

OPERATIONAL RISK EFFECT ON INSURANCE MARKET'S ACTIVITY

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Abstract. The main aim of Solvency II framework is to establish new rules for insurance companies' solvency assessment in the European Union. The new Solvency II regime sets a lot of challenges to every insurance company, since it requires establishing new rules for risk evaluation that will change rapidly every insurance company's processes, systems, and functions, organizational and capital structure. The concept of the paper is to propose a short –term solution for operational risk management within the insurance companies of Latvia. The authors have developed risk culture implementation approach by using analytical hierarchy method which can serve as the first stage of the risk evaluation establishment according to Solvency II Directive requirements. By means of the conducted research the authors of the paper measure a possible effect of the operational risk on insurance company's activity in order to prepare the possible risk management plan.

Keywords – operational risk management, Solvency II framework, risk factors, risk culture

INTRODUCTION

Solvency II framework sets a lot of challenges for every insurance company, since it requires a more sensitive, balanced and sophisticated risk analysis to prepare and establish a better risk coverage. Therefore it is important to identify the risks that affect an insurance company's performance and development, since it may cause unexpected losses incurred from inadequate processes, people and systems, partners or from other events.

According to Solvency II regime, each insurance company should establish an effective risk evaluation system to ensure policyholders interest safety and the ability to prosper within the tough market environment.

The authors are concentrated on the main risk of an insurance company – operational risk management. Implementation of operational risk management in Latvia is still under development which ads impetus to understand the methods of their implementation within insurance companies' processes.

The Hypothesis of the article comprises the idea that an insurance company's activity can be improved with the amendment of operational risk evaluation principles according to Solvency II Directive's main requirements. The concept of the paper is to propose a short –term solution for operational risk management within the insurance companies of Latvia.

The object of the paper is operational risk management. Therefore, the subject is the improvement of operational risk management in an insurance company according to the Solvency II framework requirements.

In order to achieve the stated objective, the authors use theoretical and methodological analysis of the scientific literature, analytical methods and analytical hierarchy method, as well as comparative methods with the purpose to investigate the main components of operational risk management.

The main issue within the process of conducting the research was to interconnect operational risk management and insurance company processes. The article consists of three main sections. The overview of proposed operational risk management approach is presented in Section 1. In Section 2

the authors of the paper introduce the case study of operational risk sub - risk influence evaluation to main functions of an insurance company according to Solvency II regime. The final section summarizes the findings and conclusions of the research and assesses the improvement of risk evaluation.

1. ASSESSMENT OF THE OPERATIONAL RISK

Risk is the possibility of the occurrence of an insurance event with an impact the achievement of objectives. Risk management is the method of managing, planning, evaluating and controlling the processes of an insurance company with the aim to eliminate the possible risk of the insurance company and to improve its development, profit and financial results [3].

Operational risk is a change in value caused by the fact that actual losses, incurred for inadequate or failed internal process, people and systems, or from external events (including legal risk), differ from the expected losses. The point is that operational risk management is the process of identifying, analysing, assessing, organizing, planning, leading, controlling, eliminating and evading of operational risk events in order to minimize their occurring probability and reduce possible losses or near miss.

The authors present the operational risk approach for operational risk management establishment phase in Latvia in Figure 1.

