ASSESSMENT OF SOCIETY'S READINESS FOR MODERN CHALLENGES OF THE INSURANCE MARKET

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The article summarizes the theoretical aspects of the insurance market. The authors systematize the main approaches to determining the specifics of the insurance sector based on a review of publications of foreign and domestic scientists. The aim of the study is to assess the readiness of society to the challenges of the insurance market as one of the leading elements of the financial system. The article identifies the main trends in the activities of insurance companies. The authors have analyzed the following indicators: the volume of insurance premiums to the total population, the share of life insurance, the ratio of total insurance premiums to GDP, the volume of total insurance premiums to the number of employees in the insurance sector, the ratio of reinsurance and the share of insurance premiums kept on the accounts of insurance companies. To achieve the purpose of the study, factor analysis, principal components method, built on the basis of statistically significant indicators, integral index of the degree of readiness of society to modern challenges of the insurance market for OECD countries were used. The methods of generalization, comparison, analysis, synthesis, tabular and graphical research tools were also used. The results of the factor analysis confirmed the statistical significance of the analyzed indicators of insurance activity. This leads to constant monitoring of the insurance sector in the context of various services and products offered.

Keywords: insurance market, financial relations, challenges, globalization, factor analysis, integral indicator.

JEL Classification: E44, G20, G22

Introduction. As part of the financial sector, the insurance market is one of the most developed capital markets in the world. There are many approaches to its definition and positioning in the regulatory framework. Insurance and financial relations are very close, as they have similar features.

Financial and insurance relations are distributive and monetary, which contributes to the creation of money funds. However, on the other hand, there are significant differences between these relationships. Financial relations involve one-way movement of value, unlike insurance relations. In addition, insurance relations are probabilistic in nature, while financial relations are more clearly defined.

The absurdity of the definition of insurance generally accepted in the scientific environment causes the limited possibility of assessing the impact of insurance on social and economic aspects of society. Thus, this determines the relevance of this article, and the primary goal is to determine the main vectors and trends inherent in the modern insurance market.

Globalization processes taking place in the modern world are no longer something new and unusual, but have become a natural part of the development of society. The insurance market, as a significant component of the financial sector, is also undergoing many transformations.

Segmental consolidation of insurance, banking and financial capital at the international level creates the basis for the formation of transnational economic groups. Thus, the analysis of society's readiness to the challenges of the insurance market is of great practical importance and requires more detailed study.

Problem statement. The question of analyzing the insurance market and society's readiness for its challenges was dealt with by many domestic and foreign scientists, including K. V. Bagmet and O. Gaponova [2], S. Bozhena and N. Vynnychenko [3], A. Klyuchkov and M. S. Mayakova [4], I. Molotok [5], C. Gibb and L. Hammerstron [6], E. Seben and R. Machova [7], and others.

O. Gaponova and K. V. Bagmet, S. Bozhena and N. Vynnychenko noted that it is necessary to take into account the current conditions for the introduction of innovations in the process of development of the insurance market of Ukraine and the world and to implement it in the formation of policies of both the public and private sectors [2; 3].

Also, scientists increasingly began to consider the segmental consolidation of insurance, banking and financial capital at the international level as a tool for the formation of transnational financial groups [4; 5]. It contributes to the positioning of countries in the world

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market of financial goods and economic development of the state at the national level.

Foreign scientists are actively researching trends in the development of the insurance market [6, 7]. Over the past five years (2015–2020), there have been significant changes in the market environment in terms of full computerization and digitalization. This is the basis for revising the insurance sector and developing and implementing new services in the future.

The international community, represented by a number of global organizations (World Bank, IMF, OECD), considers the insurance market as one of the sectors of macroeconomic stability of the state [1; 8; 9].

Thus, the issue of insurance market analysis is constantly studied and adapted to modern challenges.

Formulation of the goals of the article. At the present stage of development, the economy of any country faces various challenges that have both positive and negative impact on the sectors of the state economy. Thus, the purpose of the article is to assess the readiness of society to the challenges of the insurance market as one of the leading elements of the financial system. The tool to achieve this goal is to build a generalizing integral indicator, which will include the leading indicators of insurance companies.

