EURASIAN JOURNAL OF BUSINESS AND MANAGEMENT

http://www.eurasianpublications.com

MODEL COMPREHENSIVE RISK ASSESSMENT OF THE INSURANCE COMPANY: TRADITION AND INNOVATION

Yulia Slepukhina

Ural Federal University, Russia. E-mail: julya.slepuhina@yandex.ru

Abstract

The article analyzes the traditional methods of evaluating financial risk arising from the insurance business, such as method correction norm of discount, method reliable equivalents, sensitivity analysis of efficiency criteria, analysis of the probability distributions, decision trees, method based on the fuzzy sets theory, and other, identified their advantages and disadvantages. In the study author proposes developed by him a model of the complex (integrated) risk assessment arising in insurance companies. It is proved that the greatest effect of risk management can be achieved by using an integrated approach to their assessment and analysis, i.e. considering different groups of risks arising from the activities of the insurance company, not abstracted from each other, and together, taking into account their mutual influence and the dynamics change.

Keywords: Insurance Company, Financial Risks, Absolute Risk, Relative Risk, Underwriting Risk, Risk of Inefficient Reinsurance, Risk of Formation of Insurance Reserves, Liquidity Risk, Interest Rate Risk, Currency Risk

1. Introduction

In modern conditions, the activity of any business entity is exposed and the impact (negative and positive) of the various risks. Moreover, this effect is most clearly manifested in such an important aspect of the aggregate of the company (financial institution), as investment in the financial markets, as the investor, creating an investment portfolio and managing them should be very quickly respond to changes in market conditions, economic and political situation in general. And from the point of view of financial risk management, in our opinion, the greatest interest is the investment activities of financial institutions such as insurance companies. The fact that insurers are affected by risks and negative impacts actually from two sides: on the one hand, they take the wrong risks that they are passed on various insurance and reinsurance contracts, and on the other-in the process of investment and other activities of the insurer having its own financial risks associated with non-return on investment or profit shortfall (Slepukhina, 2013).

Thus, a characteristic feature of the insurance business is the fact that on the one hand, insurance, as the main type of service the insurance company acts as one of risk management techniques, on the other hand, the insurance company as a market actor, she is potentially exposed to a variety of risks (Bokpin and Onumah, 2009).

In the context of overcoming the negative effects of the crisis problem of improving the investment performance of the insurance companies and improve the management of the investment potential of the insurance market as a whole, is of particular relevance (Gagnon and Gimet, 2013).

It should be noted that the effectiveness of the investment activities of Russian insurers since the beginning of de-monopolization of the insurance market is traditionally considered to be very low, although their investment potential especially in many ways surpasses the capacities of other institutional investors. This problem though and was seen by some Russian scientists, but is under-developed, in part because, in terms of the requirements of the state regulator of the insurance market of the insurer is not actually possible to build an effective investment portfolio in terms of the optimal combination of risk and return (Slepukhina, 2010a).

As has been said above, insurance companies are affected by the negative impact the various risks actually with the two directions. First, they take on other people's risks, which they passed on the various insurance contracts, co-insurance and reinsurance. Second, the insurer has its own financial risks, associated with non-return investment or lost profits, in the process of investment and other financial activities (Slepukhina, 2010b).

In our opinion, all risks, except for risks taken by insurance contracts (this is pure risk), are speculative, such as market, financial and investment. Consequently, the management of these risks should be taken into account:

1) the realization of the risk of an unfavorable outcome (negative-damages, losses, damages, i.e. losses)

2) and a favorable (positive effect of the implementation of risk-the additional profit, revenue, i.e. winning).

When people discuss minimization of the risk, they have in mind, of course, the first story-it is clear that the probability of such risks should be reduced, and the negative consequences of their implementation minimized. And the purpose of risk management is broader, complex and is, in our opinion, optimization of both criteria-namely, maximization the positive effect of the impact of the risks and minimization the negative impact of losses and damages.

2. Methods

The most common tools of analysis of financial risks of the insurer (first of all, we are discussing the risks arising from the placement of insurance reserves and own funds) will include the following (Jacoby and Zheng, 2010; Kazak and Slepukhina, 2013):

- method correction norm of discount;
- method reliable equivalents;
- sensitivity analysis of efficiency criteria;
- analysis of the probability distributions;
- decision trees;
- method of scenarios;
- Monte Carlo method;
- method based on the fuzzy sets theory.

In order to determine the most appropriate method in terms of the effectiveness and adequacy of risk assessment we analyze the above methods, the results of which are shown in Table 1.