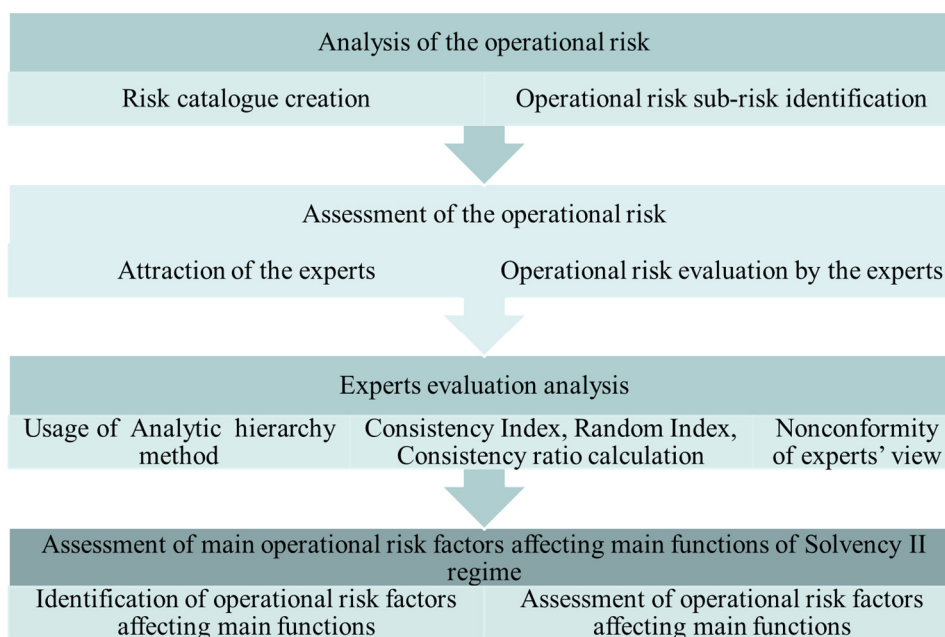


Figure 1. Proposed structure of operational risk management (created by the authors)

The authors have proposed an approach that should serve as a basis for the established operational risk management system.

The introduced approach of operational risk management can be included into the first stage of risk culture establishment within an insurance company (see Figure 2). Since the Latvian insurance market is rather young and is still developing, the authors also concentrate their attention on risk culture development.

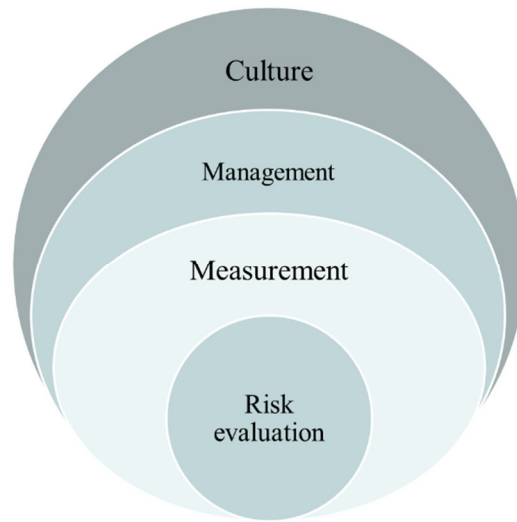


Figure 2. Risk culture role in Solvency II regime (the authors' interpretation)

Risk culture is more about risk nature understandability with the main aim to define risk tolerance, risk appetite and risk limits of an insurance company. Risk culture development can serve as the first stage for the next 2-3 year risk evaluation development in insurance companies, using an analytical hierarchy method.

Analytical Hierarchy Process is a theory which comprises expert evaluation measurement by means of pairwise comparisons according to derive priority scales. It is the scales that measure intangibles in relative terms. The fact is that the Saati hierarchy method measures how much one element dominates another with respect to the given attribute. Saati evaluation is based on the specific scale using pairwise comparison, presented in Table 1. During the case study experts should use these scales.

Table 1
Saati evaluation importance scale [18]

Importance definition		Description
1	Equal importance	Two risks contribute equally to the objective
3	Moderate importance	Experience and judgment slightly favour one risk over another
5	Strong importance	Experience and judgment strongly favour one risk over another
7	Very strong	A risk is favoured very strongly over another; its dominance is demonstrated in practice
9	Extreme importance	The evidence favouring one risk over another is of the highest possible order of affirmation
2, 4, 6, 8	Compromise between the above values	Sometimes one needs to interpolate a compromise judgement numerically

Calculation of expert evaluation using Saati hierarchy method should be ensured using consistency index (*CI*) (1) or consistency ratio (*CR*) (2), random index (*RI*) (3) that approves conformity of expert view [18].

$$CI = (\lambda_{\max} - n) / (n - 1), \quad (1)$$

$$CR = CI / RI, \quad (2)$$

$$RI = 1.98 (n - 2) / n, \quad (3)$$

where

$\lambda_{\max} \geq n$ are main eigenvalues of matrix. If matrix returns to a positive value then n - comparable elements $\lambda_{\max} \geq n$.

Saati and his colleagues at the Oak Ridge National Laboratory and at the Wharton School of the University of Pennsylvania have investigated the possible values of the random ratio.