Results of the research. The readiness of the society for modern challenges of the insurance market can be analyzed by means of the corresponding integral indicator, which is determined on the basis of six key indicators of the insurance market development: the ratio of insurance premiums to the total population, the share of life insurance, the ratio of total insurance premiums to GDP, the ratio of total insurance premiums to the number of employees in the insurance sector, the reinsurance ratio and the part of insurance premiums kept on the accounts of insurance companies. The higher the value of this indicator, the

higher the readiness of society to modern challenges of the insurance market. The values of the listed insurance market indicators for OECD member countries for 2010–2020 are used as input data (Table 1).

Since the input indicators are not proportional (they have different units of measurement), it is necessary to normalize them in order to continue further calculations with them and to obtain an interpretable value of the integral indicator. Usually, the min-max method is used to normalize the input data, which is the basis for the calculation of the integral indicator, which allows for the appropriate normalization of incentive and disincentive indicators.

In this case, all input indicators play the role of stimulants, so to normalize (1) the following formula will be used.

$$\bar{x}_{in}^t = \frac{x_{in}^t - \left(x_i^t\right)}{\left(x_i^t\right) - \left(x_i^t\right)}, \qquad (1)$$

where $\bar{x}_{in}^t$ – the normalized value of the indicator of the n country in the t year;

x_{in}^t – the value of the indicator of the n country in the t year;

$min\ (x_{ic}^t)$ – minimum value averaged over all years and countries;

$max(x_{ic}^t)$ – maximum value averaged over all years and countries.

The normalized values of the input data are presented in the following table (Table 2).

At the next stage, it is necessary to determine the weight of each studied indicator in the integral indicator. With the help of weighting coefficients, it is possible to take into account the impact of practical activities on the formation of a critical indicator. There are two groups of methods that allow to create scales. The first group

Table 1 – Indicators of developing the insurance market of OECD countries for 2010–2020 [1]

Year	The volume of insurance premiums to the total population, dollars	Life insurance share, %	Ratio of total insurance premiums to GDP, %	The volume of aggregate insurance premiums to the number of employees in the insurance sector, dollars	Accepted reinsurance ratio	Part of the insurance premiums that are kept on the accounts of insurance companies, %
№	1	2	3	4	5	6
2010	2993,3	49,6	8,6	555018,9	12,9	82,6
2011	3167,8	52,9	8,5	531474,3	13,0	82,3
2012	3080,0	53,2	8,3	665093,6	14,9	82,1
2013	3016,4	52,7	8,1	318544,9	15,4	81,5
2014	3171,7	50,2	8,4	333913,1	15,4	82,5
2015	3037,0	49,2	8,5	333823,6	16,6	80,7
2016	3186,2	46,5	8,7	710683,0	18,4	79,4
2017	3292,9	45,4	8,8	919678,2	17,2	79,6
2018	3489,167	50,264	8,866	960371,7	11,765	85,593
2019	3555,879	50	9,03	1104146,6	11,776	85,02
2020	3600,038	48,234	9,447	1073934,2	11,573	84,294

Table 2 – The normalized values of the input data are presented in the following table [1]

Year	The volume of insurance premiums to the total population, dollars	Life insurance share, %	Ratio of total insurance premiums to GDP, %	The volume of aggregate insurance premiums to the number of employees in the insurance sector, dollars	Accepted reinsurance ratio	Part of the insurance premiums that are kept on the accounts of insurance companies, %
	1	2	3	4	5	6
2010	0,00	0,54	0,40	0,30	0,19	0,52
2011	0,29	0,95	0,33	0,27	0,21	0,46
2012	0,14	1,00	0,13	0,44	0,49	0,44
2013	0,04	0,93	0,00	0,00	0,56	0,34
2014	0,29	0,61	0,20	0,02	0,56	0,51
2015	0,07	0,49	0,34	0,02	0,74	0,21
2016	0,32	0,14	0,49	0,50	1,00	0,00
2017	0,49	0,00	0,51	0,77	0,82	0,03
2018	0,82	0,62	0,58	0,82	0,03	1,00
2019	0,93	0,59	0,70	1,00	0,03	0,91
2020	1,00	0,36	1,00	0,96	0,00	0,79

consists of quantitative methods, in particular factor analysis, data volume analysis, unobserved component models. The second group includes expert assessments, which determine weights based on their expert judgment. A critical disadvantage of the expert assessment method is that they are often subjective, and there are difficulties in matching the assigned weight to reality. Therefore, the latter approach has not gained much popularity, and preference is given to the first group of methods.

