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OWN RISK AND SOLVENCY ASSESMENT REPORT IN LIGHT OF SERBIAN REGULATORY REQUIREMENTS

This paper presents the main objectives of risk management in insurance companies and how to perform a qualitative and quantitative analysis of particular risks in the context of the Own Risk and Solvency Assessment Report (ORSA Report). The Report is a new regulatory requirement which demands of the insurance companies in Serbia to develop procedures for identification and assessment of all risks to which they are exposed to and assess the required capital to cover these risks. Stress test for bonds portfolio is also presented in the paper, as a standard tool to estimate the required capital related to interest rate risk within the ORSA report.

Key words: *Solvency I, Solvency II, risk management, Own Risk and Solvency Assessment Report (ORSA Report), market risk, interest rate risk, frequency severity matrix, available solvency margin, required solvency margin.*

1. Introduction

The risk management system of an insurance company is a comprehensive process, led and supervised by the company's management. It is designed to identify events that may have an adverse effect on the company, with the aim to reduce the exposure of the company to potential losses. The risk management system combines the strategies, policies, processes, responsible persons, technology and knowledge in order to assess and manage the risks to which the company is exposed.

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The risk management system is proportionate to the nature, scale and complexity of the company business activities, as well as the size and organizational structure of the company, scope of activities and lines of insurance business transacted by the company (principle of proportionality).

The company's management understands risk management as a first line (system) of defence in the Company or as a process, to avoid the occurrence of situations that could endanger the company's business. In this respect, capital of the company complements the risk management in terms of ensuring fulfilment of the obligations of the company in the event of exceptionally adverse events.

The main objectives of the company risk management are:

- Identification and management of company risk, inherent in the company business - especially material risks;
- Ensuring stable business in line with the business objectives of the company;
- Operating within defined risk appetite with the intention of achieving set business goals;
- Integration of risk management in the implementation of the business policy of the company in terms of strategic and operational goals;
- Integration of risk management in the organization, according to which each and every employee and manager shall be instructed to control the risks as part of their regular duties;
- Introduction of risk management culture at all levels of the company;
- Assessment of own risk and overall solvency of the company as an integral part of the risk management system and integration into business decision-making system;
- Establishment of transparent reporting of internal and external clients about all material risks to which the company is exposed;
- Establishment of appropriate supervision over the system of company risk management.

As part of their risk management system, all insurance companies should have, as an integral part of their business strategy, a regular practice of assessing their overall solvency needs in relation to their specific risk profile.

Own Risk and Solvency Assessment (ORSA) Report has been described by many as the "heartbeat" of the risk management and solvency process in an insurance company as it connects many different business activities. It has the objective of ensuring that transfer of information about the business itself and its future is well coordinated and persistent.

All risks must be identified and measured (qualitatively and quantitatively) and appropriate level of solvency maintained given the business objectives and risk profile of the company.

The ORSA Report presents one of the newest regulatory challenges. It will require Boards of the insurance companies to be fully involved in developing a top-down risk management process which connects the risk, capital and strategic planning to determine the current and future regulatory and own capital requirements of their companies.

However, ORSA is also an opportunity for companies who recognize that relevant internal processes are set to ensure that business information are consistent and well transferred within the company.

2. International (European) Regulatory Requirements and Definitions for ORSA Report

Own risk and solvency assessment is a continuous, evolutionary and prospective process within the risk management system, where a particular attention is paid to the inclusion of all material risks that may have adverse effect on the fulfilment of company obligations. The process of own risk and solvency assessment takes into account the scope and complexity of the company business, applying the principle of proportionality and paying special attention to the company specific and unique insurance portfolio, organizational structure, the responsible persons and processes engaged in the implementation of business strategy and business plan.

The concept of the ORSA Report was first developed through the introduction of Solvency II regulations in the European Union.

The major European and global insurers which have already incorporated the ORSA Report into their business procedures have found it to be the most value-adding among all new regulatory requirements.

