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EVALUATION OF INSURANCE PORTFOLIO

ОЦІНКА СТРАХОВОГО ПОРТФЕЛЯ

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The article discusses the peculiarities of forming a balanced insurance portfolio and a system of indicators of the insurance organization's portfolio assessment. The main features of the balanced insurance portfolio and the essence of its main indicators are considered: the number of objects in the portfolio, the maximum insurance amount of own maintenance under the agreements in force for the period in question, the indicator of the uniformity of the portfolio and the equilibrium coefficient of the insurance portfolio, the estimated insurance portfolio, the expected return of the insurance portfolio and profitability by types of insurance transactions. It is noted that the optimization of the insurance portfolio is understood as reducing the level of risk and increasing the financial stability of the portfolio. The practical value of the research lies in the formation of an insurance portfolio assessment system.

Keywords: insurance portfolio, insurance portfolio indicators, balanced insurance portfolio, portfolio homogeneity coefficients, calculated insurance portfolio.

У статті розглянуто особливостей формування збалансованого страхового портфеля та систему показників оцінки портфеля страхової організації. Формування системи оцінки страхового портфеля є передумовою забезпечення фінансової стійкості та платоспроможності страховика. Метою статті є узагальнення та систематизація підходу до оцінки портфеля страхової організації. Показано, що аналіз якості портфеля проводиться за такими ознаками: вивчення асортименту страхової компанії, оцінка фінансових результатів кожного виду страхування і кожного договору з метою розподілу видів страхування, договорів страхування і страхових ризиків на сприятливі і несприятливі. Аналіз структури портфеля передбачає визначення частки сприятливих, несприятливих і нейтральних ризиків, та частки ризиків, на які можна вплинути і на які вплинути неможливо. Показники оцінки портфеля зазвичай розглядаються в динаміці, що дозволяє відстежити тенденції їх змін та ще до отримання остаточних результатів фінансово-господарської діяльності за звітний період своєчасно вжити заходів для підвищення рентабельності того чи іншого виду. Розглянуто сутність основних показників страхового портфеля: кількість об'єктів у портфелі, максимальна страхова сума власного утримання за діючими за розглянутий період договорами, показник однорідності портфеля та коефіцієнт рівноваги страхового портфеля, який показує, чи розвивається даний вид страхування, чи знаходиться в стані стагнації або навпаки, йде скорочення знову укладених договорів страхування та являє собою відношення кількості договорів, що закінчилися до діючих на розглянуту звітну дату, розрахунковий страховий портфель, очікувана доходність страхового портфеля та рентабельність за видами страхових операцій. Зазначено, що під оптимізацією страхового портфеля розуміють зниження рівня ризику і підвищення фінансової стійкості портфеля. Визначено основні ознаки збалансованого страхового портфеля на основі показників однорідності, ступеня ризику страхового портфеля та максимальної величини одиничного ризику за договорами страхування. Практична цінність дослідження полягає у формуванні системи показників оцінювання страхового портфеля.

Ключові слова: страховий портфель, показники страхового портфеля, збалансований страховий портфель, коефіцієнти однорідності портфеля, розрахунковий страховий портфель

В статье рассмотрены особенности формирования сбалансированного страхового портфеля. Показано, что управление портфелем включает в себя: оценку качества портфеля и оценку показателей страхового портфеля. Также проанализирована система показателей оценки страхового портфеля: количество объектов в портфеле, показатели однородности портфеля, коэффициенты равновесия портфеля (которые показывают, развивается ли данный вид страхования, и представляет собой отношения количества договоров, которые закончились, к действующим на отчетную дату), расчетный страховой портфель, ожидаемая доходность страхового портфеля и рентабельность по видам страховых операций. Под оптимизацией страхового портфеля понимают снижение уровня риска и повышение финансовой стойкости портфеля. Практическая ценность исследования заключается в формировании и обобщении системы показателей оценки страхового портфеля.

Ключевые слова: страховой портфель, показатели страхового портфеля, сбалансированный страховой портфель, коэффициенты однородности портфеля, расчетный страховой портфель

Posing a problem. In modern conditions, the focus of efforts of theorists and insurance practitioners aimed at forming and maintaining a balanced insurance portfolio. The main goal of forming an insurance portfolio is to achieve the optimal ratio between risk and income of the insurer. Balancing the insurance portfolio reduces the cost of reimbursement of losses, the cost of maintaining the portfolio and doing business, reducing the risks of the insurer, increasing the recovery of insurance contracts, as well as changing the tariff policy taking into account current pricing trends, which ultimately determines the financial stability of the insurance company. The relevance of the research topic is due to the need to study methodological approaches to ensuring the balance of the insurance portfolio and its assessment.

