THE NEW EUROPEAN PRUDENTIAL SUPERVISORY SYSTEM OF INSURANCE „SOLVENCY II”

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Abstract:
Started in 2001, the "Solvency II" project is intended to be a viable solution to the widely recognized weaknesses of the solvency models from "Solvency I". Based on first works carried out by CEIOPS, has been drafted a proposal for a European directive entitled „Solvancy II" which was communicated to the European Parliament on July 10, 2007. This directive was voted by European Parliament on November 25, 2009. During the year 2010 are going to be made proposals for implementation from the European Commission, and in parallel to harmonize national laws. Entry into force of Directive will take place in 2012. The present paper proposes an overview on the new European prudential supervisory system of insurance.

Key words: *Solvency, Insurance, capital requirement.*

JEL classification: *G22*

1. Introduction

The desire to have a uniform approach on capital adequacy and solvency margin calculation inside of insurance companies, entails respect of common international standards for insurance accounting and the review of prudential supervision system from the regulatory authority. This European context of turmoil in the insurance sector was, for the insurance companies and regulatory agencies, the right opportunity to reform the entire system of prudential supervision in insurance.

Towards this reform, the European Commission, through the regulatory committee of the IAA[1] Insurance, had launched in 2001 the "Solvency II" project whose application is desired to be fully implemented throughout the European community somewhere in the year 2012.

The new solvency assessment system "Solvency II" is for life and non-life insurance companies, and also for reinsurance companies. The system must provide for supervisory authorities, tools and necessary capacity for solvency prospective assessment of insurance companies, must take into account the multiform mutualisation of insurance risks, and also enjoy a sufficient legibility to adequate information of customers and investors.

"Solvency II" project was structured to take place in two stages. The first stage began in 2001 and was completed in April 2003. The second phase is currently ongoing.

The first stage had as objective to determine the general shape of solvency system. For this purpose were built two working groups, one for life insurances and one for non-life insurances. Also have been ordered by European Commission, two general reports, one attached to KPMG[2] consultants office (report named "KPMG Report") and another

[1] *International Actuaries Association;*
[2] Study into the methodologies to assess the overall financial position of an insurance undertaking from the perspective of prudential supervision, may 2002;

attached to a working group formed under the Control Authority of the European Union Member States (report named "SHARMA[3] report).

The second stage of "Solvency II" project, still ongoing, aims a detailed development of solvency assessment methodologies and finding solutions to harmonize European directives, issued upon completion of project stages, within member countries. To develop European directives, the European Commission has the total involvement of CEIOPS[4] committee.

2. "Solvency II" System Architecture

As reported in the KPMG report, the "Solvency II" is structured[5] around a three-pillar, similarly with the system of banking regulation "Basel II".

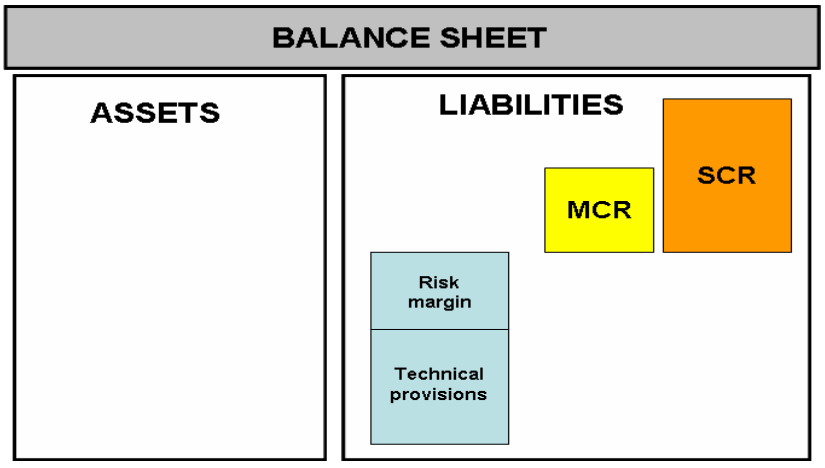
The first pillar includes the quantitative financial requirements[6]. These requirements will include dispositions, at least, towards: provisions, investments made by the insurer and own funds.

The first principle of the insurance companies solvency, set out by the IAIS[7], refer to the technical provisions. These must be *"sufficient, reliable, objective"* and allow comparisons between insurers. One of the weaknesses of the current solvency system is not allowing comparison between insurers.