Table 1. Comparative Characteristics of the Main Methods of Analysis of the Financial Risk of Insurance Companies (Slepukhina, 2011)

Method	Advantages	Disadvantages
The method correction norm of discount	•simple calculation; •accessibility; •the possibility of accounting a whole complex risks	•does not provide information about the risk degree; •increased risk over time is expected with a constant factor that is not always justified; •does not carry information about the probability distribution of future payment flows and allows you to get their assessment; •depends on the norm of discount, which limits the possibility of modeling of various scenarios
The method reliable equivalents	•carried bringing expected revenues to the values of payments	•the complexity of the calculations; •it is impossible to analyze the probability distributions of key parameters
Sensitivity analysis of efficiency criteria	•the possibility of accounting the effect of individual starting factors on the final result the project; •graphical visualization; •accessibility; •simple calculation	•Univariate - change each factor is considered in isolation, whereas in practice, economic factors correlated to varying degrees
Analysis of the probability distributions	•opportunity to obtain the necessary information to make decisions about the expected value of NPV and net revenues, as well as an analysis of their probability distributions	•application of the method assumes that the probability for all variants of cash flow known or can be accurately determined; •subjective probability distribution
Decision trees	•clear rules for the formation of the final probability estimates; •consideration of the relationship of individual phases (solutions); •consideration of different scenarios; •useful in situations where decisions depend on the decisions taken by the previous	•limiting the number of development options; •complexity of determining probabilities
Method scenarios	•the possibility of accounting the impact of complex factors difficult to formalize; •provide information about possible deviations	•considerable time; •complexity; •the possibility of a high degree of subjectivity
Monte Carlo method	•opportunity to account for various scenarios; •can be combined with other economic and statistical methods	•difficulty for the implementation (need to determine the distribution law); •need special software
Method based on the fuzzy sets theory	•flexibility; •simplicity	•the complexity of the calculations; •based on the need to predict the possible values of NPV, without a description of how it is supposed to do under conditions close to uncertainty

3. Results and Discussion

In our opinion, the greatest effect of risk management can be achieved by using an integrated approach to their assessment and analysis, i.e. considering different groups of risks arising from the activities of the insurance company, not abstracted from each other, and together, taking into account their mutual influence and the dynamics change (Vyatkin and Kazak, 2012).

Then the total amount of risk accepted for insurance contracts (absolute risk) is calculated as the sum of the relative risks associated with the maintenance of insurance contracts, as well as the external market environment risks (internal risks of the market environment do not have a significant impact on the insurance company, so they can be ignored under the proposed risk assessment methodology), weighted impact on the estimated absolute risk.

i.e. if we denote:

R_1 - the absolute risk received under insurance contracts;
R_2 - the absolute risk associated with service contracts;
R_3 - the absolute risk of external market environment;
r_1 - the relative risk received under insurance contracts;
r_2 - the relative risk associated with service contracts, and

$$r_2 = a_1 * r_{21} + a_2 * r_{22} + a_3 * r_{23}, \text{ where}$$
r_{21} - underwriting risk;
r_{22} - risk of inefficient reinsurance;
r_{23} - risk of formation of insurance reserves;

r_3 - the relative risk of the external market environment, and

$$r_3 = b_1 * r_{31} + b_2 * r_{32} + b_3 * r_{33}, \text{ where}$$
r_{31} - liquidity risk;
r_{32} - interest rate risk;
r_{33} - currency risk;

we obtain the following formula to calculate the absolute risk:

$$R_1 = c_{11} * r_1 + c_{12} * r_2 + c_{13} * r_3$$
$$R_2 = c_{21} * r_1 + c_{22} * r_2 + c_{23} * r_3$$
$$R_3 = c_{31} * r_1 + c_{32} * r_2 + c_{33} * r_3$$

The weighting coefficients a_i, b_i, c_{ij} (i, j = 1, 2, 3) are determined by the impact of specific relative risks calculated on an absolute or relative risk, i.e. for example, c_{12} - is a numerical expression of the impact of the relative risk r_2, related to service contracts of insurance on the value of the absolute risk R_1, received under insurance contracts; a_1 - a numerical expression of the impact of the relative risk of underwriting to the total value of the relative risk associated with service contracts of insurance.

