INVESTIGATION OF INSURANCE COMPANY FINANCIAL STABILITY: CASE OF BALTIC NON-LIFE INSURANCE MARKET

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Abstract. The concept of this paper is to investigate main indicators of insurance market stability according to the framework of the Solvency II directive. The authors have investigated financial ratios, planning tools, risk management approaches in order to evaluate stability of an insurance company. The main aim of an insurance company's stability analysis is to identify and assess possible risks that might occur in an insurance company. The authors have also offered an algorithm of insurance company's stability evaluation which might help realize and improve the management process of an insurance company. In order to achieve the stated objective, the authors use theoretical and methodological analysis of the scientific literature, as well as analytical, comparative and statistical methods with the purpose to study the elements of an insurance company's evaluation.

Keywords: financial ratios, stability, risk assessment, insurance, Solvency II Directive.

JEL classification: G22.

1. Introduction

The Baltic insurance industry is one of the most rapidly developing industries having regard to its annual increase in the market volumes. This is mainly connected with the improvement of the economic situation in the Baltics after a recession, as well as with an overall enhancement of the citizens' knowledge in the field of insurance. Most of the Baltic insurance companies are rather young and need to be developed in line with the market, therefore it is important to analyse, evaluate, and manage its activity.

The 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 the inadequate processes, caused by people, systems, and partners or occurred from other events.

The Baltic insurance market faces many challenges due to the Solvency II framework.

According to the 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.

In order to ensure solvency of an insurance company, there must be conducted an evaluation of its performance using financial indicators on the daily basis.

The authors are concentrated on a non-life insurance company's evaluation using financial indicators which ads impetus to understand the results of its performance within the insurance companies' processes. However, the authors also measure the concentration of the Baltic insurance market using main concentration evaluation indicators.

The Hypothesis of the article comprises the idea that an insurance company's activity can be improved by amending its performance evaluation using financial indicators.

The concept of the paper is to propose an evaluation model of an insurance company's performance to ensure its stability within the insurance companies of the Baltic countries.

The object of the paper is evaluation of the performance of an insurance company. Accordingly, the subject is the investigation of an insurance company's performance which might help prepare the Baltic market's participants for implementation of the Solvency II framework's 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 and statistical methods with the purpose to investigate the main components of the financial evaluation of an insurance company performance.

The main issue within the process of conducting the research was to interconnect operational financial analysis and an insurance company's processes. The article consists of four main sections. The overview of the main financial indicators, the Baltic market concentration measurement and the existing evaluation model of an insurance company's performance are presented in Section 2. In Section 3 the authors of the paper introduce the case study of the Baltic market's results evaluation and a new approach of the assessment of the non-life insurance company's performance to ensure the stability of its activity. The final section summarizes the findings and conclusions of the research and assesses the improvement of risk evaluation.

2. Description of Insurance Market Indicators

Risk is the probability of the occurrence of an insurance event with an impact on the achievement of objectives. Risk management is a 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 (Stepchenko *et al.* 2013)

The main purpose of the financial insurance indicators is to evaluate an insurance company's performance, identify and eliminate its possible risks which affect an insurance company's development.

In order to assess an insurance company's financial health, different financial ratios should be used. Traditionally, all insurance financial ratios are grouped into 4 groups (Voronova 2011; Comité Européen des Assurances and the Groupe Consultatif Actuariel Européen 2008):

- operating ratios that characterize the operational performance of an insurance company;
- profitability ratios that give the overview of financial performance of an insurance company;
- leverage or capitalizations ratios that measure the exposure of an insurance company's surplus to various operating and financial practices;

- liquidity ratios measure its ability to meet an insurance company' short-term financial obligations.

Irina Voronova (2011) in her paper emphasizes the three main groups of financial ratios that can be used in non-life insurance companies to evaluate their financial stability:

- solvency ratios that mainly characterize the operational performance of an insurance company;
- safety ratios that emphasize an insurance company's ability to undertake risks;
- competitiveness ratios which characterize insurance company competitiveness and its commercial potential.

