FORECASTING MEDIUM TERM OUTPUT FINANCIAL FLOWS OF INSURANCE COMPANIES IN THE REPUBLIC OF BELARUS

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Ⓐ *This article deals with problems of forecasting output financial flows of insurance companies. The topic of the article is important because of the nature of insurance markets in post-socialist countries. The article aims to study methods of forecasting output financial flows of insurance companies in the medium term in Belarus. Strong government restrictions places on insurance companies have been counter-productive. It was proven that the initial prediction of financial flows should be based on all cash receipts, including investment income. It was found that for Belarussian insurance companies at their present stage of economic development the most appropriate methods of forecasting are the modified normative and correlation and regression methods.*

Ⓚ *Insurance company, output financial flow of insurance companies, forecasting financial flows, forecasting methods.*

ПРОГНОЗУВАННЯ ВИХІДНИХ ФІНАНСОВИХ ПОТОКІВ СТРАХОВИХ КОМПАНІЙ У РЕСПУБЛІЦІ БІЛОРУСЬ НА СЕРЕДНЬОСТРОКОВУ ПЕРСПЕКТИВУ

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Ⓐ *Стаття присвячена проблемам прогнозування вихідних фінансових потоків страхових компаній. Актуальність проблеми зумовлена специфікою розвитку страхових ринків країн постсоціалістичного простору. Метою статті є обґрунтування методики прогнозування вихідних фінансових потоків страхових компаній на середньострокову перспективу в Республіці Білорусь. Доведено недоцільність встановлення жорстких нормативів щодо вихідних потоків страхових компаній. Обґрунтовано, що прогнозування вихідних фінансових потоків має базуватися на всіх надходженнях грошових коштів, включаючи інвестиційні. З'ясовано, що для страхових компаній Республіки Білорусь на сучасному етапі розвитку економіки найбільш прийнятними методами прогнозування є модифікований нормативний та кореляційно-регресійний методи.*

Ⓚ *Страхова компанія, вихідні фінансові потоки страхової компанії, прогнозування фінансових потоків, методи прогнозування.*

ПРОГНОЗИРОВАНИЕ ВЫХОДНЫХ ФИНАНСОВЫХ ПОТОКОВ СТРАХОВЫХ КОМПАНИЙ В РЕСПУБЛИКЕ БЕЛАРУСЬ НА СРЕДНЕСРОЧНУЮ ПЕРСПЕКТИВУ

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Ⓐ *Статья посвящена проблемам прогнозирования исходящих финансовых потоков страховых компаний. Актуальность проблемы обусловлена спецификой развития страховых рынков стран постсоциалистического пространства. Цель статьи – обосновать методику прогнозирования исходящих финансовых потоков страховых компаний на среднесрочную перспективу в Республике Беларусь. Доказана нецелесообразность установки жестких нормативов относительно исходящих финансовых потоков страховых компаний. Обосновано, что прогнозирование исходящих финансовых потоков должно осуществляться с учетом всех поступлений денежных средств, включая инвестиционные. Определено, что для страховых компаний Республики Беларусь на современном этапе развития экономики наиболее целесообразным методом прогнозирования является модифицированный нормативный и корреляционно-регрессионный методы.*

Ⓚ *Страховая компания, исходящие финансовые потоки страховой компании, прогнозирование финансовых потоков, методы прогнозирования.*

Introduction

Output financial flows of insurance companies are part of the financial resources spent on operating an insurance company. The effective management of output financial flows is a key to the successful development of an insurance company and aids in timely payment of claims. Forecasting output financial flows is one of the most important components of financial flow management. A qualitative forecasting of output financial flow is able to prevent deterioration in the financial condition of an insurance company and thereby avoid crises. Various aspects of the management of financial flows are discussed in the research of national and foreign economists. H. Azarenkova explores the methodology of legal entity financial flow management[1]. However, the specific nature of financial flow in insurance companies has not been considered. The problems of optimizing the

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[1] Азаренкова Г. М. Фінансові потоки економічних агентів: методологія та організація управління: автореф. дис. на здобуття наук. ступеня канд. ек. наук: спец. 08.00.08 «Гроші, фінанси, кредит»/ Г. М. Азаренкова. — Суми, 2007. – 36 с.