Analysis of recent researches and publication. A balanced insurance portfolio is one of the most important indicators of insurance company solvency and financial stability. Theoretical bases of essence, value and mechanism of formation of insurance portfolio, systemic analysis of approaches to its optimization and portfolio estimation indicators are investigated in the works of such domestic scientists as Baranov A. [1], Tarasenko N.S. [2], Havtur O.V. [3] and others. However, the works do not consider the general system of indicators of the insurance portfolio, but also individual ones.

The purpose of the article is to generalize and systematize the approach to assessing the insurance organization portfolio.

Presentation of the main material. An insurance portfolio is the cost of insurance risks taken on insurance with a set of certain financial instruments that ensure the financial stability of the insurance organization, considering the principles of equivalence, balance and efficiency. It reflects the structure of the undertaken insurance obligations. In turn, the volume of insurance obligations indicates the future financial situation and dynamics of the insurance com-

pany development. The financial reliability of the insurance company depends on a number of factors, among which the state of the insurance portfolio, the structure of which determines the amount of insurance premiums formed by insurance reserves and payments to the company. With this approach, the insurance portfolio can be considered as an integrated tool for insurer solvency management.

Let summarize the researchers' works and determine the main features of a balanced insurance portfolio:

1. The portfolio should be quite large.
2. The portfolio is considered as homogeneous when the deviation of insurance amounts from the minimum and maximum does not differ from the average insured sum more than twice.
3. The portfolio must be diversified, i.e. territorial risk diversification and diversification of risks over time should be ensured in the portfolio.

When forming a portfolio, special attention should be paid to the dependence of risks on each other. If the occurrence of one insured event entails simultaneous damage to many insured objects or any particular risk is affected by the occurrence of other risks (property insurance against fire and losses from the interruption of the insurer's activities as a result of a fire), then a large number of similar dependent risks in the insurer's portfolio can be considered as a single risk.

The portfolio risk distribution is characterized by the following features:

1. Uniform risk distribution (classic version) – the loss of the insured amount fluctuates around the average loss rate within the risk surcharge.
2. Uniform risk increase. The loss rate of the insured amount within the risk surcharge evenly fluctuates around the average value, but the average value increases from year to year.
3. Catastrophic risk distribution. With this distribution there is an uneven distribution of loss in time – for some period of time, the loss rate fluctuates evenly around some average value, then

there is a sharp increase in unprofitability, and again a return to some average value.

Two main stages of portfolio manager's activity can be determined: portfolio quality analysis and portfolio valuation indicators analysis [3, p. 146–150]. Analysis of portfolio quality is carried out on two ways:

1. The study of the types of insurance of the company, the financial results of each type of insurance and each contract in order to distribute the types of insurance, insurance contracts and insurance risks to favorable and unfavorable ones is carried out.

Risks and contracts are considered favorable if they are well predictable and using actuarial methods, the insurer can determine and evaluate them. These risks are characterized by a slight deviation between the expected and actually obtained result, that is, statistics on such risks are known. From the other hand, favorable contracts and risks are profitable (for example, transport insurance).

The risks with opposite indicators are unfavorable: new risks with lack of statistics; difficult risks to predict; unprofitable contracts and risks due to market conditions; risks that may become unprofitable in the near future due to the actions of external factors; risks that threaten one-time large damage (cosmic risks); long-term contracts and those insurance contracts whose investment income growth is far less than the inflation growth rate.

2. After studying and classifying risks, the portfolio structure is analyzed, that is, the share of favorable, unfavorable and neutral risks is determined, the share of risks that can be influenced and cannot be influenced is also assessed.

Analysis of portfolio valuation indicators is carried out in the following areas:

Each type of insurance is considered separately, with a sample of risks carried out for a period of at least 12 months from the current date. Since contracts for risky types of insurance are mainly concluded for a period of 12 months, the recommended sampling period "smoothes

out" emissions and fluctuations in portfolio indicators, as opposed to those calculated in a shorter period (six months, quarter) and is much more reliable for forecasting. All indicators of the portfolio are better considered in dynamics, which allows to track the trends of their changes for better or worse. Tracking the dynamics of portfolio indicators allows to take timely measures to increase the profitability of a particular type before obtaining the final results of financial and economic activity for the reporting period.

Portfolio indicators are calculated as follows [3, p. 144–146; 5, p. 224–225; 5, 6]:

1. Number of objects in the portfolio. For each specified reporting date, the number of insured objects under contracts is determined, valid for this date.

