey towards compliance. One of the biggest challenges in moving towards a "principles-based" approach is the additional responsibility that all stakeholders within the companies (senior management, board etc.) and regulator (sufficient seniority and ability to engage with the senior management and board) have to ensure adherence to the principles of solvency supervision.

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