The new added value of ORSA Report is the following:

- Future-oriented risks identification, measurement, control and reporting;
- Assessment of the risk profile and the required capital adequacy;
- Evaluation of future capital needs and requirements;
- A system that monitors regulatory requirements of the solvency position;
- A wider way of understanding the risks related to business continuity and fulfilment of business objectives.

To achieve the necessary analysis consistency level, ORSA Report should be a top-down forward-looking process which connects company risk management, capital management and strategy business planning.

Questions an insurance company needs to answer when developing an adequate risk assessment system are:

- How effective are company risk management activities?
- What are company current regulatory capital requirements and what will be future regulatory capital requirements?
- How much capital do we need to have available given the company business plan and risk appetite, current and future?
- What main risks could jeopardize the company financial position and what mitigating actions are in place?
- What is company future risk profile given the company business plan and what is the company current risk profile?
- What are the potential emerging risks for the company and what is the company doing about those risks?
- What stress tests should the company perform, having in mind its specific risk profile; what is the potential impact of these adverse events on the company and possible steps in these adverse situations?
- How are the strategy, risk management and capital management linked within the company business?

All Companies should ensure that the main objective of the ORSA process is an active and engaging discussion at the Board level at the end of this assessment. The discussion should be based on comprehensive insightful analysis from many areas within the company business. The ORSA Report is expected to be owned by the Board of the company, so these discussions and conclusions should be the ultimate goal of the ORSA process.

There is a variety of ways to carry out an own assessment of your capital needs, starting from simple stress tests for determining an appropriate capital buffer to full stochastic (probabilistic) modelling for the more advanced and larger portfolio companies.

Determination of own-capital needs helps the company to assess the level of capital required for all risks (which are quantifiable) and how to optimize the capital base, whether to retain or transfer the risk, or simply how to deal with those risks.

ORSA requirement for the insurance companies is to analyse its ability to continue its business.

3. Risk Management Process for ORSA Report

A comprehensive risk management process is needed for developing full ORSA Report. Risk management process should include risk identification,

assessment, reporting, measurement and monitoring, to ensure that all risks are fully covered by the assessment.

The ORSA Report should cover all the material risks to which the company is currently exposed and/or could become exposed in the future. Risk categories should include as a minimum underwriting, credit, market, operational, strategic and liquidity risks and additional risks arising.

Stress Tests for ORSA Report

Within the ORSA Report, the companies should carry out their own stress and scenario tests on material risks that are identified in a risk management process. Stress tests should be defined and appropriate for the company specific risk profile and/or harmonized, as regards the period of their performance, with the company business plan.

Stress tests are very understandable and useful way to calculate how much capital the company needs in adverse situations that can be developed according to company previous knowledge about specific risks. They should be based on the expected adverse situation and its effect on the company financial position.

The ORSA Report should comprise a combination of quantitative and qualitative elements when assessing the material risks in the medium and long term strategy of the company. These include projections (deterministic and stochastic) of its future financial position and analysis of its ability to meet future regulatory and economic capital requirements. For qualitative assessment (and basic quantitative analysis application) frequency and severity matrix concept will be given in the next chapter.

In the same way, one of the following chapters will present the stress test for the bond portfolio in accordance with the standard formula for the calculation of the required solvency capital for market risk.

4. Frequency and Severity Matrix as Qualitative (and Initial Quantitative) Risk Assessment Method

The National Bank of Serbia Decision on the system of governance in an insurance/reinsurance undertaking provides that all such undertakings shall prepare a report on own risk and solvency assessment which contains, at a minimum, qualitative and quantitative results of the assessment of risks included in an undertaking's register. Risk register is a list of all risks that the undertaking is exposed to.

One way to do a qualitative analysis is by so called frequency severity matrix. This matrix is a good starting point for quantifying, qualifying and ranking of risks.

These matrices are probably one of the most widespread tools for risk evaluation in the initial phase. They are mainly used to determine the size of a risk and whether or not the risk is sufficiently monitored and controlled.

