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ASSESSING THE ACTIVITIES OF INSURANCE COMPANIES DUE TO THE DISEASE OF PRIVATE PENSION[5]

The purpose is to develop a methodological approach and confirm the hypothesis of low risk of the entire market of life insurance companies in Ukraine according to the financial statements to ensure private pensions. Subject – methodological support for risk assessment of insurance companies for life insurance according to the financial statements to ensure private pension. Object – the process of assessing the risk of the activities of insurance companies for life insurance. Research base – the whole market of insurance companies for life insurance of Ukraine, which provide services for non-state pension. The adaptation method of integral risk index (hereinafter – IRI), which allows to divide insurance companies into four zones, was used in the study: catastrophic IRI; critical IRI; acceptable IRI; risk-free IRI. Each zone is determined by the level of compliance of the insurance company's performance indicators with the regulatory limits in Ukraine. A complete list of life insurance companies providing private pension provision in Ukraine was selected as a study. The method is based on a score on T. Saaty's scale, which allows determining the rank of the entities in the insurance market according to their risk. All evaluated life insurance companies in the Ukrainian private pension market reliably build a risk management strategy which allows to assess this market with low risk. In order to have risk-free activity, it is necessary for the companies of allowable risk zone to strengthen some indicators, namely to increase the appropriate level of investment and balance the levels of accounts payable and receivable. The obtained results of establishing the risk levels of all life insurance companies which provide private pension provision through the definition of IRI allow to form an individual risk assessment of the insurance company and develop measures for prevention and counteraction of risks, establish general trends of the insurance market development from the private pension scheme of the country by means of the detailed assessment of particular indicators. The practical effectiveness of the suggested experimental approach is potential and it can be tested in the activities of other insurance companies, while new indicators of changes in the regulation system of the Ukrainian insurance market as to the suggested algorithm will be the basis for determination

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of risk zones which are adapted for the changes. The scientific novelty is to develop a methodological approach to risk assessment of life insurance companies to provide private pensions, which consists in a systematic combination of evaluation stages using the proposed financial indicators, how to measure and integrate them, the formation of the proposed scale risk and its interpretation, which allows for constant monitoring of the level of risk of the entire market of life insurance companies to provide private pensions on the basis of public financial reporting. This approach allowed to assess the risk of all life insurance companies in the market of private Ukrainian pension scheme that proved the low level of risk in this market which is positive for consideration of its development strategies.
Keywords: Integral risk index; life insurance companies; private pension; risk zone; financial services market
JEL: G22; G23

1. Introduction

The current state of the economic system in the world demonstrates the low adaptability of the financial services market to the unexpected and stressful mode of functioning. A change in the regulations and conditions of insurance activity is an additional factor of risk for Ukraine. Nowadays, risk management carried out by the financial market entities requires a better strategy than currently existing in responding to the circumstances of force majeure. The corona crisis significantly weakened the socio-economic situation in Ukraine, which is confirmed by statistical information from the National Bank of Ukraine (hereinafter – the NBU). In 2020 the total profitability of banks' assets decreased from 5.2% at the beginning of the year to 4% at the end. According to the NBU a decrease by more than 1 percentage point resulted from the risks caused by the corona crisis, the beginning of the external debt restructuring procedure, the escalation of the military conflict in the East of the country and other events that affected the financial stress index of the banking industry during the year.

As to the profitability of the Ukrainian banks' capital, the situation is the following: it decreased from 30.75% in the first quarter to 24.40% in the third quarter of 2020. Such decrease is characterized by a sub-optimal structure of revenues, expenditures and capital during 2020. Compared to the first quarter of 2021, the negative trend continues, banks' profits, in general, decreased by another 2.5 times. In modern times, the domestic bank policy, management that maintains the balance between assets and liabilities is not effective and, as a result, there is a decrease in the rate of return on capital.

The pandemic has affected not only the banking industry but also the activity of insurance companies during the quarantine period, which has also significantly suffered. Thus, according to the information of the National Commission for State Regulation of Financial Services Markets (National commission) and the NBU available on the official portal Forinsurer (https://forinsurer.com/stat.), the profit of the insurance companies decreased by a total of 516 million hryvnia for the first half of 2020, which indicates negative market trends, low insurance reserves and the presence of the ineffective measures for prevention of risks (stress). Under such conditions of the financial services market, the assessment of risk and its prevention is a priority that requires reasonable decisions. According to the authors, the implementation of a risk-oriented approach to the management of financial institutions may be forward-looking in terms of loss prevention.