On the basis of analysis of the financial performance of a number of Russian insurance companies, using empirical models and expertise, we have established a degree of influence of the above-mentioned relative risks calculated on an absolute or relative risks (i.e. weights a_i, b_i, c_{ij}) as follows (Slepukhina, 2010c):

Table 2. Evaluation of the Weighting Values

Weight Coefficient		Value
a1	Vector A	0,55
a2		0,25
a3		0,35
b1	Vector B	0,55
b2		0,30
b3		0,20

The weights cij be represented as a matrix C:

$$\begin{pmatrix} c_{11} & c_{12} & c_{13} \\ c_{21} & c_{22} & c_{23} \\ c_{31} & c_{32} & c_{33} \end{pmatrix} = \begin{pmatrix} 1 & 0,3 & 0,5 \\ 0,3 & 1 & 0,5 \\ 0 & 0 & 1 \end{pmatrix} = C$$

After determining the weighting factors is necessary to estimate the value of the relative risk rij. To do this, we analyzed the specific performance of the insurance organization, a specific range of values which we associated the following values relative risks (Slepukhina, 2006):

Table 3. Assessment of the Relative Risk Underwriting

Indicator	Values of the relative risk underwriting			
	0,7 critical risk zone	0,4 increased risk zone	0,1 satisfactory risk zone	0,01 minimal risk zone
Object insurance evaluation	Evaluation is made formally, features ignored	Evaluation performed poor quality, features practical not identified	Features incorporated partially	It takes into account all features of an object, which is reflected in the raising and lowering coefficients
Establishment and evaluation of insurance risks	Not made properly, without evaluation the probability of risks	Not all risks are installed, underestimated the probability of risks	Risks identified, but their individual type underestimated probability of realization	All possible risks are identified, estimation of probability of their realization made quite correctly
Evaluation of risk circumstances	Evaluation is not performed	Identified circumstances have no effect on the probability of occurrence of the events	Are revealed not all risky circumstances	Identify all risky circumstances affecting the probability of occurrence of the events

Similar manner, we assess the relative risk of the formation of insurance reserves, interest rate risk and currency risk.

The results of applying our proposed comprehensive risk assessment methodology in the insurance companies of the Ural federal district suggest that the developed method makes it possible to choose priorities in addressing risk management, i.e. the directions to minimize the risks that need to be implemented first. This consistent approach of solution the problem of risk

management is, in our opinion, the most high-quality and effective. First, when one selects the methods of risk management, risk with the greatest absolute value is emphasized. Second, it is possible to optimize the whole system of the risks, since the assessment of each absolute risk includes all the risks associated with the insurance and unrelated activities.

4. Conclusion

In conclusion, it should be noted that the usage of integrated assessment techniques outlined dimensions of various kinds of absolute risk in conjunction with the methods of analysis of financial risks will enable insurers to improve risk management strategies. Moreover, the improvement of risk management methods aimed at achieving the best financial results in terms of the optimal combination of risk and return parameters, which is essential in any business, and especially in the insurance.

References

Bokpin, G. and Onumah, J., 2009. An empirical analysis of the determinants of corporate investment decisions: Evidence from emerging market firms. *International Research Journal of Finance and Economics*, 33, pp.134-141.

Gagnon, M. and Gimet, C., 2013. The impacts of standard monetary and budgetary policies on liquidity and financial markets: International evidence from the credit freeze crisis. *Journal of Banking and Finance*, 37, pp.4599-4614. http://dx.doi.org/10.1016/j.jbankfin.2013.04.003

Jacoby, G. and Zheng, S., 2010. Ownership dispersion and market liquidity. *International Review of Financial Analysis*, 19, pp.81-88. http://dx.doi.org/10.1016/j.irfa.2010.01.008

Kazak, A.Y. and Slepukhina, Y.E., 2013. Modern methods of estimation of project risks: traditions and innovations. *Bulletin of UrFU: Series Economy and Management*, No.2, pp.13-26.

Slepukhina, Y.E., 2006. *Financial stability of insurance organizations: Theory, models and methods of risk management*. Yekaterinburg: Publishing House of AMB.

Slepukhina, Y.E., 2010a. *Investment portfolio of insurance organization: Financial mechanism of formation and management*, Yekaterinburg: Publishing House of AMB.

Slepukhina, Y.E., 2010b. Model of investment portfolio management of insurance organization. *University Bulletin (State University of Management)*, No.1, pp.59-64.

Slepukhina, Y.E., 2010c. *The investment portfolio of insurance company: Financial mechanism of formation and management*. Yekaterinburg: Publishing House of AMB.

Slepukhina, Y.E., 2011. Risk financial management of insurance organization: Innovation methods of estimation and analysis. *Strakhovoe Delo*, 2, pp.24-32.

Slepukhina, Y.E., 2013. Model of the formation of efficient investment portfolios on financial markets. *International Journal of Applied and Fundamental Research*, 2, pp.xx-xx. [online] Available at: <http://www.science-sd.com/455-24335>

Vyatkin, V.N. and Kazak, A.Y., 2012. The complex approach to the assessment and classification of financial risks: the formula and taxonomy of risks. *Bulletin of UrFU: Series Economy and Management*, No.4, pp.23-30.