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***Shevchuk O.***
*Ph. D. in Economics, Associate Professor of Department of Finance,*
*Lviv Polytechnic National University, Ukraine;*
*e-mail: Oleksandra.O.Shevchuk@lpnu.ua; ORCID ID: 0000-0002-2886-6311*
***Yaroshevych N.***
*Ph. D. in Economics, Associate Professor of Department of Finance,*
*Lviv Polytechnic National University, Ukraine;*
*e-mail: Nataliia.b.yaroshevych@lpnu.ua; ORCID ID: 0000-0003-3836-067X*
***Yevtukh L.***
*Ph. D. in Economics, Associate Professor of Department of Financial Consulting and Banking,*
*Banking University, Lviv, Ukraine;*
*e-mail: luba_yev@ukr.net; ORCID ID: 0000-0002-1644-4533*

## INTRODUCING A LIFE ASSURANCE GUARANTEE SCHEME IN UKRAINE: FUNDING MECHANISM AND RISK-BASED ADJUSTMENT

**Abstract.** Life insurance, as well as bank deposits, is a form of household savings, so contributions under life insurance contracts must be properly guaranteed by creating compensation mechanism. The paper deals with a number of issues in relation to the solutions for Ukrainian life insurance guarantee scheme (IGS). The main purpose of this study is to introduce decision on scheme design and appropriate fund-raising mechanism for Ukrainian IGS providing the last resort protection to customers who make their savings via life assurance contracts.

Highlighting positive and negative effects of IGS implementation, analysing sources of funding for guarantee schemes, the research substantiates economic effects of risk-based approach to assessing contribution and proposes general scheme of estimating the insurer's contribution to the IGS fund, in particular indicators for risk-based adjustment of IGS levies and adjustment procedures.

Based on methods for calculating contributions to European deposit guarantee schemes, the article specifies technically sound methods for calculating contributions to IGS fund which capture various aspects of the insurers' risk profile including capital adequacy, asset quality, liquidity and funding, profitability profile, business management, as well as the potential loss for the IGS and market circumstances.

The methodology, proposed in the paper, is relevant not only for Ukraine, where the introduction of the IGS scheme for life assurance is only in perspective, but also for all other countries with existing IGS to implement risk-weighted approach to scheme setting that prompts insurers to control their risks, provides more effective and healthy competition.

***Keywords*:** life assurance, insurance guarantee scheme, policyholder protection, funding mechanism, risk-weighted contribution.

**JEL Classification** G22, G33

Formulas: 5; fig.: 4; tabl.: 1; bibl.: 13.

***Шевчук О. О.***
*кандидат економічних наук, доцент, доцент кафедри фінансів,*
*Національний університет «Львівська політехніка», Україна;*
*e-mail: Oleksandra.O.Shevchuk@lpnu.ua; ORCID ID: 0000-0002-2886-6311*
***Ярошевич Н. Б.***
*кандидат економічних наук, доцент, доцент кафедри фінансів,*
*Національний університет «Львівська політехніка», Україна;*
*e-mail: Nataliia.b.yaroshevych@lpnu.ua; ORCID ID: 0000-0003-3836-067X*



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***Євтух Л. Б.***
*кандидат економічних наук, доцент,*
*доцент кафедри фінансового консалтингу та банківництва,*
*Університет банківської справи, Львів, Україна;*
*e-mail: luba_yev@ukr.net; ORCID ID: 0000-0002-1644-4533*

# УПРОВАДЖЕННЯ СИСТЕМИ ГАРАНТУВАННЯ ВИПЛАТ ЗА ДОГОВОРАМИ СТРАХУВАННЯ ЖИТТЯ В УКРАЇНІ: МЕХАНІЗМ ФІНАНСУВАННЯ НА ОСНОВІ ОЦІНКИ РИЗИКУ

**Анотація.** Страхування життя, як і банківські депозити, є формою заощаджень домогосподарств, тому виплати за договорами страхування життя повинні бути належним чином гарантовані шляхом створення компенсаційного механізму. Запропоновано рішення для української системи гарантування виплат (СГВ) за договорами страхування життя, зокрема загальна схема і відповідний механізм формування фонду із внесків страховиків — учасників СГВ, що розглядається як останній рівень захисту для громадян, які здійснюють свої заощадження шляхом укладення договорів страхування життя.