First pillar also gives a great attention to the rules for determining capital requirements. The role of capital in the prudential supervision system is certainly the most important. Minimum capital requirements should serve to:

- maintain an acceptable probability of ruin;
- formation of an alert threshold more or less early;
- formation of an absolute minimum threshold, beyond which the company will work with a very high declared risk.

Following the simplified balance scheme of an insurance company (Figure 1) can be seen that capital requirements are divided into two levels: first corresponds to the size MCR (Minimum Capital Requirement) and the second represents the size of SCR (Solvency Capital Requirement).



This report was submitted in final form at 24 - 25 June 2002;

[3] The report name was made after the President Working Group;

[4] Committee of European Insurance and Occupational Pension Supervisors. This committee comprises representatives of supervisory authorities from member countries;

[5] European Commission, 2002, Markt/2535/02, pp 29-31;

[6] Linder, U., and V. Ronkainen, 2004, *Scandinavian Actuarial Journal*, 104(6): 466–470;

[7] International Association of Insurance Supervisors - www.iaisweb.org;

Figure 1. Structure of capital requirement

According to IASB[8] technical provisions size is determined as "Best estimate", which is an expected value (hopefully) of provisions. Security margin together with "best estimate" measure for provisions form the concept of *"technical provisions with risk margin"*.

When the capital of an insurance company falls below the minimum capital requirement (MCR), the control authority will intervene in the decision process of the company, acting on different levels depending on the difficulty of the situation. Necessary capital (SCR) is that level of own fund needed by an insurance company to reduce the ruin probability of the company to a level set by regulation, taking into account a given timeframe. Size (SCR) will be calculated using standardized internal models or standard methodologies developed across the EU.

Also in the first pillar are contained conditions for development and application of standardized internal models[9], which should include both risk asset (investments) and liability risk (pricing, reserves, etc.). Regarding the risks, the European Commission designates four major risk categories which must be monitored and controlled as follows: underwriting risks, credit risks, market risks, operational risks. These risks are represented in the following figure.

The second pillar of the "Solvency II" system is based on report Sharma recommendations, which concerns mainly qualitative elements of the new prudential supervisory system. Quantitative risk assessment considered on the first pillar through domestic or standard models should be consistent with appropriate management control processes. Thus the new prudential supervisory system will contain regulations on "good administrative organization and adequate internal control"[10].

Principles relating to the quality of administrative organization and internal control must be accompanied, in turn, by the principles on risk management. In this direction Sharma Report sets four levels of action for risks management according to the type of considered risk, namely:

- company organization and management;
- decision making process;
- monitoring and information;
- investigations and corrective actions.

For a prudential supervisory system to be properly defined, to those introduced above, must be added the principles relating to control of the regulatory authority. These principles include both common monitoring tools and clear and precise rules on the intervention of the regulatory authority in decision-making process of the company, depending on the nature and severity of the detected problem.

The third pillar of the "Solvency II" project focuses[11] on the "market discipline" concept. This concept includes clear and precise rules by which insurance and reinsurance companies will provide information to the control authorities.

[8] International Accounting Standards Board;
[9] European Commission, 2002, Markt/2535/02, pp. 43–55;
[10] European Commission, 2002, Markt/2535/02, p. 47;
[11] KPMG report, 2002, p. 20;

The information provided will be subject to an annual report on the solvency of the company, making public, in fact, both the company's financial situation and risk management system used. Thus, the report will contain particular evaluation methods of assets and technical provisions. The company also will have to describe their own administrative system and give an assessment of the adequacy of this system with the company's risk profile. In addition, for each risk category, the company will describe both the degree of risk exposure and risk reduction measures.

Regarding information provided to the public, supervisory authorities may allow the insurance and reinsurance companies not to publish certain information, whether it would provide a competitive advantage or would be confidential in respect of certain obligations and certain relationships with a counterpart.

3. Capital adequacy under *"Solvency II"*

Starting from Figure 1 – „Structure of capital requirements", we say that the capital adequacy for an insurance company means optimal determine, respecting the rules of the new solvency system, of the following sizes:

- technical provisions with risk margin;
- MCR;
- SCR .