The authors of the paper have investigated the existing system of the evaluation of the non-life insurance company's financial results that is presented in Figure 1.
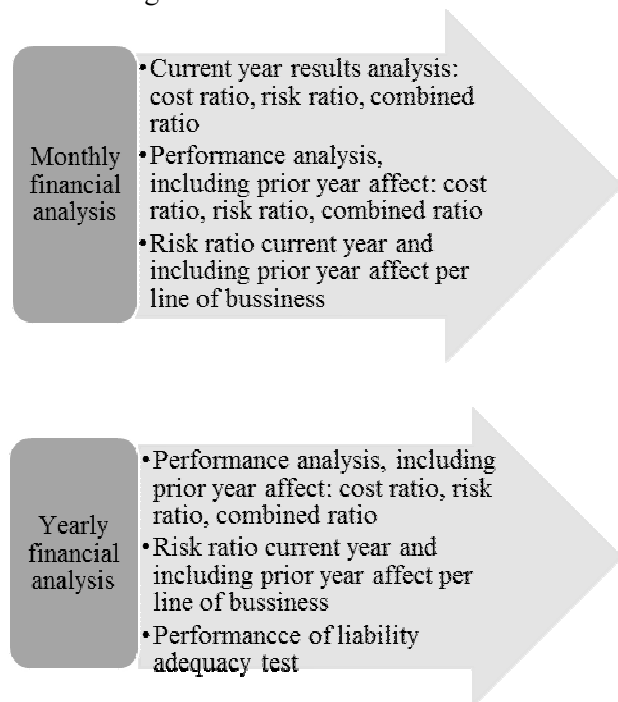

Monthly financial analysis
- Current year results analysis: cost ratio, risk ratio, combined ratio
- Performance analysis, including prior year affect: cost ratio, risk ratio, combined ratio
- Risk ratio current year and including prior year affect per line of bussiness

Yearly financial analysis
- Performance analysis, including prior year affect: cost ratio, risk ratio, combined ratio
- Risk ratio current year and including prior year affect per line of bussiness
- Performancce of liability adequacy test

Fig. 1. Actual analysis of an insurance company's performance evaluation in the Baltic countries (source: compiled by authors)

According to Figure 1, in order to evaluate a company's basic activity, insurance financial ratios which assess solvency of an insurance company, have been mainly used.

However, the main indicators are usually compared with the plan estimates and the outcome of the previous periods.

At the moment there are well-known several solvency models (Kartasheva *et al.* 2011; EIOPA 2008, 2010):

- the insurance regulatory information system is early warning tests based on 12 financial

ratios with the purpose to identify the more risky companies;

- the Solvency I directive requires the amounts of regulatory capital insurance undertakings against unforeseen events;
- fuzzy models are probalistic applications used in projection of liabilities, future and present values, pricing, asset allocations, cash flows, and investments;
- financial analysis and surveillance tracking system is the insolvency evaluation model based on twenty-nine audit ratios and corresponding scores for each ratio;
- rating systems is the simple evaluation models developed by rating agencies, such as Fitch, Moody's, Standard and Poor's based on the different concrete ratios rating comparison over the time.

In general, all the models are complicated and require a lot of financial and human resources to adapt them to daily result evaluation. Therefore, a simpler approach should be established. The authors propose a simpler solution for the daily evaluation of an insurance company's stability in Section 3.

The Solvency II framework requires a more sensitive and sophisticated risk evaluation for ensuring the solvency of insurance companies and protecting the interests of policyholders. Therefore, it is crucial to ensure the market stability using a more appropriate and complex scheme of the financial stability evaluation of an insurance company performance. In order to create the more appropriate approach for the Baltic non-life insurance company analysis, the authors investigated the concentration of each Baltic country. The authors have also investigated the concentration of the market based on the seven Baltic non-life insurance companies using three main indexes: concentration index, Herfindahl–Hirschman index, Theil's Entropy index (Dalton *et al.* 1977; Kramaric *et al.* 2012).

The research was conducted for each Baltic country separately and for the total Baltic market. The concentration analysis using concentration index is presented in Figures 2, 3, 4, 5.

According to Figure 2, the concentration of the Latvian insurance market has grown by 10 percent during last 10 years, which approves the fact that dominance of the leading Baltic companies is growing. The growth of concentration is connected with stability of the insurance market, therefore the authors can conclude that the Latvian insurance sector has become more stable during last years.
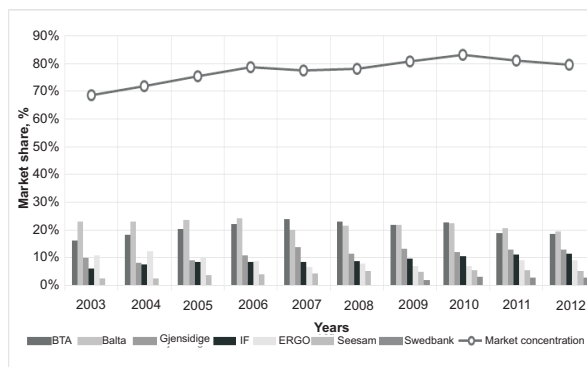