На основі виділення можливих позитивних і негативних наслідків від упровадження СГВ, аналізу джерел фінансування гарантійних схем у дослідженні обґрунтовано економічний ефект від застосування підходу до визначення гарантійних внесків на основі оцінки ризиковості діяльності страховиків — учасників системи і запропоновано алгоритм розрахунку ризик-зваженого внеску страховика у фонд СГВ, зокрема наведено індикатори ризику і процедури коригування внесків.

Узявши за основу методологію розрахунку внесків до європейських схем гарантування депозитів, дослідження розвиває метод оцінки внесків до фонду СГВ за договорами страхування життя, який ураховує різні аспекти профілю ризику страховиків, включаючи достатність капіталу, якість активів, ліквідність, прибутковість, модель управління, а також потенційні збитки для СГВ і ринкові фактори.

Запропонована методологія актуальна не лише для України, де запровадження системи гарантування виплат за договорами страхування життя лише у проєкті, а й для інших країн з чинними СГВ для впровадження ризик-зваженого підходу до формування фонду з внесків учасників, що спонукає страховиків до контролю ризиків, забезпечує більш ефективну і здорову конкуренцію.

***Ключові слова*:** страхування життя, система страхових гарантій, захист страхувальника, механізм фінансування, ризик-зважений внесок.

Формул: 5; рис.: 4; табл.: 1; бібл.: 13.

**Introduction.** Life insurance, as a type of personal insurance, has a long-term nature, a significant savings component and aims at providing social protection for the population. Financial services consumers in Ukraine usually do not have sufficient information and necessary knowledge about the features of financial services. When choosing a service, they may not always be able to assess the level of risk, potential consequences and compare the terms of service offered by different financial institutions.

Under the circumstances, it is crucial important to ensure a high level of consumer protection through new effective approaches to regulating and supervising the insurance companies' activities and establishing an insurance guarantee scheme (IGS) for life assurance contracts in Ukraine, which will prevent the loss of citizens' savings and insurance benefits in case of insurer's insolvency.

The implementation of a second level of pension system in Ukraine (with the involvement of insurers in it) seems not reasonable without providing guarantees for the investment return. Customers should clearly understand that in case of financial problems occurring with the insurer, they will receive their long-term savings back.

This outlines the need for research the feasibility of creating compensation and guarantee mechanism for life insurance premiums in Ukraine, its design and introduction, as well as the clarification of the financial basis of such mechanisms.

**Analysis of recent research and publications.** Policyholder protection schemes are actively investigated by foreign scientists. OECD (2013) examines the rationale for a policyholder protection scheme, the relationship between certain design features and moral hazard [1]. Oxera (2007) and EIOPA (2018) presented a comprehensive description of existing insurance guarantee schemes in EU member states, their design features, guarantee costs and sources of funding [2; 3]. European commission report (2010) proposes the methodology for «estimation of loss distributions for IGSs based on a default risk model and compares them with the results provided in the Oxera report, actual fund sizes and data on past failures as reported by Oxera» [4, p. 4].

Lindset (2008) analyses how «Value at Risk (VaR), a risk measure, can be used to calculate contributions to a life insurance guaranty fund. The paper shows that this measure can be a first step towards taking risk and solidity into account when determining how much each insurer should contribute to the guaranty fund» [5, p. 1].

In January 2020 Ukraine's financial market regulators approved the Strategy for the Development of the Ukrainian Financial Sector until 2025 [6]. The Strategy Roadmap includes establishing a guarantee scheme for the deposits of credit union members and payments under life insurance contracts by the end of 2022.

The draft legislation that have been currently developed on this issue in Ukraine provide for the creation of a guarantee scheme for payments under life assurance contracts by integrating with the existing deposit guarantee scheme on the basis of the Deposit Guarantee Fund.