While considering in detail the concept of risk-based approach taking into consideration the existing definition in the Ukrainian legislation as well as its essential content – generally, it is a process that includes the identification, assessment and understanding of risk. Namely, the process of implementing the approach under current conditions of the financial services market is in the plane of analysis of the conditions of risk and its assessment. As to the financial services market entities – each entity has common and individual risks. Special attention has to be paid to the insurance companies because their activities are based on the client's risk that may arise with a certain probability (as of 2020 196 institutions where only 19 insurance companies provide life insurance services while all others carry out services in the risk area (Official site of the National Bank of Ukraine)). Insurance is the only financial service, the result of which is directly dependent on the occurrence of the risk, and, therefore, the economic results of the market entity of the financial institutions that provide financial services are directly proportional to it.

In the current conditions of the insurance companies' functioning the financial service of pension provided by the life insurance companies is becoming increasingly important (as of January 1st, 2021, there are 19 aforesaid companies in Ukraine). Thus, the amount of pension payments of these financial institutions for 9 months of 2020 amounted to 51.8 million hryvnia, which is 5 million hryvnia (or 10.7%) higher as for the corresponding previous period (for 9 months of 2019 – 46.8 million hryvnia) (https://forinsurer.com/stat.). That is, despite the small number of life insurance companies, the latter show a positive growth rate in the accumulated financial resources during 2020. Such trends lie in the clients' need for pension security and independence.

Thus, the relevance of risk assessment of financial services market entities, in particular, life insurance companies, is beyond doubt due to the fact that the prospect of determining the real financial state using a risk-oriented approach and the ability to quick reaction to the risks arising in today's fast-paced economic conditions, namely, in the pension market, is a substantial and necessary condition for the functioning of the financial market entities.

2. Literature Overview

Many scientists studied the issue of insurance, namely: Roedel K. T., Graf S., Kling A., who consider the solvency of life insurance companies through the prism of modeling interest rate guarantees in order to determine long-term prospects for assessing their own risks (Roedel, Graf, Kling, 2021); Budska P., Fleischmann L., who considered the competitive advantages of the Czech insurance sector using the Herfindahl-Hirschman index in the long run (Budska, Fleischmann, 2021); Biagini F., Huber T., Jaspersen Johannes G., Mazzon A., studying the German life insurance market under different scenarios of further market development (Biagini, Huber, Jaspersen Johannes, Mazzon, 2021); Osei-Bonsu A., Abotsi Anselm K., Carsamer E., who considered the causal relationship between insurance and economic growth due to the impact of innovation in the insurance industry (Osei-Bonsu, Abotsi Anselm, Carsamer, 2021); Wang H., Zhang D., Guariglia A., Fan G.-Z., who studied the demand for life insurance in China and concluded that it is necessary to increase the level of financial literacy of the population in order to increase the percentage of life insurance services in the

country (Wang, Zhang, Guariglia, Fan, 2021); Bazylevych V. D., who studied the theoretical foundations of insurance with taking into account the processes of risk management in it and the basics of pension through supplementary pension insurance (Bazylevych, 2008); Demyanyshyn V. G., who considered insurance services as possible objects of fraud (Demyanyshyn, Klapkiv, 2020, p. 66); Osadets S. S. and Murashko O. V., Furman V. M., Baranov A. L., Baranova O. V., Zaletov O. M., Nechiporenko V. I., considered the financial aspects of managing the processes of creation and effective use of the insurance organizations' potential – insurance management (Osadets, Murashko, Furman, Baranov, Baranova, Zaletov, Nechiporenko, 2011, p. 333; Osadets, Murashko, Furman, Baranov, Baranova, Zaletov, Nechiporenko, 2008).