Fig. 2. The Latvian non-life insurance market analysis using concentration index (source: BTA, Balta, Gjensidige, IF, ERGO, Seesam, Swedbank (2003-2012); compiled by authors)
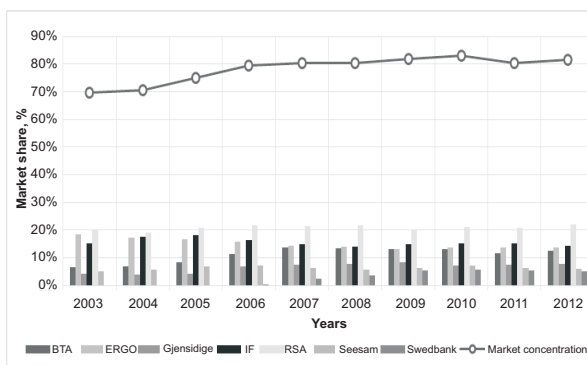

Fig. 3. The Estonian non-life insurance market analysis using concentration index (source: BTA, RSA, Gjensidige, IF, ERGO, Seesam, Swedbank (2003-2012); compiled by authors)

According to Figure 3, the concentration of the Estonian insurance market has grown by 10 percent during last 10 years. Estonian non-life insurance sector has a particularly high dominance over the leading Baltic companies that lead to the highest financial stability in Baltics.
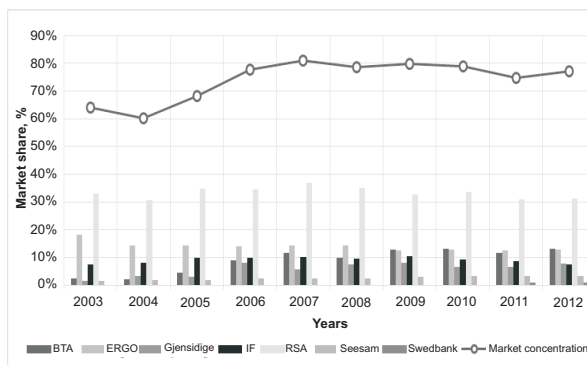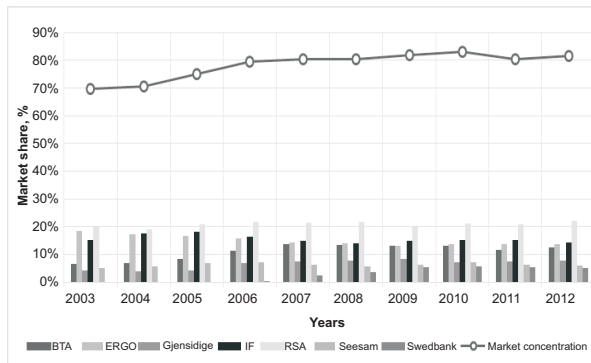

Fig. 4. The Lithuanian non-life insurance market analysis using concentration index (source: BTA, RSA, Gjensidige, IF, ERGO, Seesam, Swedbank (2003-2012); compiled by authors)

According to Figure 4, the concentration of the Lithuanian non-life insurance market has grown by 13 percent during last 10 years, which

presents the highest growth of concentration among the Baltic countries. However, the Lithuanian market has the lowest concentration level among the Baltic countries and the weakest profitability among the market participants.

Actually, market concentration is related to return on equity or return on CAR capital. Dalton and Levin (1977) stated that market shares and profit rates are directly related only in the high concentration subgroups. When the concentration is low, market share and rates of return are not related.

Fig. 5. The Baltic non-life insurance market analysis using concentration index (source: BTA, RSA, Gjensidige, IF, ERGO, Seesam, Swedbank (2003–2012); compiled by authors)

According to Figure 5, the authors of the paper can conclude that the concentration of the Baltic insurance market had grown by 12 percent during last 10 years and reached 82% in 2012.

The Herfindahl–Hirschman Index, which is close to 100%, is proper to monopoly markets, meanwhile Herfindahl–Hirschman Index between 1000 and 1800 means average concentration of the market, wherein an index which is bigger than 1800 characterizes high level of concentration of the market (Kramaric & Kitic 2012).