During the research 500 random reciprocal $n \times n$ matrices were generated for $n = 3$ to $n = 15$ using the 1 to 9 scale. The Saati conducted research results is presented in Table 2.

Table 2
Random ratio values, investigated by Saati [18]

<i>RI</i>	MATRIX VALUES <i>N</i>									
	1	2	3	4	5	6	7	8	9	10
1980	0	0	0,58	0,90	1,12	1,24	1,32	1,41	1,45	1,49
2001	0	0	0,52	0,89	1,11	1,25	1,35	1,40	1,45	1,49

2. CASE STUDY: ASSESSMENT OF THE OPERATIONAL RISK USING ANALYTICAL HIERARCHY METHOD

The authors of the paper have performed the case study based on the summary of the views of the experts from different insurance companies of Latvia. During the case study the authors use priority and analytical hierarchy methods. The conducted research has approved the possibility of applying the proposed short –term method for operational risk evaluation in Latvia.

The proposed algorithm for operational risk management initial stage is explained below:

- Step 1: Identify operational risk sub-risk and create risk catalogue
- Step 2: Attract the internal experts of different functions of your insurance company
- Step 3: Ask internal experts independently evaluate operational risk sub-risk, using Saati scale
- Step 4: Calculate the importance of each sub-risk, using geometric mean of each
- Step 5: Check the conformity of calculated results with calculation of consistency index (*CI*), or consistency ratio (*CR*) and random index (*RI*).
- Step 6: If consistency ratio is less than 10% that you can say about the conformity of experts' view.

- Step 7: If consistency ratio is more than 10% that you can say about the nonconformity of experts' view. Additional experts' evaluation is needed.
- Step 8: Assess the main risk factors affecting main functions of Solvency II regime, using same experts evaluation
- Step 9: Make conclusions about main risk factors and the most important operational risk sub-risk
- Step 10: Create activity plan for operational risk possible harm elimination

During the research the authors have attracted experts from different Latvian insurance companies. Each expert has work experience of 2 and more years and introduces concrete process in an insurance company:

- actuarial function – independent function, responsible for risk measurement according to Solvency II framework, mainly involved in 1st Pillar;
- internal audit function – independent function, is involved in Solvency II Directive 2nd Pillar requirement fulfilment;
- risk management function – independent function, is responsible for risk evaluation, is involved in new regime 2nd and 3rd Pillar;
- compliance function – independent function, responsible for management actions controlling, planning and forecasting, is involved in 2nd Pillar.

The operational risk evaluation performed by the attracted experts, was analysed using Analytical hierarchy method, and is presented in the Table 3.

Table 3
Experts' evaluation, using Saati importance scale

Operational risk subrisk	Evaluation										Importance
	1	2	3	4	5	6	7	8	9	10	
1.Organizational risk	1	0.5	2	0.3	0.5	1	2	2	0.3	2	0.08
2.Reputational risk	2	1	2	0.3	2	0.5	2	4	0.5	1	0.10
3.Business disruption and system failure risk	0.5	0.5	1	0.3	2	1	4	2	1	2	0.09
4.Human resources risk	4	3	4	1	4	2	5	4	0.5	4	0.23
5.Client, products and business practices risk	2	0.5	0.5	0.3	1	2	0.5	2	0.3	2	0.07
6.Compliance risk	1	2	1	0.5	0.5	1	2	2	0.3	2	0.09
7.Execution, delivery and process management risk	0.5	0.5	0.3	0.2	2	0.5	1	0.5	1	0.5	0.05
8.External fraud risk	0.5	0.3	0.5	0.3	0.5	0.5	2	1	0.3	0.5	0.04
9.Information technology (IT) risk	4	2	1	2	4	4	1	4	1	4	0.20
10.Model risk	0.5	1	0.5	0.3	0.5	0.5	2	2	0.3	1	0.06

Based on the conducted research, the authors can conclude that the operational risk sub-risk with the biggest importance level is human resources risk that mainly identifies employment practices and workplace safety.

According to the analytical hierarchy method methodology, the conformity of expert evaluations should be proved (see Table 4).

Table 4

Conformity of expert evaluation

Ratio	λ_{\max}	CI	CR
Value	11.317	0.146	9.24%

The point is that the consistency ratio is less than 10%, therefore expert evaluations are conformed and can be used for risk evaluation.