Francisco Ceballos and Miguel Robles analyzed highly specialized problems of insurance risk, covering the impact of weather indices on the formation of risk which is the basis for the insurance service (Ceballos, Robles, 2020), Heinrich T., Sabuco J., Farmer J. D., studying the problems of risk homogeneity in the process of modeling the insurance industry, which is expressed in the simulation of profits and losses of financial institutions (Heinrich, Sabuco, Farmer, 2021); Ettlin N., Farkas W., Kull A., Smirnow A., who studied the process of risk transfer for insurance companies in order to optimize their profitability (the author explains the process of finding a unique solution through the theory of cooperative games) (Ettlin, Farkas, Kull, Smirnow, 2020, pp. 39-47); Dankiewicz R., Simionescu M. investigated the prospects of insurance by macroeconomic and microeconomic indicators and established a linear relationship between reimbursement and gross income of written-off premiums (Dankiewicz, Simionescu, 2020, pp. 248-261). Li X ., Liu H., Tang Q., Zhu J. investigated the liquidation risk in the field of insurance, conducted a probabilistic analysis for the rehabilitation of an insurance company that has reached a low barrier to the value of its assets (Li, Liu, Tang, Zhu, 2020, pp. 36-49). Curak M., Kovac D. managed the insurance company's risks through the use of securitization, focusing on property insurance that is not related to pensions or the health of customers (Curak, Kovac, 2020, pp. 287-302). Scientists from Italy and Great Britain Bakinello A.-R., Biffis E., Millosovych P. in their researches consider the impact of the death risk in life insurance on the pricing the contract (Bakinello, Biffis, Millosovych, 2009, p. 27). They substantiate their own researches with corresponding models developed by them in order to determine the algorithm for estimating the value of the life insurance contract. Similar modelling methods were used by the following scientists: Mahboubeh Shadabfar, Longsheng Cheng, who developed a probabilistic approach of the formation an optimal portfolio in the capital market (Mahboubeh Shadabfar, Longsheng Cheng, 2020, p. 3381). NeleVandaele and Michèle Vanmaele studied the deeper aspects of risk formation and its development in view of the impact of time, in their studies, they provide appropriate hedging models that minimize the risk of life insurance companies' activity (NeleVandaele, Michèle Vanmaele, 2009, p. 16). Lai G., Nakamura H., Yamamoto S., Yoneyama T. examined mortality rates in detail and correlated them with the balance of losses in the context of term life insurance (Lai, Nakamura, Yamamoto, Yoneyama, 2021). The researches of the said scientists are full of mathematical calculations and they aim to establish the dependence of risk and its price formation, but the issues of risk assessment for the insurance activity are not covered in these works.

In addition, the authors broadly demonstrate the feasibility of using a risk-oriented approach to solve problems of assessing the activity of insurance companies (Vnukova, Kavun,

Kolodiziev, Achkasova, Hontar, 2020, p. 151). Other scientists consider the general aspects of life insurance under pension reform (Pikus, Khemii, 2018, pp. 223-232), the problems of private pension scheme in view of the insurance companies' services (Achkasova, 2020). Bottan N., Hoffmann B., Vera-Cossio Diego A. study the issue of pensions during the systemic crisis, including pandemics and have a corresponding positive effect from participation in the state program, even without contributions, which provides social protection to clients in the form of remittances and unemployment insurance (Bottan, Hoffmann, Vera-Cossio, 2021). Belkina T.A., Konyukhova N.B., Slavko BV dealt more deeply with the issues of risk strategies of pension insurance, namely the singular problems of integrated-differential equations, which are compared according to traditional solvency criteria, which are taken into account when calculating probabilistic models of investment companies (Belkina, Konyukhova, Slavko, 2020, pp. 1621-1641).

Life insurance has become even more popular in the world under modern quarantine conditions, which is why scientists such as Liedtke P.M. dedicate their work, emphasizing the need to attract private investment to the insurance sector, which will balance the safety of insurers and market efficiency (Liedtke, 2021); Farooq U., Nasir A., Bilal, Quddoos M. Umer, who have accumulated a huge number of insurance companies around the world to study the effects of the coronary crisis on the value of shares in the market (Farooq, Nasir, Bilal, Quddoos Umer, 2021). Bhatia R., Bhat Anil K., Tikoria J., who presented a systematic review of the behaviour of consumers of life insurance products, which allowed to identify gaps in the field in various scenarios of future development, including COVID-19 (Bhatia, Bhat Anil, Tikoria, 2021). By the way, the efficiency of insurance companies worries scientists from different countries. Thus, the study of technical efficiency of insurance in the Vyshgrad group was carried out by Preckova L., Paleckova I., who established a certain trend over time in the development of the industry, which explained the volume of written-off premiums and net income, high costs (Preckova, Paleckova, 2020, pp. 862-880). Life insurance in India is taken care of by the scientist Siddiqui S., who emphasizes the full efficiency of the entire sector in the country in the presence of technologies and methods of capital regulation (Siddiqui, 2020, p. 72-80).