The concentration analysis of the Baltic market using Herfindahl–Hirschman Index is presented in Table 1.

Concentration index can be classified into 3 groups:

– Low concentration implies many market participants with average or small market shares and low financial stability level, since have limited resources to improve the processes and made correct pricing which negatively influences the total market development (in Table 1 marked with light grey color).

– Average concentration implies several bigger or average big market participants with average or high market shares and rather strong financial stability level which en-

sures stable market development. The average market concentration is the most favourable, since market development is dependent on many insurance companies' stability and differentiated bankruptcy risk. (in Table 1 marked with grey colour);

– Strong concentration implies few market participants with high market shares, wherein the market is fully dependent only on few market participants (in Table 1 is left blank).

Table 1. Baltic non-life insurance market analysis using Herfindahl–Hirschman Index (source: BTA, RSA, Gjensidige, IF, ERGO, Seesam, Swedbank (2003-2012); compiled by authors)

Years	Country			
	Latvia	Estonia	Lithuania	Baltic
2003	1054	2325	1479	1070
2004	1147	2597	1224	1071
2005	1244	2525	1550	1172
2006	1363	2339	1637	1212
2007	1309	2056	1837	1173
2008	1299	1674	1680	1157
2009	1308	1577	1583	1129
2010	1365	1617	1604	1174
2011	1196	1568	1387	1109
2012	1137	1535	1450	1161

According to the Herfindahl–Hirschman Index, the authors have investigated that the market concentration corresponds to the medium competitive level.

Theil's Entropy index is derived from the notion of entropy in information theory (Theil 1967). The concentration analysis using Theil's Entropy index is presented in Figure 6.
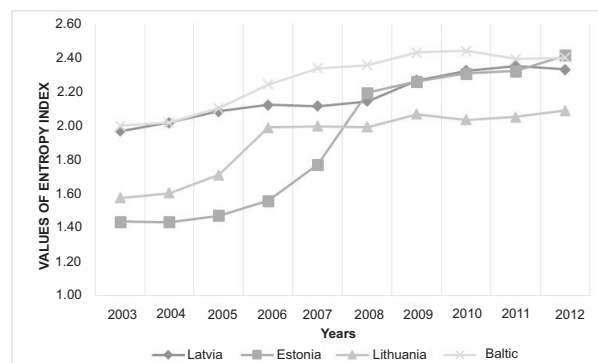

Fig. 6. The Baltic non-life insurance market analysis using Theil's Entropy index (source: BTA, RSA, Gjensidige, IF, ERGO, Seesam, Swedbank (2003-2012); compiled by authors)

On the basis of the introduced analysis the authors of the paper can summarize that Theil's Entropy index approves that the Baltic non-life insurance market is medium concentrated with index from 1 till 3, the lowest concentration is in the Lithuanian non-life insurance market.

According to the performed analysis, the concentration level of the Baltic insurance market is specified as average and allows to apply common approach assessing the solvency and financial health of each Baltic non-life insurance company.

3. Case study: new approach for Baltic non-life insurance company's financial stability evaluation

In order to prepare the universal model to assess each Baltic non-life insurance company's performance, the authors of the paper have investigated the financial situation of the Baltic non-life insurance market. The Baltic non-life insurance market development is presented in Figure 7.
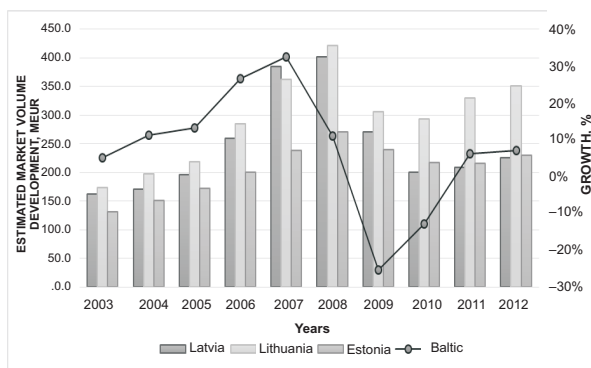

Fig. 7. The Baltic non-life insurance market volumes and growth analysis (source: BTA, RSA, Gjensidige, IF, ERGO, Seesam, Swedbank (2003-2012); compiled by authors)

On the basis of Figure 7 the authors of the paper can generalize that the Baltic non-life insurance market development has been heavily impacted by the economic downturn.

The biggest non-life insurance market is presented in Lithuania, meanwhile the market volumes in Latvia and Estonia are almost similar.