The minimum amount of life insurance guarantee fund according to the draft low cannot be lower than 0.5 percent of the amount of guaranteed payments under life insurance contracts within the maximum coverage limit. The draft low provides for the mandatory participation of life insurance companies in the IGS. All participants will be required to make an initial (1% of the equity capital amount) and regular (1% of the amount of premiums raised in hryvnia and 1.2% in foreign currency quarterly) contributions. The IGS fund will be empowered to establish differentiated levies, the amount of which is determined by weighing the basic annual rate for the risk degree according to the method developed by the fund [6].

However, despite legislative initiatives, there is no comprehensive vision of the design features of insurance protection scheme in Ukraine with regard to the limit and scope of coverage and overall funding mechanisms.

The purpose of the research is to establish methodological approaches to creating funding mechanism of insurance guarantee scheme for consumer protection in Ukrainian life insurance market.

**Research methodology and methods.** When highlighting positive and negative effects of IGS implementation and substantiating economic effects of risk-based approach to assessing insurers' contribution, synthesis and analogy methods have been used, whereas proposing decisions on insurance guarantee scheme design and appropriate sources of its funding a comparative analysis has been applied. While estimating the aggregate risk index of *i*-th IGS member, the combination of «bucket» method and «sliding scale» method was proposed. Core risk indicators which capture various aspects of the IGS member's risk profile were specified using methods of financial analysis.

**Research results.** The insurance guarantee costs are largely distributional and the redistribution depends on the IGS design, notions of fairness and proportionality, as well as on the effectiveness of other protection mechanisms (strict prudential framework, actual solvency regime — Solvency I or Solvency II, insurer's internal risk management) in preventing insurance failure.

*Fig. 1* summarises the pros and cons involved in the decision to establish an IGS. When established, policyholder protection funds should be designed carefully to minimise any drawbacks, particularly the moral hazard problem and the burden on soundly managed member companies. Moral hazard of the IGS can be reduced through prudential supervision and regime Solvency II which set higher capital requirements for greater risk-taking.


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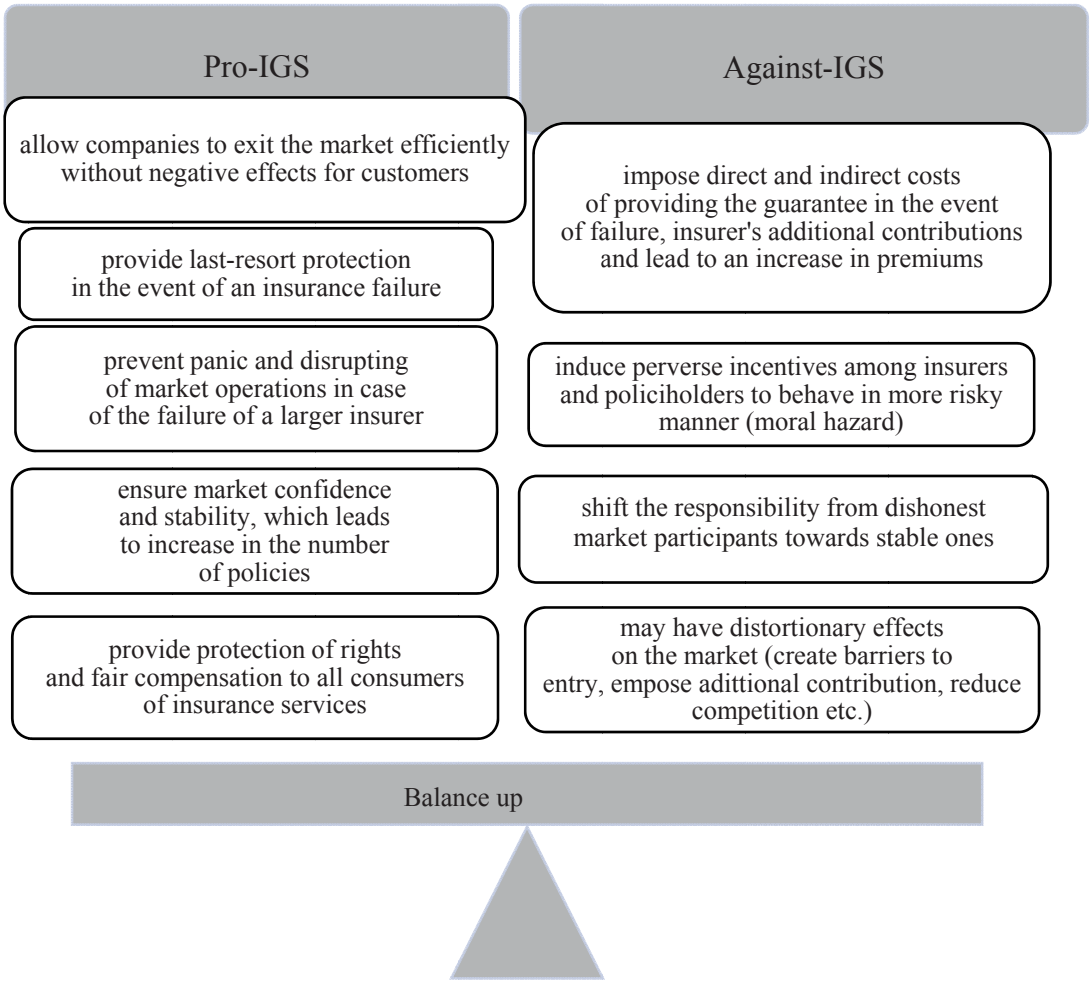