Meanwhile, the peculiarities of pension scheme provided by life insurance companies remain insufficiently studied in the world and require a deeper risk analysis, especially in the context of a risk-oriented approach to its management (P1).
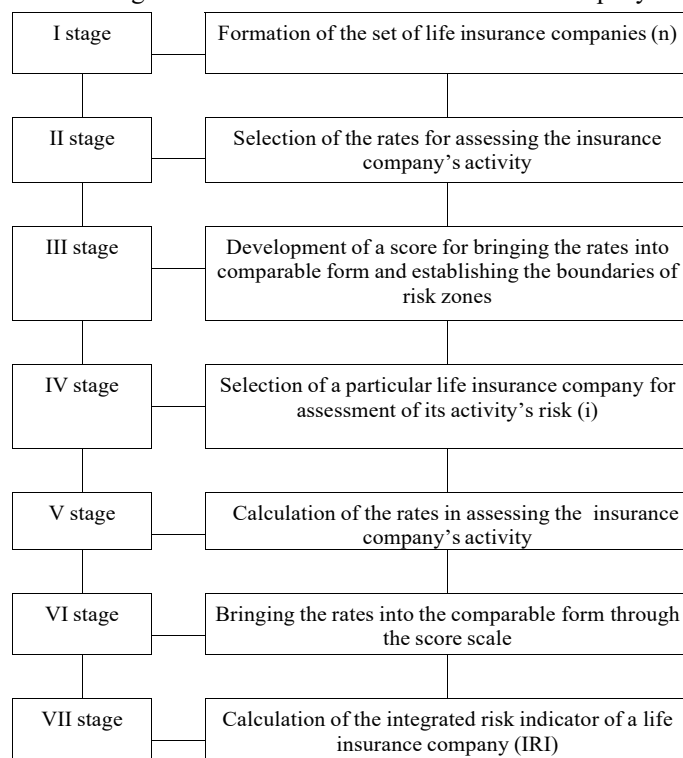

3. Methodology

It is suggested that a risk assessment of life insurance companies should be carried out by the method of integrated risk indicator (hereinafter – IRI), which was developed by Smolyak V. A. in order to determine the financial and economic condition of the enterprises (Smolyak, 2005). In order to be more effective, the method was adapted by the authors to the activity of life insurance companies that provide financial services for a private pension.

The adapted algorithm for the application of the IRI method is given in Figure 1.

Figure 1

Stages of the integrated risk indicator of a life insurance company's activity

I stage	Formation of the set of life insurance companies (n)
II stage	Selection of the rates for assessing the insurance company's activity
III stage	Development of a score for bringing the rates into comparable form and establishing the boundaries of risk zones
IV stage	Selection of a particular life insurance company for assessment of its activity's risk (i)
V stage	Calculation of the rates in assessing the insurance company's activity
VI stage	Bringing the rates into the comparable form through the score scale
VII stage	Calculation of the integrated risk indicator of a life insurance company (IRI)

Source: adapted from Smoliak, 2005.

As shown in Figure 1, the IRI method is voluminous and full of some calculations, which begin with the definition of the studied set of insurance companies. The formation of a set of life insurance companies is a stage that requires special attention, as the adequacy and validity of the results obtained depend on the selected population.

Stage II is the selection of coefficients to assess the performance of objects formed in the previous stage. This stage is subjective due to the range of existing methods and the need to choose between them, but regardless of the selected indicators, the evaluation process includes, under any circumstances, the main activities of the insurance company, which allows to reach an objective conclusion about the real state of the financial institution.

Regarding stage III – the indicators selected at stage II have certain normative values, which should be carefully presented as a cumulative result. An effective means for this is a score on a scale that takes into account all the options for the error of the coefficients, thereby standardizing them. The next two stages are the direct calculation of the selected performance ratios on the example of one (any) insurance company. Most often, the calculation is based on officially presented statistical information that is made public.

The penultimate stage includes the process of applying a pre-designed score scale to the calculated indicators in stage V. The last stage is final and presents the result of all these stages in the form of an integrated indicator that compiles the calculations and clearly demonstrates the risk area of the insurance company.

4. Empirical Results

For further calculations, it is suggested to take into consideration the particular list of life insurance companies that provide financial services for pension. In total, there are 19 life insurance companies in Ukraine, among which only 10 financial institutions have pension programs. It's worth noting that none of the 19 insurance companies is listed in the Register of Financial Institutions (Official site of the National Bank of Ukraine) for the implementation of their pension programs and the only way of their detection is an individual search. The full list of the Ukrainian life insurance companies that provide financial services for pension and act as a general totality for further research (n) is represented in Table 1.