2. The maximum insurance amount of own maintenance under the agreements in force for the period under review. (The legislation stipulates that the maximum insurance amount under the contract should not exceed 10% of the amount of the insurer's own funds at a single risk).

3. The indicator of portfolio homogeneity. Under existing contracts, the total insurance amount of own maintenance is calculated as well as the ratio of the maximum insurance amount of own content to the average and average sum insured amount to the minimum is calculated.

In a homogeneous insurance portfolio, these coefficients should be less or equal to 2. If these coefficients are more than two, then a comparative analysis of the reasons that led to the heterogeneity of the portfolio is carried out, and measures are taken to eliminate heterogeneity (table 1):

4. Equilibrium coefficient (Kr): the ratio of the number of contracts that have expired to the current ones at the considered reporting date. This method shows whether this type of insurance is developing, whether it is in a state of stagnation or vice versa, there is a reduction in re-concluded insurance contracts. In a balanced portfolio, the equilibrium coefficient should be less than 1:

Table 1

Calculation of portfolio homogeneity coefficients

Indicator	Calculation formula	Explanation
Ko_1 – the first coefficient of homogeneity	$Ko_1 = \frac{Sv_{max}}{Sv}$	Sv_{max} – maximum insurance amount of own content; Sv – the average insurance amount of own content.
Ko_2 – the second coefficient of homogeneity	$Ko_2 = \frac{\overline{Sv}}{Sv_{min}}$	Sv_{min} – minimum insurance amount of own content.

$$K_r = \frac{K_z}{K_d}, \quad (1)$$

where K_z – the number of contracts in force;
 K_d – the number of contracts that have ended.

This indicator is especially important to expect during the period of inflation, when there is an increase in insurance amounts due to the increase in the cost of living.

Baranov A. L. [1, p. 114–115] to find out and assess the balance of the insurance portfolio submits a set of indicators by which qualification takes place, namely:

- the number of new insurance contracts and the number of contracts that have expired (and this should take place in the context of the range of insurance services provided by the insurance organization on the market);

- the amount of collected insurance premiums under new contracts and the amount of premiums, under insurance contracts that have ceased to work;

- the amount of total insurance risk accepted for insurance under new insurance contracts and the amount of risk that was accepted for insurance under terminated insurance contracts;

- the average validity of new insurance contracts and the corresponding validity period of terminated contracts;

- aggregate sum insurance amount under new contracts and aggregate sum insurance under terminated insurance contracts;

- the number of objects accepted for insurance under new insurance contracts and the number of objects that were insured under suspended insurance contracts.

Calculated insurance portfolio (P_c) – the number of valid insurance contracts at the reporting date, increased by the number of contracts terminated during the reporting period due to the expiration of the insurance period, the occurrence of insured cases and early termination of the insurance period.

$$P_c = C_e + C_r + C_{i.e} + C_s, \quad (2)$$

where C_e – the number of existing contracts at the reporting date;

C_r – the number of contracts that expired during the reporting period;

$C_{i.e}$ – the number of contracts under which the insured event took place and insurance payments were made in full;

C_s P – the number of contracts terminated for objective and subjective reasons.

The expected return on the insurance portfolio (k_p) is the average return on certain types of insurance. These values constitute the portfolio shares invested in each individual asset:

$$k_i = \sum_{i=1}^n \omega_i k_i, \quad \omega_i = \frac{X_i}{\sum_{i=1}^n X_i}, \quad \sum_{i=1}^n \omega_i = 1 \quad (3)$$

where k_i – average return of the same type of insurance in the insurance portfolio;

ω_i – share of the same type of insurance in the structure of the insurance portfolio,

n – the number of types of insurance included in the portfolio;

X_i – the amount of insurance premiums for the same type of insurance.

To obtain a more accurate and reliable result, the profitability indicator ($kand$) must determine profitability of insurance operations types:

$$R_i = (ZP_i - SV_i - VV_i) / SP_i, \quad (4)$$

where R_i is the profitability of the same type of insurance;

ZP_i – earned premiums for the same type of insurance;

SV_i – insurance payments for the same type of insurance;

VV_i – the cost of doing business on the same type of insurance;

SP_i – the amount of insurance income for the same type of insurance.

By optimizing the insurance portfolio, one will understand the reduction of the risk level and increasing the financial stability of the portfolio.