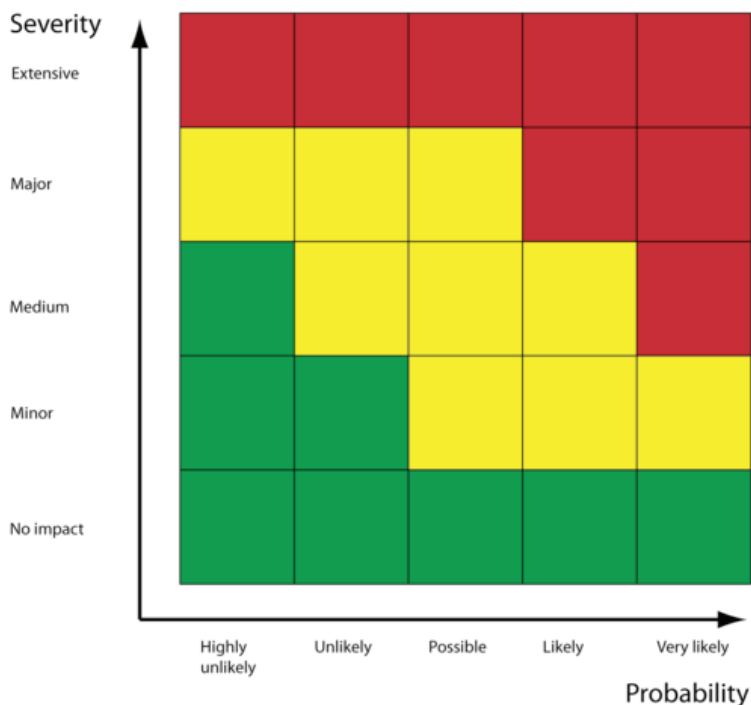
Frequency and severity matrix is a two dimensional matrix which includes the measure of frequency or probability of the risk occurrence and the potential severity or consequences of such occurrence. The combination of these two measures will give all risks a place on a risk matrix.

Most frequency and severity matrices have at least three areas for mapping risk into the matrix.

- The low frequency and severity area (usually green collared in practice) that indicates small probability of occurrence and/or adequate risk control. The risks within this group do not require special risk management activities.
- The high frequency and severity area (usually red collared in practice), indicating the specific risk which requires measures for reducing the frequency or severity of occurrence.
- The medium category (usually yellow collared in practice) is in between these two areas. The risks covered by this matrix area usually require more intense risk control measures. These risks are eligible for coverage if controlled and kept within the same matrix area.

The Graph below shows the example of risk frequency and severity matrix and three discussed areas. Companies should set frequency and severity scale according to the company structure, scope of activities and financial position.

Graph 1: Frequency and Severity Matrix



Source: <http://www.cgerisk.com/knowledge-base/risk-assessment/risk-matrices>

For the purpose of qualitative analysis (and basic quantitative analysis) frequency and severity matrix is a good way to rank the risks to which the Company is exposed. Risks can be ranked in various ways - because ORSA Report is an own risk assessment – but we shall present the three basic ways below:

- Worst case scenario. This is done by taking the worst adverse effect of a particular risk occurrence. This type of incidents is possible in actual business transactions, but is considered rather an exception than a rule.
- Current situation. The second strategy of evaluation of frequency and severity of a particular risk occurrence. This strategy takes into account all the claims history related to a particular risk.
- Future situation. This strategy tries to make an estimate of how the risk might go down after some period of time, with all risk control and mitigation actions.

Once they have been assessed, the risks are vertically and horizontally defined, according to the frequency and severity of their occurrence, in the risk management matrix for each and every risk included in the company risk profile. Frequency and severity matrix takes into account only two variables - in reality, there are other variables as well, such as the financial condition of the company, the size of the company, external market conditions etc.

For each and every risk included in its profile, the company should determine the way of risk management, according to the assessed frequency and severity of the risk occurrence. The Table below shows how risks should be managed according to their place on a frequency and severity matrix.