In this study, the weighting coefficients of each indicator under study will be determined using factor analysis. This will help to obtain an economically sound solution, since each weighting coefficient will determine the correlation influence of the corresponding indicator within the research topic. This analysis will be carried out using the mathematical software STATA/SE 11.1.

One of the main stages of factor analysis is the selection of the optimal number of factors that will allow to identify groups of significant indicators. First of all, it is worth paying attention to the cumulative variance allocated by all factors. It is considered that if the factors give more than 70% of the cumulative variance, then this number is optimal for the study. In other words, 70% of the phenomenon under study can be described by those indicators that are included in these factors. Secondly, to confirm the optimal number of factors, Kaiser's criterion is also used (by default, this value is equal to one), on the basis of which a rockfall graph is constructed. Moving from left to right along the line of this graph, it is possible to trace the place where the line slows down its dynamics. Usually, this point corresponds to the optimal number of factors.

A table with the eigenvalues of the factors, as well as the cumulative variance, is presented below (Table 3).

Considering the results presented in this table, in particular, the value of cumulative variance from the last column, it can be seen that the first two selected factors explain more than 92% of the phenomenon under study. That is, the optimal number of selected factors is exactly two. In addition, this thesis is confirmed by the graph of rocky scree (Fig. 1), where, starting from the third factor, the Kaiser criterion is less than one, and the graph slows down its dynamics.

The next step is to calculate the weighting coefficients for each indicator of the insurance market.

To do this, the following formula (2) will be used.

$$w_i = \frac{|fl_i|\, p_k}{\sum_i^k |fl_i|\, p_k},\qquad(2)$$

where w_i – weight factor for the indicator i;

fl_i – statistically significant factor loading of the i indicator;

p_k – share of the total variance of the k factor.

There will be presented a table with factor loadings of the investigated indicators (Table 4).

Statistically significant factor loadings are highlighted in gray in the table. As can be seen, the selected factor loadings are close to unity, which indicates the high significance of each of the studied indicators of the insurance market.

Substituting the variance of the factors and the corresponding factor loadings, the following weighting coefficients are obtained (Table 5).

As can be seen, the most significant value in the structure of the integral indicator of the degree of readiness of

Table 3 – Eigenvalues and variance of selected factors (author's development)

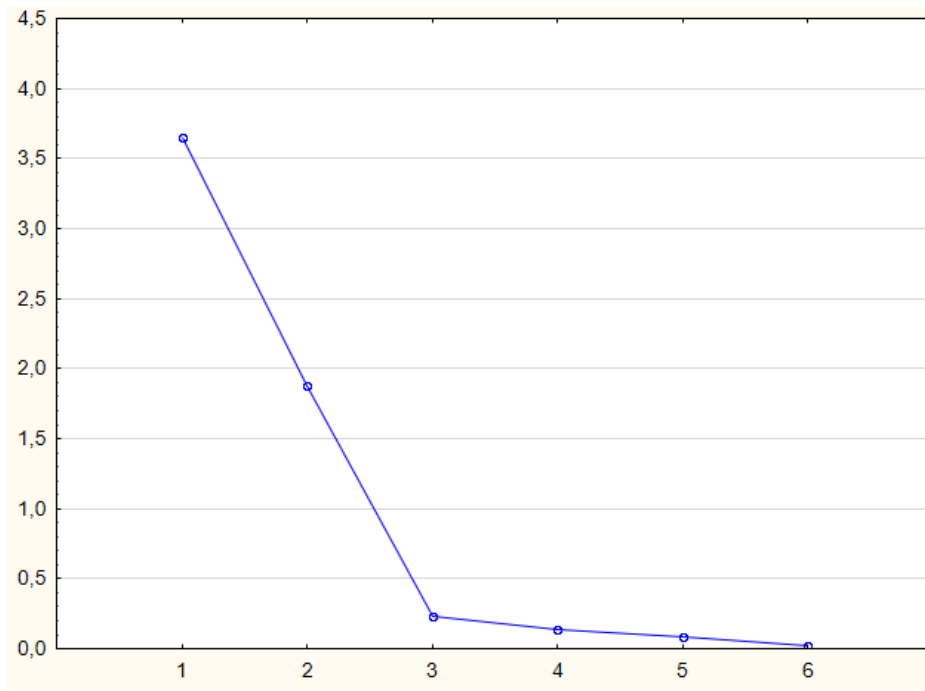| Factor	Eigenvalue	Percentage of total variance	Cumulative eigenvalue	Cumulative variance
Factor 1	3,65	60,80	3,65	60,80
Factor 2	1,88	31,34	5,53	92,15