The authors analyze the Baltic insurance market's financial stability and solvency using following financial ratios:

- risk ratio shows the relation between incurred claims and net earned premiums;
- cost ratio is the net operating expense including claims handling proportion in earned premiums;
- combined ratio shows incurred claims and operating expense proportion in earned premiums.

The Baltic non-life insurance solvency analysis is presented in Figure 8.
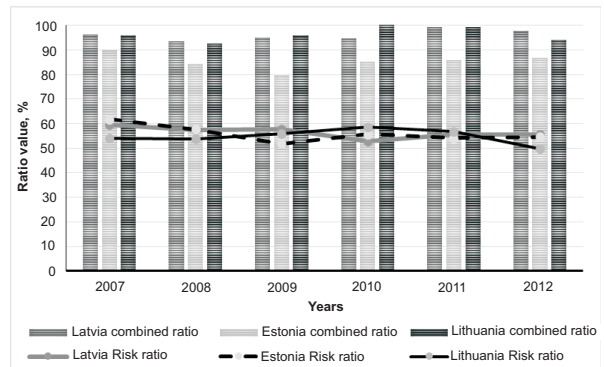

Fig. 8. The Baltic non-life insurance market solvency analysis (source: BTA, RSA, Gjensidige, IF, ERGO, Seesam, Swedbank (2003-2012); compiled by authors)

The Figure 8 shows that the Baltic market solvency is quite stable and less than 100% almost all periods.

The most profitable is the Estonian non-life insurance market with the lowest combined ratio within the last six years. In general, risk ratio and cost ratio of the Baltic non-life insurance market are considered to be at normal level, since combined ratio is lower than 100%, meanwhile the Latvian and Lithuanian non-life insurance markets' results should be more carefully managed with the control function. The fact is that the authors of the paper concentrate on following issues of insurance financial ratios:

- discover and evaluate significant differences between fair value of investments and their costs or amortized costs;
- check the equity section for unrealized gains (losses) and for a deferred policy acquisition cost build-up;
- check the adequate growth of the loss reserves with insurance in force;
- identify the main risk that can impact a non-life insurance company's development in short-term;
- identify the weaknesses of cost management.

The financial model created by the authors is based on the following main principles:

- don't create additional high workload to employees;
- don't require additional high financial resources;
- easy to understand, apply and integrate into processes;
- common approach which is easy to implement and integrate into the daily processes of an insurance company.

The core structure of a monthly financial assessment of the Baltic non-life insurance company performance is presented in Figure 9.
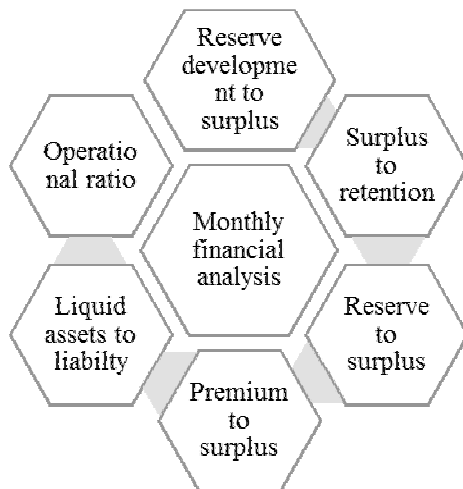

Fig. 9. Core structure of a monthly financial assessment (source: compiled by authors)

The core structure of the evaluation model fully describes and presents the overview of non-life insurance company performance.

The authors also would like to emphasize that a monthly financial assessment should be conducted using vertical and horizontal analysis principles.

The performance evaluation model for the Baltic non-life insurance company is presented in Figure 10.
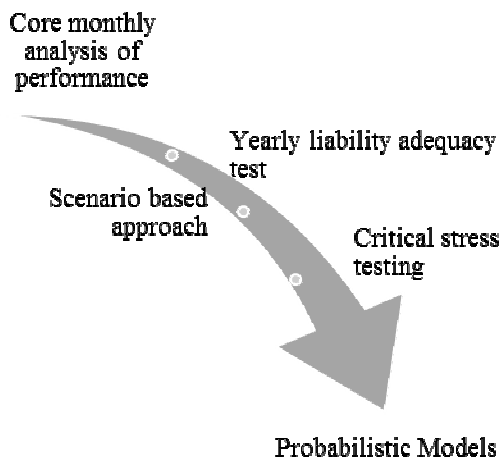

Fig. 10. The performance evaluation model for the Baltic non-life insurance company (source: compiled by authors)

According to the performance evaluation model for the Baltic non-life insurance company presented by the authors in Figure 10, the assessment should start with the monthly activity analysis and should end with a possible future development evaluation and a probabistic model's creation.