Table 8: Risk Management According to Frequency and Severity Matrix

Risks in a risk register	Low Frequency of Losses	High Frequency of Losses
Low Severity of Losses	Retention of risk	Retention with loss control—risk reduction, diversification, doubling resources
High Severity of Losses	Transfer of risks, diversification	Avoidance, Transfer of risks

Source: http://catalog.flatworldknowledge.com/bookhub/1?e=baranoff-ch04_s04

Risks within a low frequency and low severity group should be retained by the company itself. High frequency and low severity risks should also be retained by the company, provided the implementation of adequate control and risk management measures. The control may comprise the loss prevention to reduce the probability of loss occurrence and/or loss reduction to mitigate the loss severity. The low frequency and high severity risks should be transferred to some other party or diversified and the risks with high frequency and high severity should be avoided.

In the discussion above in this chapter, a basic measuring concepts for qualitative analysis of risks is given. Every insurance company should develop its own risk assessment system and carry on its risk management pursuant to such a system.

5. Interest Rate Risk within the Market Risk - Stress Test for Bond Portfolio

Stress testing is a risk management technique used with asset and liability portfolios to determine their reactions to different financial situations arising from unexpected occurrences.

As indicated above, stress testing should be embedded in a company's overall risk management system. A risk management system is defined as the group of strategies, policies and processes employed to identify, assess, monitor, manage and report on the material risks to which the company is exposed. Stress tests should also include company measures for risk mitigation under the stressful circumstances. It should be incorporated into the company's decision making process, including setting the insurer's risk appetite, the exposure limits and long term business planning.

Stress testing may be useful to quantify some of the risks which the company faces. Risks may lack data to build the statistical models to quantify. Also, some risks do not require more complex quantitative assessment methods as regards their nature, scale and complexity. Stress tests should complement risk quantification methodologies, by using the historical data. In particular, stress tests for a particular risk may be a valid proof of statistical models that are used in the quantification of such risk.

Regular stress testing can be a useful tool to monitor the risk exposures. The impact of stress testing will evolve over time as a result of the changing environment and other outer conditions.

Company should regularly maintain and update its stress testing framework. The effectiveness of the framework should be assessed independently and regularly. The stress testing framework should deal with types of stress tests, assessment of the impact of such stresses, mitigating actions assumed in the assessment and monitoring and reporting of stress tests.

Bond Portfolio Stress Test Examples

Bonds are a debt investment in which an investor (bond holder) loans money to an entity which borrows the funds. Funds are borrowed for a defined period of time at a variable or fixed interest rate.

Insurance Companies in Serbia mostly invest in governmental bonds with fixed interest rate, because this is a low risks investment.

Some characteristics of the bonds are: face value, coupon rate, maturity, effective interest rate – yield to maturity, bond rating, duration of the bond.

One of the characteristics of bonds that we are interested in (at this point) is an effective interest rate or yield to maturity. A bond's effective interest rate is the rate that will discount the bond's future cash flows to the bond's current selling price. The effective interest rate will be different from the stated or contractual coupon rate if the selling price of the bond is different from the face value of the bond.

The below formula describes the relationship between the fair value (selling price) of the bond and the effective interest rate – yield to maturity:

$$PV = \left(\frac{C}{(1+i)} + \frac{C}{(1+i)^2} + \dots + \frac{C}{(1+i)^n} \right) + \frac{FV}{(1+i)^n}$$
$$PV = \left(\frac{C}{(1+i)} + \frac{C}{(1+i)^2} + \dots + \frac{C}{(1+i)^n} \right) + \frac{FV}{(1+i)^n} \quad (1)$$

Where:

PV – present value of the bond (selling price)

FV – face value of the bond

C – coupon of the bond ($FV * c \%$)

n – number of payments (years if coupons are paid annually)

From the equation above it can be concluded that the present value of the bond is changing oppositely to an effective interest rate. When effective interest rate goes up present value of the bond goes down and when effective interest rate goes down present value of the bond goes up.

Such fluctuation of the bond price is due to many other reasons and factors (mostly market and economic) but at this point mathematically speaking – when you divide by a larger number the result is smaller number.

According to all said above, stress test for bond portfolio can be performed and the capital requirements for interest rate risk can be assessed.