Figure 1 – Graph of scree plot (author's development)

Table 4 – Factor loadings of insurance market indicators (statistically significant values are marked in gray) (author's development)

Variable	Factor 1	Factor 2
The volume of insurance premiums to the total population, dollars	0,95	-0,14
Life insurance share, %	-0,22	0,94
Ratio of total insurance premiums to GDP, %	0,88	-0,38
The volume of aggregate insurance premiums to the number of employees in the insurance sector, dollars	0,89	-0,28
Accepted reinsurance ratio	-0,74	-0,62
Part of the insurance premiums that are kept on the accounts of insurance companies, %	0,76	0,61

Table 5 – Weighting coefficients (author's development)

Variable	Weight
The volume of insurance premiums to the total population, dollars	0,21
Life insurance share, %	0,05
Ratio of total insurance premiums to GDP, %	0,20
The volume of aggregate insurance premiums to the number of employees in the insurance sector, dollars	0,20
Accepted reinsurance ratio	0,17
Part of the insurance premiums that are kept on the accounts of insurance companies, %	0,17
Sum	1

society to modern challenges of the insurance market has the first indicator – the volume of insurance premiums to the total population (0.21), followed by two indicators with accurate weighting coefficients. The ratio of total insurance premiums to GDP (0,2) and Total insurance premiums to the number of employees in the insurance sector (0,2); the fourth and fifth positions in importance are occupied by the Accepted reinsurance ratio (0,17) and Part of insurance premiums that are kept in the accounts of insurance companies (0,17) and the last place in importance in the structure of the integral indicator of the degree of readiness of society for modern challenges of

insurance The share of life insurance is located on the market (0,05).

The integral indicator will be determined using the following formula (3).

$$I = \sum \overline{y_{ij}} \cdot w_i , \qquad (3)$$

where y_{ij} – average value of the normalized indicator.

As a result of the necessary calculations at the final stage of determining the integral indicator of the degree of readiness of society to modern challenges of the insurance market for OECD countries during 2010–2020, the following results were obtained (Table 6).

Table 6 – An integral indicator of the degree of society's readiness for modern challenges of the insurance market for OECD countries during 2010–2020 (author's development)

Year	The value of the integral indicator
2010	2,95
2011	3,52
2012	3,64
2013	2,88
2014	3,19
2015	2,87
2016	3,44
2017	3,61
2018	4,86
2019	5,15
2020	5,11

The obtained values of the integral indicator are visualized by constructing a histogram. This will make it possible to clearly understand the trends in the insurance market of OECD member countries in the context of assessing the degree of readiness of society to its current challenges (Fig. 2).

As can be seen, the degree of readiness of society for modern challenges of the insurance market in the OECD member countries over the past three years, from 2018 to 2020, shows a positive trend. Compared to 2017, the indicator value has increased by more than 42%. There are years when the weight of the indicator fell to the minimum value for the period under study. In particular, this is typical for 2010, 2013 and 2015.

Thus, the determination of the integral indicator of the degree of readiness of society to modern challenges of the insurance market on the example of OECD member countries during 2010–2020 confirmed the fact that in recent years, society at various levels has shown increased interest in the insurance market, which ensures the relevance of its improvement.

Conclusions and prospects of further research. Therefore, the readiness of society for modern challenges of the insurance market was considered primarily at the theoretical level. The peculiarities of the activity of insurance companies, which were presented by domestic and foreign scientists, were determined. Among the main challenges are the introduction of innovations in the context of constant globalization processes, external and internal economic obstacles to the creation of monetary funds, limited opportunities for the impact of insurance on the social aspects of society and others. This became the basis for the implementation of this research objective.

The readiness of the society to modern challenges of the insurance market was determined by building an integral index based on the following indicators: the ratio of insurance premiums to the total population, the share of life insurance, the ratio of total insurance premiums to GDP, the ratio of total insurance premiums to the number of employees in the insurance sector, the reinsurance ratio and the part of insurance premiums kept on the accounts of insurance companies.

According to the results of factor analysis, the first indicator – the number of insurance premiums to the total population (0.21) has the most significant value in the structure of the integral indicator of the degree of readiness of society to modern challenges of the insurance market.