Fig. 1. **Positive and negative effects of IGS implementation**

*Source*: built by the authors.

The decision on particular scheme design should be based on the aim to achieve an optimal balance between IGS' evaluation criteria and objectives — key considerations, which are often contradictory and should be weighed:

1. Market confidence and stability — how much the IGS increases consumer confidence in savings and supports the demand for insurance services?

2. Consumer protection — how effectively the IGS mitigates financial losses in the event of insolvency of insurers?

3. Market competition — whether the system doesn't impede free competition and facilitate the entry of inefficient players in the market?

4. Incentives — whether the scheme offers incentives for healthy behaviour or reduces moral hazard?

5. Fairness (fair redistribution of funds) — how much redistribution from the many (solvent insurers) to the few (insolvent and weak insurers) is deemed necessary and fair?

6. Operating costs and degree of premium redistribution — aren't they a huge burden on the market?

There is no single IGS that fits all criteria, as economically efficient options are often not the most practical, and inexpensive options may not provide the desired protection. The decision on IGS design «depends on the weight attached to the different criteria, and is therefore a matter for policy» [7, p. 4].

Appropriate fund-raising mechanisms are crucial for effective work of IGS. The sources and structure of funding determines the level of protection as well as the level of levies imposed on insurers which will translate into costs for policyholders (*Fig. 2*). The following points therefore

need careful consideration: timing of the funding (ex-ante or ex-post funded scheme), appropriate target level for funding, calculation of annual contributions to a scheme and compensation limits.