At the first stage the core financial analysis using vertical and horizontal analysis on monthly basis should be conducted. It is also important to follow up costs development (one of the operational ratio components) and try to optimize the cost structure of an insurance company.

At the second stage the Liability adequacy test to ensure adequacy of reserve level in an insurance company is to be prepared.

At the third stage one of the possible solutions to evaluate and assess possible short-term outcomes of an insurance company activity – strategic organizational planning tool – scenario planning is to be implemented.

Scenario planning is a multifunctional and detailed process of possible future short-term outcomes development of an insurance company's activity without claiming to forecast the future. Scenario planning allows investigating the future uncertainties and possible driving forces which have the impact on future, as well as it improves decision-making in an insurance company.

In conclusion, it is obvious that simulation models might provide the opportunity to test different strategies under different assumptions. This can be of great avail to simulate the scenarios already developed. However, in order to implement them successfully, the following guidelines should be satisfied (Fahey & Randall 1998).

At the fourth stage the possible future outcomes of an insurance company's activity forecasted using scenario planning through critical stress testing which allows conducting sensitivity analysis of the external factors' influence on an insurance company's possible development.

At the fifth stage probalistic models to ensure appropriate risk measurement in an insurance company should be integrated.

The performance evaluation model for the Baltic non-life insurance company should also improve the reliability of an insurance company.

Actually, the introduced model is part of risk self-assessment which increases every insurance company's reliability by means of risk monitoring at each business unit level.

The aim of the risk self-assessment framework is to identify, assess, control and mitigate insurance company's risks and to champion effective reporting of risk and emerging risk issues. (Stepchenko *et al.* 2012)

A non-life insurance company's evaluation is an excellent start point for the Baltic insurance companies to improve their risk management system and increase its reliability according to the Solvency II Directive's requirements.

4. Conclusions

The 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.

Financial strength is the key issue for a strong development of an insurance market. The insurance market of Latvia is rather small and is still under development compared with that of the European Union, therefore for the process of insurance risk evaluation the Solvency II Directive requirements should be established by means of another approach, using more sensitive and complex risk analysis.

On the basis of the performed research, the authors can conclude that the Baltic non-life insurance market is influenced by the macroeconomical situation in the Baltics and is quite stable.

According to the concentration analysis, the authors of the paper have come to a conclusion that the market concentration corresponds to the medium competitive level but concentration is increasing with each year.

The combined ratio has improved during last years, simultaneously, the Baltic non-life insurance companies have obtained profit from insurance activity.

The authors have prepared a new approach for the assessment of the Baltic non-life insurance company's performance which is based on four main stages:

– establish on a monthly basis core financial analysis using vertical and horizontal analysis.

– prepare Liability adequacy test to check the adequacy of reserve level in an insurance company.

– implement strategic organizational planning tool – scenario planning which is a short–term method suggesting the development of effective scenarios of an insurance company development with the purpose to eliminate its main risk.

– implement critical stress testing to conduct sensitivity analysis of the external factors' influence on an insurance company's possible development.

– implement probalistic models into insurance company's processes.

The suggested approach does not require high financial expenditure, nor does it create additional high workload for employees, meanwhile improving the risk assessment of an insurance company and increasing the reliability of an insurance company.

The suggested approach of the assessment of the Baltic non-life insurance company performance enables every insurance company to control trends within their development stage towards the solvency and introduces a deeper understanding of risk nature that will allow in future to follow the Solvency II requirements and to establish a more sophisticated and sensitive risk evaluation.

References

Balta. Annual reports. Available from Internet: http://www.balta.lv/lv/par-mums/darbibas-rezultati

Bryant, B.; Lempert, R. 2009. Thinking inside the box: A participatory, computer-assisted approach to scenario discovery, *Technological Forecasting and Social Change* 77(1).

BTA. Annual report. Available from Internet: http://bta.lv/lat/company/about-us/activities/

Cherlkasova, N.; Fadeeva, M. 2010. Внедрение сценарного подхода в разработку стратегии компании, *Корпоративные финансы* 2(14). Retrieved from http://ecsocman.hse.ru/data/2010/09/09/121499208 3/%D0%92%D1%8B%D0%BF%D1%83%D1%8 1%D0%BA14_cherkasova_fradkina_68_75.pdf

Comité Européen des Assurances and the Groupe Consultatif Actuariel Européen 2008. Solvency II Glossary.