Table 1

General research (n) by the IRI method

List of life insurance companies in Ukraine	Availability of a pension program	Life insurance companies which provide pension scheme and act as a sample for the study
MetLife	+	MetLife
TAS (Life)	+	TAS (Life)
PZU Ukraine Life	+	PZU Ukraine Life
ASKA-life	+	ASKA-life
Kniazha Life	+	Kniazha Life
INGO Life	+	INGO Life
KD-Life	+	KD-Life
GRAVE Ukraine Life	+	GRAVE Ukraine Life
Forte Life	+	Forte Life
Swiss Classic Life	+	Swiss Classic Life
UNIQALife	-	-
ARX Life	-	-
Greenwood Life Insurance	-	-
Arsenal Life	-	-
Oranta Life	-	-
Megagarant Life	-	-
Sun Life	-	-
Classic Life	-	-
Class Life	-	-
19 life insurance companies	10/19*100 % = 52 %	10 life insurance companies (n) which have pension programs

Source: compiled by the author.

As shown in Table 1, 52% of life insurance companies decided to provide insurance with a pension as a financial service.

The second stage of determining the IRI is to select the rates for assessment of life insurance companies' activity that provide pension. The indicators of assessment of the insurance

company's stress resistance suggested by A. Yermoshenko (2016, pp. 369-377) were chosen due to the fact that their calculation is based on the process of risk prevention. Chosen indicators (p) are divided into the following groups (m):

1. Liquidity indicators of the insurance company (quick, critical and complex liquidity rate).

2. Indicators of the analysis of receivables and payables of the insurance company (rates of dependence on receivables and payables, the level of receivables for the payment of insurance premium).

3. Indicators of dependence on reinsurers (participation of reinsurers in the insurance premium, in occurred losses, an indicator of participation of reinsurers in insurance reserves).

4. Indicators for assessing insurance liabilities (ratio of insurance reserves and net premiums, deficit (surplus) of insurance reserves).

5. Indicators of solvency (actual and statutory solvency reserve (the largest of the values), the current solvency rate).

6. Indicators of assessment of own funds of insurance companies (level of coverage of liabilities by own funds, level of coverage of insurance reserves by own funds).

The third stage of determining the IRI is to develop a scale which allows to bring the nominal values of the said rates into comparable form, the development of which is based on the requirements for constructing an interval scale suggested by T. Saati (Lyamets, Uspalenko, 2015, p. 100) taking into account the psychophysiological differences of the subjects during the assessment. The obtained scale is represented in Table 2.

As shown in Table 2, the interval assessment of score value (1; 9) was used in bringing the nominal values of the rates into the scores (BZ), so the further gradation of risk zones for sharing the integral index (IRI) is established by dividing this interval into four zones: catastrophic IRI (0; 2.25]; critical IRI [2.25; 4.5]; acceptable IRI [4.5; 6.75]; risk-free IRI (6.75; 9].

A catastrophic risk zone indicates non-compliance with the standards of solvency, liquidity, profitability, which as a result calls into question the activities of the insurance company, in general. The risk-free zone, on the other hand, provides a high level of performance, which reflects the security of the financial service client. The critical zone characterizes the limit of indicators that do not partially meet the standards, and thus pose a risk to the client. The eligible zone is comfortable for both the client and the insurance company, because the performance indicators are within the standards, but there are no certain stocks of indicators that do not allow them to move to a risk-free zone.

The next two stages (see Figure 1) include the calculation of the chosen indicators, for example, one life insurance company that provides pension services. According to the authors, the obtained rate should be immediately converted into scores (the 6th stage of the algorithm, shown in Figure 1).

Table 2

Score scale of bringing the nominal values of the chosen rates of assessment of insurance
companies' activity into a comparable form

Score	Correspondence of the nominal value of rate to the statutory one*:		Direction of change of rate in dynamics	Explanation
	Reporting period	Previous period		A particular score is assigned to the rate if its nominal value…
1	–	–	Negative	… does not correspond to the statutory and has deteriorated during the reporting period in comparison with the previous one.
2	–	–	Without change	… does not correspond to the statutory and is not changed during the reporting period in comparison with the previous one.
3	–	–	Positive	… does not correspond to the statutory and there is a tendency of improvement during the reporting period in comparison with the previous one.
4	–	+	Not considered	… does not correspond to the statutory but it is within range in the previous period.
5	+	–	Not considered	… corresponds to the statutory in the reporting period but it is beyond it in the previous one.
6	+	+	Without change	… corresponds to the limit value of the statutory both in the reporting period and in the previous one.
7	+	+	Negative	… corresponds to the statutory and there is a tendency of deterioration during the reporting period in comparison with the previous one.
8	+	+	Without change	… corresponds to the statutory and is not changed during the reporting period in comparison with the previous one.
9	+	+	Positive	… corresponds to the statutory and has improved during the reporting period in comparison with the previous one.