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financial flow of industrial enterprises are shown in the publications of A. Maiboroda[2]. Issues of insurance company financial flow are represented in the work of T. Isacova[3], but in this work the specifics of the insurance market in the former Soviet Union area is not included. Western economists pay more attention to risk management of financial flows (Billio, M., Getmansky, M., Lo, A.W. & Pelizzon, L.)[4], systemic risks (S. Harrington)[5], and reinsurance securitization role in the management of financial flows (Cummins, D.J., & Trainar, P)[6], and insurance company yield prediction (D. Nissim)[7]. Dependence on financial stability and efficiency of financial flow management is discussed in publications by J. Cunliffe[8]. Issues related to insurance company management of financial flow in post-communist countries require further research. The purpose of the article is the substantiation of methods used in forecasting output financial flows of insurance companies in the medium term in Belarus.

Efficiency Estimation Procedure

Accounting of output financial flows are displayed as groups. They include the organization costs, insurance and compensation payments to insurance reserves, payments for reinsurance cooperation, etc. (table 1).

The results of the analysis of insurance company output financial flow dynamics in the Belarus Republic for 2004-2013 confirms the difficulty of identifying persistent trends in their changes. The study found that sharp fluctuations in individual financial flows were caused by different factors, including natural disasters. Based on this, the authors have attempted to find methods to study the forecasts of major financial flows which would take into account the context of the national program of economic development for stabilizing insurance companies.

We have considered the methods of forecasting insurance business expenditures. Their share is relatively small, 10-20%, but these financial flows play an important role in an insurance company's activity. This group of costs has more than 50 items, which is why the calculations for each outgoing financial flow is a tedious task. It was found that even in the case of detailed analysis, accurate predictions are difficult. It is important to find a rational and uncomplicated way of forecasting financial flows. For this purpose we studied the impact of different methods of study relevant indicators:

• Average annual growth of costs;
• Normative method, based on existing legislation;
• Modified method based on gross income;
• Correlation and regression analysis

The calculated results show that the first method does not ensure a reliable forecast. The use of standard method is also questionable, since this practice is applied only in Belarus. Under current law costs are tied to the volume of insurance premiums and type of insurance. Monitoring compliance with such regulations is very strict. The idea of applying standards significantly distorts the real need for financial resources to conduct insurance business. In our opinion, the continued use of mandatory standards requires

OUTPUT FINANCIAL FLOWS OF INSURANCE COMPANIES　　　　　　　　　　　　　　　　　　　Table 1

TYPES OF FINANCIAL FLOWS	COMMENT
The costs of conducting insurance business	Costs of labor, office expenses, depreciation of fixed assets, services of third-party organizations
Insurance payments	Damages in case of insurance claims
Deductions in insurance and other reserves	Deductions in technical and mathematical reserves, funds for preventive measures, guarantee funds
Other	Premiums and commissions for reinsurance cooperation, negative currency exchange rate differences, etc.

Source: created by authors

2　Майборода О. В. Оптимізація фінансових потоків промислового підприємства: теоретичні аспекти питання / О. Майборода // Економіка підприємства та управління виробництвом. – 2012. – С. 107–110.

3　Исакова Т. М. Управление финансовыми потоками страховой компании: автореф. дис. на соискание уч. степени канд. экон. наук: спец. 08.00.10 «Финансы, денежное обращение, кредит»/ Т. М. Исакова. – Москва, 2009. – 24 с.

4　Billio M., Getmansky M., Lo A. W. & Pelizzon L. (2010). Measuring systemic risk in the finance and insurance sectors. MIT Sloan Research Paper No. 4774–10.

5　Harrington, S. E. (2009). The financial crisis, systemic risk, and the future of insurance regulation . Journal of Risk and Insurance, 76 (4), 785–819.

6　Cummins D. J. & Trainar P. (2009). Securitization, insurance, and reinsurance. Journal of Risk and Insurance, 76, 463–492.

7　Nissim D. (2010). Earnings pred ictability in the insurance industry. Working Paper, Columbia Business School.

8　Cunliffe J. (2015), Financial stability, the Single Market and Capital Markets Union, speech at City of London Corporation and Open Europe conference, 20 January 2015.

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a clarification of the original cost basis for their calculation. We offer a count of the total amount of insurance premiums and income from investments. This will enable an increase in the reliability of the financial resource calculations insurers need. The importance of investment income is explained by the 4.5 to 9.6% insurance market growth in Belarus.