Dalton, J.; Stanford, L. 1977. Market Power: Concentration and Market Share, *Industrial Organization Review* 5: 27–36.

Ernst&Young 2011. Embrace the Solvency II internal model. Available from Internet: http://www.ey.com/Publication/vwLUAssets/Embr ace_the_Solvency_II_internal_model/$FILE/Embr ace_the_Solvency_II_internal_model.pdf

Ernst&Young 2012. Progress in financial services risk management. Available from Internet: http://www.ey.com/Publication/vwLUAssets/Bank ing_and_financial_services_risk_management_sur vey_2012/$FILE/Progress_in_financial_services_r isk_management.pdf

Ernst&Young, Embrace the Solvency II internal model, 2011. Available from Internet: http://www.ey.com/Publication/vwLUAssets/Embr ace_the_Solvency_II_internal_model/$FILE/Embr ace_the_Solvency_II_internal_model.pdf

Ernst&Young, 2011. Solvency II Pillar - II. Available from Internet: http://www.ey.com/Publication/vwLUAssets/EY_ Solvecy_II_Pillar_II/$FILE/EY%20Solvency%20I I%20Pillar%20II.pdf

Ernst&Young, Progress in financial services risk management, 2012. Available from Internet: http://www.ey.com/Publication/vwLUAssets/Bank ing_and_financial_services_risk_management_sur vey_2012/$FILE/Progress_in_financial_services_r isk_management.pdf

Ernst&Young, Solvency II: Putting risk and governance at the heart of business, 2009. Available from In-

ternet:
http://www.ey.com/Publication/vwLUAssets/Solve
ncy_II_Putting_risk_and_governance/$FILE/Solve
ncy_II_Putting_risk_and_governance.pdf

European Insurance and Occupational Pensions Authority (EIOPA) 2010. Technical specification for Quantitative impact study 5. Available from Internet: https://eiopa.europa.eu/fileadmin/tx_dam/files/consultations/QIS/QIS5/QIS5technical_specifications_20100706.pdf

European Insurance and Occupational Pensions Authority (EIOPA) 2008. Final Report on Public Consultation No. 11/008 on the Proposal for Guidelines on Own Risk and Solvency Assessment. Available from Internet: https://eiopa.europa.eu/fileadmin/tx_dam/files/Stakeholder_groups/opinionsfeedback/IRSG_Final

European Insurance and Occupational Pensions Authority (EIOPA) 2008. Own risk and solvency assessment (ORSA). Available from Internet: https://eiopa.europa.eu/fileadmin/tx_dam/files/consultations/Issues PaperORSA.pdf

European Insurance and Occupational Pensions Authority (EIOPA) 2011. CEIOPS' Report on its fifth Quantitative Impact Study (QIS5) for Solvency II. Available from Internet: https://eiopa.europa.eu/fileadmin/tx_dam/files/publicati

European Insurance and Occupational Pensions Authority (EIOPA), 2010. Technical specification for Quantative impact study 5. Available from Internet: https://eiopa.europa.eu/fileadmin/tx_dam/files/consultations/QIS/QIS5/QIS5technical_specifications_20100706.pdf

European Insurance and Occupational Pensions Authority (EIOPA), 2008. Own risk and solvency assessment (ORSA). Available from Internet: https://eiopa.europa.eu/fileadmin/tx_dam/files/consultations/IssuesPaper ORSA.pdf

Fahey, L.; Randall, R. 1998. *Learning from the future: Competitive Foresight Scenarios*. ISBN: 0-471-30352-6

Gjensidige. Annual report. Available from Internet: http://gjensidige.lv/lv/about/finansu-atskaites/gada_parskati

Henschel, T. 2007. *Risk management practices in the main industries of German small to medium –sized enterprises an empirical investigation: An Empirical Investigation*. School of Accounting, Economics and Statistics. Edinburgh, UK.