The following tendency is noted: the higher the value of this indicator, the higher the degree of readiness of society to modern challenges of the insurance market.

According to this index, over the past three years (from 2018 to 2020), there has been a positive trend in the use of insurance services and products in OECD member countries. In 2010, 2013 and 2015, the value of the index decreased to a minimum due to the impact of the global financial crises.

Thus, the calculated index can be a central reference point in the analysis of fluctuations in public sentiment regarding the use of financial products and services.
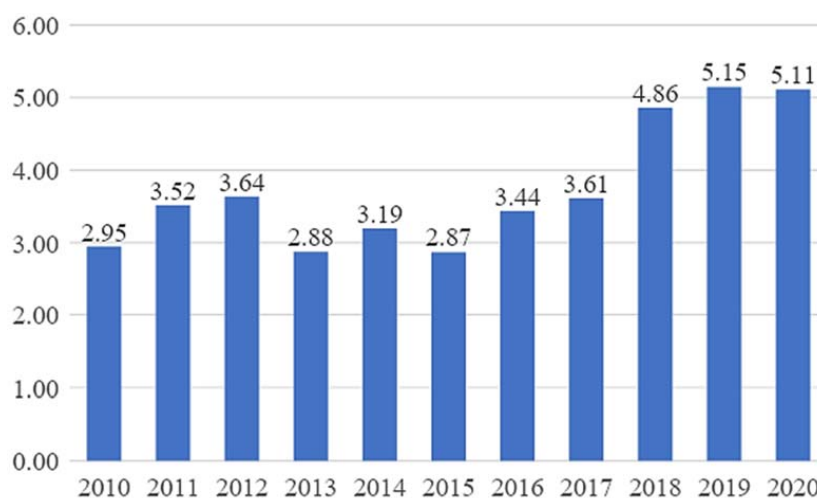

Figure 2 – An integral indicator of the degree of society's readiness for modern challenges of the insurance market for OECD countries during 2010-2020 (author's development)

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ОЦІНКА ГОТОВНОСТІ СУСПІЛЬСТВА ДО СУЧАСНИХ ВИКЛИКІВ СТРАХОВОГО РИНКУ

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У статті узагальнено теоретичні аспекти функціонування страхового ринку. Авторами систематизовано основні підходи до визначення особливостей страхового сектору на основі огляду публікацій іноземних та вітчизняних науковців. Метою дослідження є оцінка готовності суспільства до викликів страхового ринку як одного із провідних елементів фінансової системи. У рамках статті визначено основні тенденції у діяльності страхових компаній. Авторами проаналізовано такі показники: обсяг страхових премій до загальної кількості населення, частка life страхування, відношення загальних страхових внесків до ВВП, обсяг сукупних страхових премій до кількості працівників в страховому секторі, прийнятий коефіцієнт перестрахування та частка страхових премій, які зберігаються на рахунках страхових компаній. Для досягнення мети дослідження авторами використано факторний аналіз, а саме: метод головних компонент, побудовано на основі статистично значущих показників інтегральний індекс ступеня готовності суспільства до сучасних викликів страхового ринку для країн OECD. Готовність суспільства до сучасних викликів страхового ринку визначали шляхом побудови інтегрального індексу на основі таких показників: відношення обсягу страхових премій до загальної чисельності населення, частка страхування життя, співвідношення загальних страхових премій до ВВП, відношення обсягу сукупних страхових премій до кількості зайнятих у страховому секторі, коефіцієнт перестрахування та частини страхових премій, які зберігаються на рахунках страхових компаній. Також були використані методи узагальнення, порівняння, аналізу та синтезу, табличний та графічний інструменти дослідження. Ступінь готовності суспільства до сучасних викликів страхового ринку в країнах-членах ОЕСР протягом останніх трьох років, з 2018 по 2020 роки, демонструє позитивну динаміку. Порівняно з 2017 роком значення показника зросло більш ніж на 42%. Є роки, коли в досліджуваний період вага показника знижувалася до мінімуму. Зокрема, це характерно для 2010, 2013 та 2015 років. Отримані результати факторного аналізу підтвердили статистичну значущість проаналізованих показників страхової діяльності. Це обумовлює постійних моніторинг страхового сектору у частині різних видів пропонованих послуг та продуктів.

Ключові слова: страховий ринок, фінансові відносини, виклики, глобалізація, факторний аналіз, інтегральний індикатор.

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