To calculate the amount of output financial flows to conduct insurance business we propose the use of a single standard. Statistical information about the Belarussian insurance market was obtained from the Belarus Ministry of Finance. Standard costs are calculated as the ratio of the actual value of the cost of doing business and the amount of insurance premiums and investment income (1):

$$N_{Rinv} = \frac{\sum_{i=1}^{n} \frac{R_i}{SP_i + DI_i}}{n} \quad , \qquad (1)$$

N_{Rinv} – standard costs for insurance company activity;

i – period from 1 to n years (i = 1, n);

n – number of periods for calculation;

R_i – cost for insurance business activity in i-th year;

SP_i – insurance premiums in i-th year;

DI_i – investment income in i-th year.

The average norm of the cost of doing insurance business taking into account investment income is 24%. On the basis of an improved method of calculating the ratio of the cost of doing insurance business we have made a reasonable forecast of the insurance business costs for the insurance company, Belgosstrakh, over five years (Table. 2).

Calculations show that the use of refined techniques increases the standard cost of doing insurance business by 8%. Increasing the amount of financial resources that can be used to conduct insurance business is able to stimulate investment activities of insurance companies. This will allow a strengthening of motivation

among employees and an improvement of the investment performance of insurance companies. In our view, cost restrictions of should be abolished in the future because they work counter to the market.

The most reasonable method is to forecast the output of financial flows using correlation and regression analysis. It allows an identification of the relationship between insurance company revenues and costs incurred. The calculation results for Belgosstrakh are represented in table 3.

On the basis of correlation-regression analysis the equation of relationship between the flow of financial resources and the cost of doing insurance business is defined (2):

$$y = 0,1899x + 15008, \qquad (2)$$

Dependence is linear, the coefficient of determination is 0.9976. The calculated results showed that in the medium term expenditure to conduct insurance business will increase by a factor of 4.3, while revenues will increase by 4.35. To form the output financial flows insurers must:

• extend the original database analysis to include income from investments;

• abolish mandatory standards costs of insurance activity, and instead apply the correlation and regression analysis to forecast the output financial flows.

The largest share in the output insurer financial flows is payments to policyholders. This amount is characterized by uncertainty due to the variability of factors. Analysis of insurance payments for the past 10 years makes it possible to draw conclusions about the nominal increase in insurance payments. At the same time the level of payments (the ratio of claims to premiums) in general varies dramatically. For example, in Belgosstrakh it went from 42 to 66%. Since this initial significant part of financial flows is particularly risky, we offer a forecasting technique based on the theory of large numbers, central limit theorem and the modified

THE COSTS OF DOING INSURANCE BUSINESS IN BELGOSSTRAKH FOR YEARS 2014-2018 BASED ON MODIFIED METHODOLOGY, MLN. RUBLES   Table 2

INDICATORS	2014	2015	2016	2017	2018
1. Costs of insurance, calculated under the current methodology	986 224	1 465 846	2 181 016	3 249 890	4 851 507
2. Investment income	354 357	512 247	740 486	1 070 420	1 547 361
3. The ratio of costs calculated with investment income	85 046	122 939	177 717	256 901	371 367
4. The maximum amount of the cost of doing insurance business (r. 1+ r. 3)	1 071 270	1 588 785	2 358 733	3 506 791	5 222 874

Source: calculated by authors

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FORECAST OF THE COST OF DOING INSURANCE BUSINESS BELGOSSTRAKH IN 2014-2018 USING CORRELATION AND REGRESSION ANALYSIS, MLN. RUBLES   Table 3

INDICATORS	2014	2015	2016	2017	2018	RATIO FOR 5 YEARS
1. The total amount of premiums	4 473 089	6 477 844	9 352 033	13 487 923	19 472 004	4,35
2. Investment income	354 357	512 247	740 486	1 070 420	1 547 361	4,37
3. Total income (r. 1 + r. 2) (x)	4 827 446	6 990 091	10 092 519	14 558 343	21 019 365	4,35
4. The value of the cost of doing insurance business (y)	931 740	1 342 426	1 931 577	2 779 637	4 006 585	4,30

Source: calculated by authors

method of VaR. The calculation results showed that the mean of payments for all types of insurance of Belgosstrakh is $a = k' = 54.4$ $a = \bar{k} = 54.4$, a $a = \bar{k} = 54.4$, assessment standard deviation level of payments insurance companies over the period is 7.83. The level of payments will be in the range of (3) the reliability of 95%:

$$\text{VaR}_{max} = 54,4 + 7,83 \cdot 1,96 = 69,7\,\%. \qquad (3)$$

Thus, it was found that there is a 95% probability that the level of benefits for all types of insurance from Belgosstrakh in the future will not exceed 69.7% of gross income. This figure reflects the maximum risk. Given the range of values, bilateral risk cannot be less than 39.1%. The present figure at the same time reflects the level of financial risk insurance company in the medium term. The results of predicted insurance claims are presented in table 4.