Risk free rate and values for up and down stress testing of effective interest rate and by that calculating present value of bond, are given on EIO-PA (European Insurance and Occupational Pension Authority) website (link: <https://eiopa.europa.eu/CEIOPS-Archive/Documents/Advices/CEIOPS-L2-Advice-Market-risk-calibration.pdf>). Those rates can be used in stress test or other rates that the company considers appropriate for the analysis.

Those rates are added to the effective interest rate (i), thus stressing it (up and down) and present bond values are calculated as:

- discounted value of future cash flows using spot curve – risk free rate: PV1
- discounted value of future cash flows using up stress rate: PV2
- discounted value of future cash flows using down stress rate: PV3

These three values (PV1, PV2 and PV3) are the present values of the same bond under different conditions. The difference between those values gives a measure of capital for the interest rate risk calculated by a formula:

$$SCR = \max(\text{abs}(PV1 - PV2), \text{abs}(PV1 - PV3))$$

Where:

SCR means – Solvency Capital Requirement

PV1, PV2, PV3 are defined above.

This value (SCR) can be used to describe the fluctuation of bond prices due to market interest rate fluctuations.

6. Regulatory Requirements of the National Bank of Serbia for ORSA Report

Regulatory requirements of the National Bank of Serbia for ORSA Report are defined in Decision on the system of governance in an insurance/reinsurance undertaking. This Decision describes the way of organising the system of risk management in an insurance company, types of risks in the insurance industry, more detailed conditions and manner of identification, measurement, monitoring and management of such risks.

Decision highlights major risks to which the insurance company may become exposed in the course of its business: insurance risk, market risk, counterparty risk, liquidity risk, operational risk, legal risk and other material risks.

Major risks are divided in sub-risks, according to the allotment of the sub risks. In making a risk profile, company should include all the NBS listed risks and add some other risks that are inherent in the company's business.

Decision regulates that the company shall ensure that the results of its own risk and solvency assessment are taken into account in the company decision making and business planning.

The Decision also regulates that the companies shall document each of their own risk and solvency assessments and submit a report thereon to the company Board members. Under the Decision, the company shall prepare a report on its own risk and solvency assessment which contains, at a minimum, qualitative and quantitative results of the assessment, conclusions which are based on these results and the description of applied assessment methods.

Companies will do the assessment of deviation of their risk profile from solvency capital requirements pursuant to valid regulations. This shall include the qualitative and quantitative analysis of the significance of the deviation from the required solvency margin.

The valid regime for solvency requirements in Serbia is Solvency I. Capital requirements stipulate that the available solvency margin has to exceed the required solvency margin, calculated by a premium and claims method. Another requirement is that the guarantee capital has to exceed the nominal amount stipulated under the national Insurance Law.

Calculation of required solvency margin according to valid regulatory requirements includes few risks that are listed in the Decision, mostly insurance risks (technical provisions, reinsurance ...). Other risks should be measured and their measurements (qualitative and quantitative) presented in the company ORSA Report. That way, the major risks of the company will be highlighted and ranked. This is also a way for companies to develop their own risk assessment and quantitative models for estimating risk solvency capital and/or to

see whether the standard formula of Solvency II is applicable for some of the risks (because at this point, this is not a regulatory requirement) and, by all that, prepare for Solvency II regime implementation.

7. Conclusion

The valid regime for solvency requirements in Serbia is Solvency I. Capital requirements stipulate that the available solvency margin has to exceed the required solvency margin, calculated by a premium and claims method. Another requirement is that the guarantee capital has to exceed the nominal amount stipulated under the national Insurance Law.

Calculation of required solvency margin according to valid regulatory requirements includes few risks that are listed in the Decision, mostly insurance risks (technical provisions, reinsurance ...). Other risks should be measured and their measurements (qualitative and quantitative) presented in the ORSA Report. That way, the major risks of the company will be highlighted and ranked. This is also a way for companies to develop their own risk assessment and quantitative models for estimating risks and/or to see whether the standard formula is applicable for some of the risks (because it's not required at this point) and, by all that, prepare for Solvency II regime implementation over the given transitional period of time.

Literature

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