* – «+» – correspond; «–» – not correspond.
Developed by the authors on the basis of interval scale of T. Saati (Lyamets V. I., Uspalenko V. I., 2015, p. 100)

METLIFE insurance company was chosen for the calculations due to the fact that it is currently the leader in the rank of life insurance companies (https://forinsurer.com/stat.) and has pension insurance programs. The results of the calculations of the indicators made on the basis of the official financial statements of the company (Official site of the METLIFE insurance company) are given in Table 3.

The last stage of the study is the calculation of the integrated risk indicator (IRI) of the life insurance company. There are a huge number of ways to determine the integrated risk indicator. The main difference between all methods is the risk that needs to be assessed, and hence the indicators that underlie its calculation. Thus, the scientist Shamileva L.L. (2008, pp. 166-176), determines the integrated indicator of social risk, based on the use of the arithmetic mean of the normalized indicators that assess this risk. Scientist Trunova O.V. (2009, pp. 217-227) determines the integrated indicator of production systems by calculating the weighted average risk, which includes the specific gravity of the indicator and the coefficient of risk. And scientists Pokataeva O.V. and Slavina M.A. (2019, pp. 157-161) carry out the calculation of the integrated risk indicator of the banking sector through the normalization of the system of indicators by the method of variation and synthesis of their

values according to the multiplicative model. All these methods of determining the integrated risk indicator are correct and logically justified within the tasks they solve in the individual study, but none of them meets the need to determine the risk of the insurance company given the available score of the risk area. Therefore, it is proposed to determine the integrated risk indicator of the life insurance company according to the formula proposed by Smolyak V.A. (2005), which takes into account the necessary features of the zoning process:

Table 3

The calculation results of the indicators for IRI determination (on the example of SC METLIFE)

Indicator	Period		Score of the indicator (table 2)
	2018	2019	
Indicators of the insurance company's liquidity (g1)			
Index of quick liquidity, %	213, 0	110, 0	9
Index of critical liquidity, %	51,8	31,4	3
Index of complex liquidity, %	13,9	15,7	3
Indicators of the analysis of the receivables and payables of the insurance company (g2)			
Index of the dependence on the receivables, %	1,82	1,57	3
Index of the dependence on the payables, %	5,9	5,3	3
Index of receivables for payment of insurance premiums, %	4,98	4,42	3
Indicators of the dependence on reinsurance (g3)			
Reinsurers' participation in the insurance premium, %	1,47	1,34	9
Reinsurers' participation in the occurred losses	0	0	9
Indicator of the reinsurers' participation in the reserves, %	0,03	0,05	7
Indicators for assessment of the insurance liabilities (g4)			
Ratio between insurance reserves and net-premiums, %	53,6	51,7	9
Deficit (surplus) of the insurance reserves, thousand of hryvnia	5 809 7,71		9
Indicator of the insurance company solvency (g5)			
Actual (net-activated) plateau capacity, thousand of UAH	352525	332213	9
Current solvency ratio, %	74,3	76,01	9
Indicators of valuation of the insurance company's own funds (g6)			
Level of coverage of liabilities with own funds,%	12,0	14,5	1
The level of coverage of insurance reserves with own funds,%	12,97	1,5	3

Source: compiled by the author.

$$IRI = \frac{\sum_{m=1}^{g} \frac{\sum_{p=1}^{k} S_{pm}}{k}}{g},$$ (1)

where:

S_{pm} is a score of the p rate within m group;

k – number of rates in the group of indicators;

g – number of groups of the indicators.

As shown in formula (1), for IRI calculation, it is necessary to find the arithmetic mean of the obtained scores for each group and then evaluate the insurance company's activity according to all 6 groups of indicators. The calculation is a simple arithmetic operation that does not require any supplements or visual clarity. Therefore, the obtained IRI of the life insurance company METLIFE was 6.05, which corresponds to the allowable risk zone of the developed scale at stage 3.

This algorithm underlines the effective implementation of a risk-oriented approach in the practice of insurance company METLIFE, implementation of a well-grounded risk prevention policy and availability of appropriate management, which allows being within the corresponding scope of allowable risk. It should also be noted that under today's economic conditions, it is almost impossible to manage the risk-free activity, that is why a financial institution in the zone of acceptable risk is a positive trend in the development of financial services, in particular, pensions.