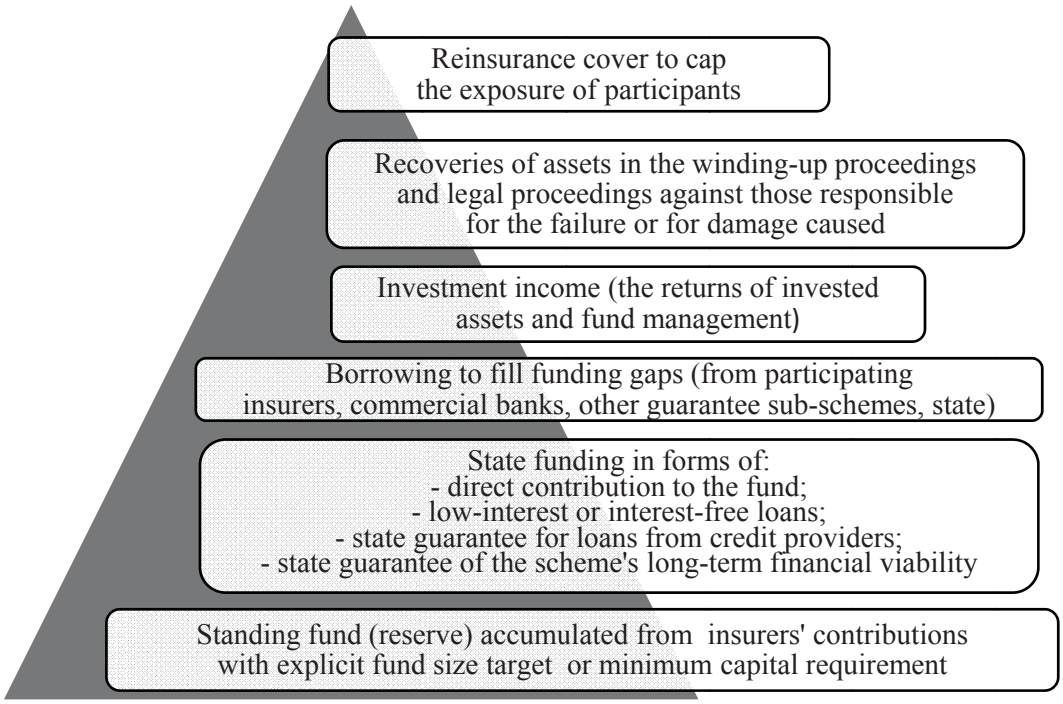


Fig. 2. **Sources of funding for guarantee schemes**

*Source*: compiled by the authors using [1; 8].

*Fig. 2* shows the share and importance of each source of funding in the overall funding structure of the scheme. To determine the total amount of funds to be raised from contributors to the IGS, there has to be an allocation mechanism.

In practice, insurers contribute to existing IGSs in the EU in proportion to the size of their business. Contribution can be calculated as a percent of mathematical provisions of life assurers (0.05% in France), as a percent of life assurance net reserves (0.02% in Germany) or allocated on the basis of gross premiums (in Poland) or even number of insurance policies (fixed annual amount per policy in Denmark). Target capital is specified in the rules of many European IGS as an amount set in euros or as a percentage of life assurance reserves. If the contribution is paid on the ex-ante basis, the schemes are empowered to levy additional contribution in case of participants' insolvency [7].

As in any insurance mechanism, each insurer, which is the member of IGS, can be considered as creating expected losses to the scheme in the future, depending on the probability of insolvency and the level of cost arising in case of failure. The expected losses may vary over time as the insurer's risks evolve. That's why the fair approach to funding an IGS would be risk-weighting of insurers' contribution, so the levy each insurer contribute to the scheme should be proportionate or equal to the expected losses of the IGS imposed by the member. Companies posing greater risks of triggering IGS expanses would be charged higher contribution.

The economic advantages of risk-based approach to assessing contribution are realized only in a IGS funded on ex ante basis, when failed insurers would have contributed to the scheme before their failure.

Risk-weighted levies can be considered as having strong incentive influence, since it:

- partially removes cross-subsidy between insurers when high-risk companies play for the cost of low-risk members;
- prompts insurers to control their risks;
- encourages insurers to more accurate risk assessment;
- alleviates incentives for the moral hazard behaviour of weak insurers;


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– doesn't allow more risky firms gain a competitive advantage by setting policy rates lower than that of less risky competitors, reduces concerns that market prices don't reflect the risk to policyholders.

Therefore risk-weighted approach to setting IGS provides more effective and healthy competition and field conditions in the market, than in case of equal levies for every member. On the other point of view, rising levies from the weakest firms could further deteriorate their financial position triggering more failures which may have a negative effect on consumer protection and levy additional costs on solvent insurers.

If the risk-based approach is not introduced to the supervision system first, the situation that insurers may not be able to afford the full economic cost they impose on IGS is likely to be possible.

Our research results provide evidence that the introduction of funding mechanism of a life IGS in Ukraine should be provided with the principles described below.