IF. Annual report. Available from Internet: http://www.if.ee/web/ee/eng/aboutif/financialinformation/archive/pages/default.aspx

Kartasheva, A.; Traskin, M. 2011. Insurers' insolvency prediction using random forest classification. *Wharton University of Pennsulvania*. Available from Internet:
https://www.google.com/url?sa=t&rct=j&q=&esrc=s&frm=1&source=web&cd=1&cad=rja&uact=8&ved=0CCwQFjAA&url=https%3A%2F%2Fbepp.wharton.upenn.edu%2Ffiles%2F%3Fwhdmsaction%3Dpublic%3Amain.file%26fileID%3D3522&ei

=270gU8rjLqmk4gSXwYFI&usg=AFQjCNETFT
NhdLNJ5gWAxezBoisxF7THAA&sig2=VsVJe_1
_UsJ_ZvO0TMdlWw&bvm=bv.62788935,d.bGE

KPMG 2010. Solvency II readiness survey. Available from Internet:
http://www.kpmg.com/lv/en/issuesandinsights/articlespublications/publicationseries/pages/solvency-ii-readiness-survey-2012.aspx

Kramaric, P.; Kitic, M. 2012. Comparative Analysis of Concentration in Insurance Markets in New, *World Academy of Science, Engineering and Technology* Vol. 66. Available from Internet: http://waset.org/publications/582

Latvian Actuarial Association seminar (LAA), 2011.Critical situation analyses. Available from Internet:
http://aktuars.lv/faili/events/Seminars/laaaseminrskritiskas_situacijas_analize.pdf

Latvian Ergo. Annual report. Available from Internet: http://www.ergo.lv/par-ergo/finansu-informacija/ergo-latvija-aas/lv/

Lavelle, D.; O'Donnell, A.; Pender, D.; Roberts, D; Tulloch, D. 2010. *The Solvency II ORSA Process*. Available from Internet:
https://web.actuaries.ie/sites/default/files/event/2010/10/101123%20Solvency%20II%20ORSA%20Process%20Paper.pdf

Lietuvos draudimas. Annual report. Available from Internet: http://www.ld.lt/privatiems-klientams/apie-kompanij%C4%85/finansiniai-rezultatai

Lindgren, M.; Bandhold, H. 2009. *Scenario Planning: The Link Between Future and Strategy*. Basingstoke, Hampshire; Palgrave Macmillan, New York. ISBN: 0230579191

Lithuanian Ergo. Annual report. Available from Internet: http://ergo.lt/lt/pages/finansines-ataskaitos

Malins Morag 1999. Logistics and Operations Management Module Notes. Warwick Manufacturing Group.

Official Journal of the European Union, 2009. Solvency II framework. Available from Internet: http://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:335:0001:0155:en:PDF

Seesam. Annual reports. Available from Internet: http://seesam.ee/en/about-seesam/financial-results

Stepčenko, D.; Voronova, I. 2012. Ways of improving risk management function in insurance companies, in *Business and management*, Selected papers, Vilnius: VGTU Press "Technika", 92–99.

Stepčenko, D.; Voronova, I. 2013. Risk Management as a Tool to Improve the Reliability: Case of Insurance Company, *Journal of Social Science* 2(7): 48–56. Available from Internet:
http://www.ku.lt/leidykla/files/2012/09/Regional_formation_27.pdf .

Stepčenko, D.; Voronova, I. 2013. *Risk Management Improvement under Solvency II*, RTU Izdevniecība. ISSN1407-7337.

Swedbank. Annual reports. Available from Inter-net: https://www.swedbank.lv/par_swedbank/swedbank_p_c_insurance_parskati/

Theil, H. 1967. *Economics and Information Theory*. Amsterdam: North-Holland Publishing Company.

Torsten, W.; Brands, C.; Meissner, P. 2010. A scenario-based approach to strategic planning tool description – scenario Matrix. *Working Paper 4/2010.* Available from Internet: http://www.scenarioplanning.eu/fileadmin/user_upload/ToolDescription_Scenario_Matrix.pdf

Towers Watson 2011. Insights: Own risk and Solvency assessment. Available from Internet: http://www.towerswatson.com/ssets/pdf/4254/TW-EU-2011-20192.pdf

Towers Watson 2010. Risk Appetite: The Foundation of Enterprise Risk Management. Available from Internet:

http://www.towersperin.com/tp/getwebcachedoc?webc=USA2009/200906/ERMRiskAppetite_6-22-09.pdf

Voronova, I. 2011. *Technique for assessing realiability of insurance companies*. Vilniaus Gediminas Technical University (VGTU) Press Technika. http://dx.doi.org/10.3846/bme.2011.20

Wulf, T.; Meißner, P.; Stubner, S. 2010. *A Scenario-based Approach to Strategic Planning – Integrating Planning and Process Perspective of Strategy*. HHL Working Paper, No. 98. ISSN 1864-4562