In accordance with the suggested algorithm for IRI calculation, a similar assessment was made for the activities of all life insurance companies included in the analytical group (general set). The results of the calculations are represented in Table 4.

Table 4

Results of risk assessment of life insurance companies which provide pension services
(general set)

A set of life insurance companies that provide pensions and act as a sample for the study	Score of the rate (Table 2)	Risk zone
TAS (Life)	5.67	Allowable
PZU Ukraine Life	5.67	Allowable
ASKA-life	6.89	Risk-free
Kniazha Life	7.72	Risk-free
INGO Life	5.39	Allowable
KD-Life	7.89	Risk-free
GRAVE Ukraine Life	7.56	Risk-free
Forte Life	8.56	Risk-free
Swiss Classic Life	7.89	Risk-free

Source: compiled by the author.

As shown in Table 4, six insurance companies have a high score and are under the risk-free zone, three insurance companies are under the allowable risk zone. Taking into account the results of the risk assessment of Metlife's activity the private pension insurance market has low risk or almost risk-free activity, which creates positive preconditions for its development.

Risk is a broad concept that characterizes not only the negative impact on the activities of the insurance company, but also determines the level of protection of the client, who is, for example, a user of insurance services under the pension program. That is, with the available information on the risk areas of insurance companies, you can quickly assess not only the state of their development, but also the ability to meet obligations to the client. Yes, an insurance company in a risk-free zone is potentially more attractive to a customer than an insurance company in a critical zone. The demand of the insurance company can be estimated by the ratio of insurance payments (reimbursement) to the attracted insurance premiums, which are considered a payment for the risk of the insurance company (Table 5).
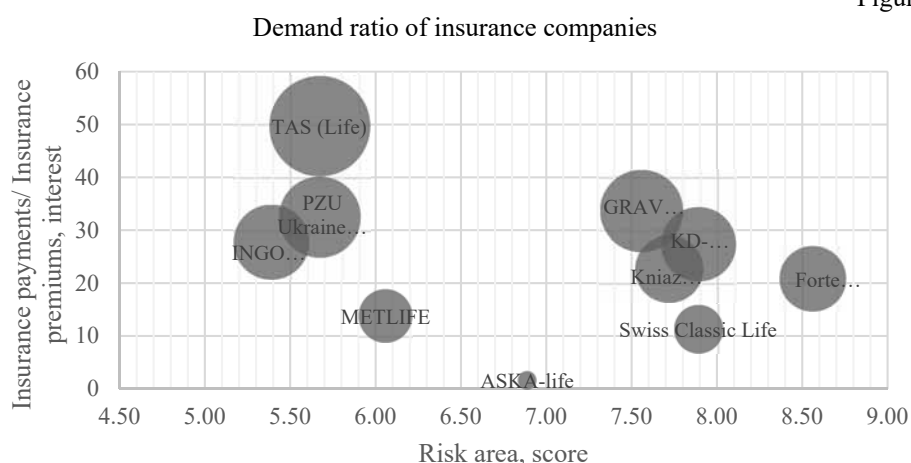
Table 5

Demand ratio of life insurance companies providing pension services in Ukraine

A set of life insurance companies that provide pensions and act as a sample for the study	Insurance payments / Insurance premiums, interest
TAS (Life)	49,7
PZU Ukraine Life	32,6
ASKA-life	1,6
Kniazha Life	22,7
INGO Life	27,9
KD-Life	27,4
GRAVE Ukraine Life	33,7
Forte Life	20,8
Swiss Classic Life	11,3
METLIFE	13,8

Source: compiled by the author.

As can be seen from Table 5, the ratings of insurance (https://forinsurer.com/stat.) for life insurance, built on the volume of insurance premiums, do not coincide with the demand for insurance services, which expresses the received demand indicator. Thus, the insurance company METLIFE due to the uneven distribution between insurance payments and premiums towards the small amount of insurance payments, is only the eighth out of ten place among insurers in the market. In turn, insurance companies such as TAS (Life) and PSU Ukraine Life have a high level of the ratio of insurance premiums and insurance payments, which justifies the trust of customers and their position in the ranking (https://forinsurer.com/stat.). This is due to the policy of the life insurance company on the procedure for payment of compensation to clients, the availability of an extensive list of financial services provided by TAS (Life) and PSU Ukraine Life, including the availability of pension programs. More clearly, the position of each insurance company on the results of the calculated demand can be seen in Figure 2.

Figure 2

Demand ratio of insurance companies

Source: compiled by the author.