In order to investigate the influence of the main risk factors of operational risk on key functions of insurance companies, the additional research was performed.

The authors have identified the main risk factors that can influence key functions of an insurance company and asked the attracted experts to evaluate them using separate probability of a importance ratio (W), probability of a risk occurrence (P), separate probability of a risk occurrence because of the factor (P_i). The conducted research is presented in Tables 5, 6 and 7.

Table 5

Identification of main factors affecting Audit function

Audit function factors	Evaluation		
	W	P	P_i
Lack of knowledge of insurance company's processes	8%	70%	6%
Lack of competence in insurance company's audit	22%	20%	4%
Lack of knowledge of Solvency II requirements	14%	40%	6%
Manual mistake in calculations	5%	90%	5%
Not appropriate education	18%	30%	5%
Management influence on audit	4%	90%	4%
High workload	6%	70%	4%
Changes in personal	11%	30%	3%

Table 5 presents that main risk factors influencing audit function are lack of the knowledge of insurance company's processes and lack of the knowledge of Solvency II requirements. Such tendency can be explained by the initial stage of the process of new regime requirements implementation, lack of experience in some specific processes.

Table 6

Identification of main factors affecting Risk management function

Risk Management function factors	Evaluation		
	W	P	P_i
Management influence on risk management	5%	90%	4%
Lack of knowledge in Solvency II requirements	9%	60%	6%
Lack in competence in risk assessment and management	5%	80%	4%
Changes in personal	28%	40%	11%
Incorrect interpretation of the ORSA requirements	22%	40%	9%
High workload	18%	70%	13%
Manual mistake in calculations	9%	60%	5%
Problems with time-management	22%	30%	6%

Based on the results presented in Table 6, the authors can conclude that main risk factors influencing risk management function are High workload and Changes in personal. Identified key risk factors can be explained by the lack of appropriate qualitative human resources in the risk management field.

Table 7
Identification of main factors affecting Actuarial function

Actuarial function factors	Evaluation		
	W	P	P_i
High workload	9%	80%	7%
Lack of knowledge in reserving	16%	50%	8%
Lack of knowledge in profitability calculations	16%	50%	8%
Manual mistake in calculations	4%	85%	3%
Management influence on actuarial function	7%	90%	7%
Incorrect performance of Liability adequacy test	11%	60%	7%
Changes in personal	18%	40%	7%
Lack of knowledge in IT systems	19%	40%	8%

The authors can conclude that the main influencing factors of an actuarial function are lack of knowledge in IT systems, lack the knowledge in reserving, lack the knowledge in profitability calculations. Identified key risk factors are connected with the level of actuarial knowledge, market appropriate and trustful statistics.

Based on the conducted research, the authors can conclude that an operational risk should be fully managed and interconnected between the decision making and estimated risk appetite, risk tolerance and risk limits, therefore it should be integrated into the insurance company's processes. Unfortunately, now for a cost of operational risk possible harm is allocated only ~ 5% of total risk management budget, but actual direct costs partially should be also included into operational risk possible harm evaluation. The authors' suggested approach can be easily implemented, since it does not require high financial expenditure and improves the risk culture integration with insurance companies' processes.

SUMMARY

Solvency II framework requires a more sophisticated, complex, sensitive risk evaluation with the aim to ensure solvency of every insurance company in the countries of the European Union.

The insurance market of Latvia is rather small and developing compared with that of the EU, therefore Solvency II Directive requirements should be established by means of another approach.

The authors concentrate their attention on operational risk management and operational risk influence on an insurance company's activity. The authors recommend to use a short-term method for operational risk management establishment using expert evaluations. The expert evaluation should be analysed using analytical hierarchy method.

The suggested approach is short-term, does not require high financial expenditure, and increases the level of knowledge of key employees helping integrate the risk culture into an insurance company's process. Moreover, risk evaluation should also educate key employees in risk nature comprehension.

The authors have performed case study based on experts from different insurance companies risk evaluations with the aim to study the importance of operational risk according to Solvency II Directive.

The suggested approaches of risk evaluation implementation in short-term will enable every insurance company to control trends within their development towards the solvency and will introduce a deeper understanding of risk nature that will allow in future to follow the Solvency II requirements and establish a more sophisticated and sensitive risk evaluation.

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