Having determined the subject area of research on optimizing the structure of the insurance portfolio, the conceptual statement of the problem and the development of a sequence of stages of solution are of importance. Based on this, it is necessary to carry out:

- determining the problem, which within the framework of this study is an insufficient level of financial stability of insurers;

- identification of the purpose; that is, among the alternative variants of shares of each type of insurance (forming an insurance portfolio), the choice of those that would allow not only to optimize the structure of the insurance company's portfolio, but also to ensure the sustainability of the insurer.

- detailing the defined purpose of the study in the context of specific tasks that need to be solved.

The formation of an effective portfolio is based on modern portfolio theory, separate provisions of which were developed by G. Markovitz [7], V. Sharp and other scientists. Portfolio theory is based on the mechanism of portfolio optimization with the specified criteria of the ratio of its profitability and risk.

According to Tereshchkenko T. E. [8, p. 68–69], the indicators used by Markovitz's model to calculate the optimal investment portfolio find their analogues in insurance. Thus, the return on the security is similar to the profitability of the type of insurance.

The risk of a security in a model is calculated as the average quadratic deviation of income. Therefore, Markowitz's model in its basic approaches is quite acceptable for use in the field of choosing the optimal portfolio of insurance services.

The main features of a balanced insurance portfolio based on homogeneity indicators, the degree of risk of the insurance portfolio and the maximum value of single risk under insurance contracts are systematized in Table 2.

Let consider the main factors that ensure balanced portfolio.

Underwriting is a comprehensive work carried out by the insurer on admission to risk insurance, including their assessment, determination of insurance capabilities, choice of optimal coverage, verification of compliance of risks and customers with the goals and objectives of the insurance organization, in terms of the security and balance of its insurance portfolio. Thus, the composition and structure of the insurance the insurance company's portfolio directly depends on the quality of the underwriting, which, in turn, is due to the qualification of the specialist underwriter authorized by the insurer to accept decision on taking a risk on insurance, adjust the tariff by entering amendment coefficients, as well as making changes in the terms of the insurance contract.

Tariff policy of the insurance organization has a significant impact to the level of insurance portfolio risk. Reducing insurance tariffs, the insurer seeks to increase the portfolio amount due to attract new customers, however, low tariffs do not guarantee increasing the number of concluded insurance contracts, and therefore, the amount of insurance premiums.

The impact of the personnel policy of the insurance company is due to the fact that the presence of highly qualified employees who faithfully perform their direct duties, allows you to timely take into account the above factors and, consequently, to form a balanced insurance portfolio, which is the key to the sustainable functioning of the insurance company in the insurance market.

Reinsurance is a tool for achieving the effect of equalization of insurance amounts, which is

necessary to comply with the principle of uniformity of the company's insurance portfolio.

In turn, the formation of a balanced insurance portfolio is one of the basic conditions for ensuring the financial stability of the insurance company.

Thus the optimization model of insurance portfolio should provide:

- identification of the main criteria of a balanced insurance portfolio and providing them with quantitative and qualitative determination;
- formation of the structure of the insurance portfolio, which satisfies a set of the following features: coefficient of homogeneity and probability of occurrence of insured cases;
- ensuring a high and sufficient level of solvency of the insurance company;
- the possibility of achieving effective functioning of the insurer on the basis of maximizing the level of profitability of operating activities through reinsurance;
- taking into account the peculiarities of reinsuring operations, that is, both active and passive, as well as bond and optional reinsuring, as well as types of insurance.
- overcoming the uncertainty of the future cost of concluding reinsurance contracts.

Conclusions. The insurance portfolio is the basis on which the insurer's entire activity is based and which determines the financial reliability of the insurance organization as a whole. In this regard, it is important to ensure the financial stability of the insurer by forming an optimal insurance portfolio, as well as the issue of methods of managing and evaluating the insurance portfolio to achieve its balance. A full analysis of the state of the insurance portfolio of the insurance organization provides for a comprehensive analysis, that is, portfolio quality analysis (risk structure analysis and portfolio structure analysis) and portfolio valuation indicators analysis. The portfolio measure system includes different indicators (as uniformity, equilibrium ratios etc.), provides for a multilateral assessment of the insurance portfolio and is used to measure the state of the insurance portfolio, which provides multiple and adequate ratings.

Table 2

Main features of the optimal (balanced) insurance portfolio

Features of the optimal portfolio	Characteristics of the trait
Uniformity of the insurance portfolio	The distribution of insurance amounts corresponds to the norm
The degree of risk of insurance portfolio	Should not exceed 10%
The share of great risk	Should not exceed 10% of the insurer's own funds
The rate of the reinsurer in insurance operations	Should not exceed 45% so as not to cause dependence on the reinsurer

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