The calculated forecast should be annually adjusted to the changing situation in the insurance market. The data which is presented in table 4 were calculated with a confidence level of 95%, meaning the amount of deductions were included in insurance reserves. According to Belarussian legislation, insurance reserves include provisions for unearned premiums reserve, declared but not settled losses, actual reserves, but not reported losses. According to current practice, first reserves are designed to cover future losses, and the two other reserves are for current damages. Thus,

it is necessary to calculate only additional allocations to other funds. The estimated amount of the respective funds offer assessed by functional dependence of the detected value of the premiums and choosing the best coefficient of determination ($R2 = 0,9856$) and linear function $y = 0,0392x + 10384$.

A small part of the financial flows (other expenses) include several diverse types of costs: premiums for reinsurance, indemnity reinsurance commission, negative exchange rate differences and others. For their prediction the exponential function $y = 6592,3\,e^{0,2809x}$ was used. Forecasted payments of all output financial flows are presented in table. 5

Predictive calculations of the output financial flows can be used to predict the income tax. Predictive calculations of income tax provided saving rates 18% are presented in table 6.

An increase of net income for insurance companies is the basis of a sustainable development of the insurance market. In this case, the initial prediction of financial flows is also a management tool of profit. The accuracy of predicting input and output financial flows actually is one of the most important elements of financial flow of the insurance company since it allows predicting the size of the financial basis for further development.

Conclusions and recommendations for further research. Thus, the specificity of the insurance market of Belarus requires development of specific approaches to forecasting output financial flows of

FORECAST OF MAXIMUM INSURANCE CLAIMS OF BELGOSSTRAKH FOR YEARS 2014-2018, MLN. RUBLES   Table 4

INDICATORS	2014	2015	2016	2017	2018
1. The total amount of premiums	4 473 089	6 477 844	9 352 033	13 487 923	19 472 004
2. Insurance payments (p. 1 · 69,7 %)	3 117 743	4 515 057	6 518 367	9 401 082	13 571 987

Source: calculated by authors

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THE FORECAST OUTPUT FINANCIAL FLOWS OF BELGOSSTRAKH, MLN. RUB.   Table 5

INDICATORS	2014	2015	2016	2017	2018
1. The costs of conducting insurance business	931 740	1 342 426	1 931 577	2 779 637	4 006 585
2. Insurance payments and payments to insurance reserves	3 117 743	4 515 057	6 518 367	9 401 082	13 571 987
3. Payments to the funds of damages	178 392	248 127	347 515	490 751	699 322
4. Other costs	144 865	191 848	254 068	336 468	445 591
5. The total output financial flows	4 372 740	6 297 458	9 051 527	13 007 938	18 723 486

Source: calculated by authors

FORECAST FOR NET PROFIT AND INCOME TAX OF BELGOSSTRAKH, MLN. RUB   Table 6

INDICATORS	2013 (REFERENCE)	2014	2015	2016	2017	2018
1. Input financial flows	3 674 870	5 033 209	7 288 071	10 522 712	15 178 787	21 915 077
2. Output financial flows	3 401 238	4 372 740	6 297 458	9 051 527	13 007 938	18 723 486
3. Taxable profit	273 632	596 503	897 980	1 337 451	1 977 972	2 913 142
4. Corporate income tax (p. 3 · 18 %)	75 889	107 371	161 636	240 741	356 035	524 366
5. Net profit (p. 3 – p. 4)	197 749	489 133	736 344	1 096 710	1 621 937	2 388 777

Source: calculated by authors

insurance companies. The necessity of insurance company's financial flow forecasting can be explained by the fact that it is the basis for forecasting the need for financial resources, as well as an important element of profitability for insurance companies. Under the current legislation of Belarus, forecasting output financial flows is based on the standard method, which severely limits the cost of doing insurance business based on revenue premiums. This approach does not stimulate investment activity of insurance companies. We offer as an alternative a modification of the regulatory method and calculation of the ratio of output financial flows from all cash receipts, including those from investing activities. In the future it is necessary to cancel the strong limitations of output financial flows and forecast output financial flows in the medium term will be based on correlation and regression analysis, which makes it possible to take into account market conditions.

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