Technical provisions with risk margin will be determined in the first phase using the "Best Estimate" method, which is an expected value which will add the risk margin calculated for a confidence threshold of 75% using the risk measure Value-at-Risk (VaR). In practice the expected value "Best Estimate" can be determined both deterministic and stochastic.

To calculate the MCR size will be used, as a first step, the same approach currently used by the "Solvency I" system[12] and then, as specified by the European Commission[13], will be used a simplified form of calculating the SCR.
To determine the SCR size will be used, or a standard model applicable in a uniform manner throughout the European Union, or an internal model developed at the company level. Both in one case and in other SCR value must not be lower than MCR. In current working hypothesis is retained, to establish the SCR value, a measure of risk in TailVar[14], with a confidence threshold of 99.5%.

For standard models development were taken into account similar approach with Risk-Based Capital (RBC) in service in U.S. and Japan, respectively for internal models was pusued approach based on dynamic modeling of financial flows, similar to the methodology developed by Cummins, Grace, Phillips (1999) and Schmeiser (2004).

Unlike the provisions assessing, SCR determination is a more complex issue. In SCR, the insurer does not have direct observations on the results, so he has no available statistical material for the determination of the VAR.

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[12] Current European system - known as Solvency I - designed to assess the solvency of insurance companies was established by the European Directive in July 1973 and during its operation underwent one major revision in 2002;

[13] „As a working hypothesis, CEIOPS will develop a simple factor-based formula for the MCR simplifying the SCR, possibly by retaining its most significant items, by using a more straightforward technique for aggregation and by calibrating the factors to a lower level of confidence." - „second wave" of Calls for advice in the framework of the Solvency II project, october 2005-;

[14] TailVaR is a coherent risk measure and is calculated as the average losses that exceed a certain threshold;

A standard formula for determining its fund requirements will be proposed[15] by the European Commission. "Solvency II" project also stipulates that in parallel using the standard formula, insurance companies will be able to build its own internal model.
Modeling all the variables affecting the company solvency, the internal model allows simulating the financial situation of the company for a horizon of one year and also will provide the capital requirement which the company needs to not go ruin a year later, with a probability of 99.5%.

The construction of such a model involves determining an extreme quantile of portofolio tail distribution. An estimate of this quantile with 99.5% probability requires a large number of simulations, each taking into account various scenarios such as: insufficient provizisions, adverse developments in financial assets, etc. In fact, to evaluate such quantile will be used "theory of extremes" techniques, which was developed in the early 70's in the Pickands works (1975) and Hill (1975) and more recently on Smith notes (1987), Dekkers and Haan (1989) and also Dekkers and al. (1989). These results were quickly retrieved and applied in finance and insurance (see Embrechts and al. (1997)).

Construction of an internal model will start by describing each item of balance sheet (technical provisions, asset, any interaction between assets and liabilities). When the model parameters will be estimated, will allow, by a simulation technique, to estimate the tail distribution of the results. Once obtaining these tail distribution will be able to calculate VaR size.

Practical implementation of such a model involves taking a set of procedural risks such as:

- model risk - because the model used is only an imperfect representation of reality, its application may lead to underestimation of extreme quantile;
- estimation risk - model parameters are estimated with a certain size error. Consequences caused by these errors can be quite unpleasant for a less robust model;
- simulation risk - generally the results distribution is obtained by simulation, situation where distribution is only an approximation of real situation.

4. Conclusions

"Solvency II" project has as its main objective the prudential reform of insurance field at EU level. Solvency of insurance companies is an important issue recognized by all reports on prudential management. From these reports we can conclusion that insurance companies without solvency problems are those which manages effectively (see Ashby, S., P. Sharma, and W. McDonnell, 2003) the risks they expose. For better risk management is absolutely necessary to measure very accurately these risks. To achieve accurate measurements is necessary to use a coherent risk measures that are applicable to the insurance risks (see Artzner, P. (1999)). If we model stochastic risk, we can connect the concept of ruin probability by the concept of solvency (see Goovaerts and al. (2002)).To better manage the risks they run, insurance companies are encouraged to build internal models which will take into account the company particularities and will lead to a solvency capital allocation lower than provided by standard models. In the same time regulator authorities should be careful, because the usage of such models can lead to underestimation of capital requirements SCR.

[15] In QIS 2, CEIOPS has proposed a model designed to measure each risk and allocating capital requirements appropriately, using as inspiration the American model - Risk Based Capital (RBC).

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