As can be seen from Figure 2, all life insurance companies are in an acceptable or risk-free zone – this is due to the inability of such companies to operate in other conditions through the financial service they provide, then they cause customer confidence. The chart shows that the best for cooperation between insurance payments and insurance premiums is GRAVE Ukraine Life, which is in a risk-free zone. That is, this insurance company can be the optimal choice for the client for protection. In turn, the market leader in insurance services insurance company METLIFE, has a low level of extended display of customer protection due to the low share of payments to your customers and a high amount of insurance premiums, which are not reflected in meeting the needs of policyholders. Although, without a conditional, large number of people involved, the insured's trust in the insurance company and large-scale customer base should be reported. The amount of insurance premiums not only reflects the funds earned by the insurance company under the contracts, but also indicates a certain scale of the customer base. In turn, the amount of insurance payments indicates the feedback of the insurance company with the client, namely the amount of compensation by the insured in the event of an insured event. The ratio of these two indicators can be interpreted as the amount of the insurance company's obligations to customers. The higher this relative indicator, the more payments made by the life insurance company, in turn, significantly inflated compared to the reimbursement of insurance premiums, characterizes the presence of a large number of customers, among whom insurance payments are received by units. Such a situation should not inspire confidence on the part of clients in the insurance company, which defends its own interests much more intensively, than the client's desire to eliminate the risk.

Thus, it can be concluded that all companies in the market of insurance services that provide pension services reliably build a risk management strategy that allows them to maintain an effective level of their activity by means of compliance with the regulations. However, those insurance companies under the acceptable risk zone need to strengthen their rates in order to gain a more comfortable risk zone.

The existing problems of insurance companies that provide financial services for life insurance caused by the current risks of the insurance market need to be settled.

Forenshurer (https://forinsurer.com/stat) published the TOP 10 risks faced by the life insurance companies in their activity. These risks include: technology, profitability of investment, management, cyber risk, change management, rates of interest, macroeconomics, competition, human talent and business practices. In the example of IC METLIFE by comparing the results of the risk assessment of the life insurance company providing a pension service and this list of risks, we can determine the following conclusions.

First of all, the inappropriate level of investment influences the complex liquidity index, which needs to be improved in this insurance company (Table 3); secondly, the discrepancy between the levels of accounts payable and receivable demonstrates the problems of change regulation and management that need to be implemented into this insurance company. The solving of its problems is logically possible by means of reaching a balance between investment assets, receivables and payables.

The calculation process according to the suggested algorithm is logically balanced but requires some time expenditures. Meanwhile, the result of determining the risk level of a life insurance company providing pension services through the definition of IRI allows to form

an individual risk assessment of the insurance company and develop measures in prevention and counteraction of risks and establishing general trends in the market of private pension services through a detailed assessment of individual indicators.

The proposed experimental approach of risk management and gaining a risk-free zone for life insurance companies is acceptable for insurance companies that provide private pension services and if they are under an acceptable or risk-free zone. It allows to determine of any level of risk, but those financial institutions that are in critical or catastrophic risk zone will have a different balance structure which will require more significant influence of management and implementation of other risk-based measures.

The article gives an example of the application of the results of the presented approach to determine the level of client protection, which allows on the basis of insurance payments and insurance premiums to make a choice towards an insurance company that conducts balanced activities to ensure timely payments within the permissible risk zone. That is, the obtained risk areas allow to build of a system of development of life insurance companies that provide pension services, in general, and a "map" of choice for policyholders, in particular.

Further research should profoundly analyze the scope of activity of each individual insurance company, the amount of funds raised from life insurance in the private pension market in accordance with a certain risk zone. Also, in order to assess the level of risk of the insurance company and identify possible trends of change from one risk zone to another, it is advisable to support the study with similar calculations in the dynamics.

5. Concluding Remarks

A review of the specialized literature and analysis of the research results on the determination of the risk zones of life insurance companies providing pension services confirmed the position (P1) on the relationship between a determined level of risk of the insurance company and the possibility of managerial influence on its behaviour by means of the established indicators in order to strengthen the policy of prevention and counteraction of risks by applying some managerial decisions. The possibility of determining general recommendations in order to strengthen the risk management policy is contingent on the full coverage of all subjects of the life insurance market for private pension scheme based on the financial statements which were used in conducting the study. The practical effectiveness of the suggested method is potential and it can be tested in the activities of other insurance companies while determined risk zones may be adapted to new indicators that will correspond to the changes in the regulation system of the Ukrainian insurance market.

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