The contribution from each member of IGS should be calculated as a percentage of its contribution base, with adjustment by means of both quantitative indicators of the relative weight of each life assurer in terms of covered net reserves (mathematical provisions) of all members $\sum_i NR_i$:

$$q_i = \frac{NR_i}{\sum_i NR_i}, \quad (1)$$

where $NR_i$ — net reserves of $i$-th member and qualitative information using a set of weighted indicators aggregated by a composite risk factor $\beta_i$, ranging from a maximum reduction to 75% to a maximum increase to 150%.

The most common algorithm of estimating annual contribution to the IGS fund is plotted on *Fig. 3*.

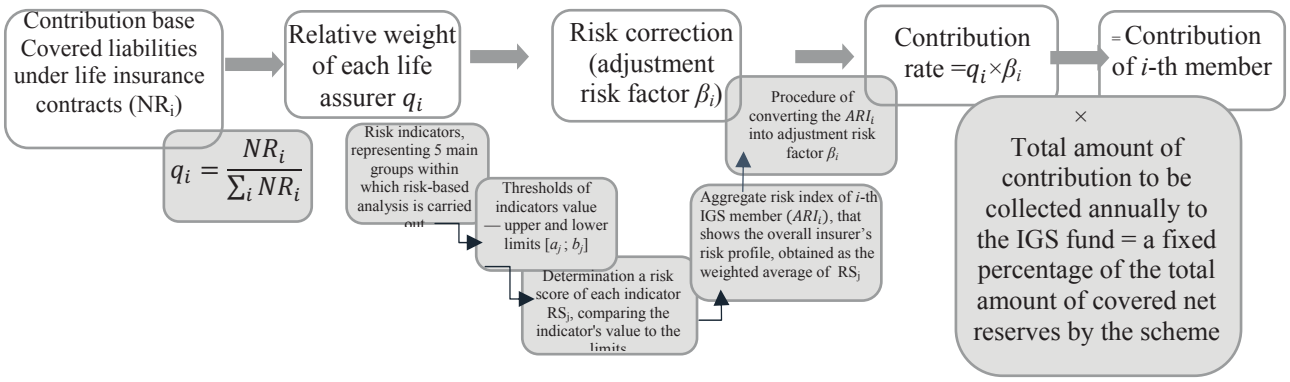


Fig. 3. **Proposed general scheme of estimating the contribution to the IGS fund**
*Source*: built by the authors on the base of [9—11].

In other words, total contribution to be collected is a fixed percentage of the total amount of covered liabilities by the IGS scheme. This general scheme is based on an assumption that target amount of the guarantee fund must be reached in set number of years so that contributions should be spread evenly across this period of time. Annually collected contributions may be adjusted regularly by the board of the scheme to reflect any changes (improvement or deterioration in the soundness of the insurance sector) by revising the amount of resources collected by the IGS scheme.

Calculation of the adjustment risk factor $\beta_i$ for each participating institution should be carried out individually based on the evaluation of various risk indicators, including capital adequacy, asset quality, liquidity and funding, profitability profile, business management, as well as the potential loss for the IGS (*Tabl.*). Each IGS «should define its own set of risk indicators in order to reflect the differences in risk profiles of its member institutions» [12, p. 22].

Table

**Core indicators proposed for risk-based adjustment of IGS member contribution**

| Groups of risk indicators | Core indicators and its definition $R_j$ | Thresholds $[a_j; b_j]$ | Weight |
|---|---|---|---|
| Capital adequacy (Solvency profile) | CAR (Capital adequacy ratio) = actual capital / required risk-based capital | $[a_1; b_1]$ | 11% |
| | Inverse solvency ratio = total liabilities /capital | $[a_2; b_2]$ | 11% |
| Asset quality and liquidity | Solvency ratio = net assets / net premium written | $[a_3; b_3]$ | 10% |
| | Liquid assets/current liabilities | $[a_4; b_4]$ | 10% |
| | Risk-Weighted Assets / Total Assets | $[a_5; b_5]$ | 10% |
| Income/profitability profile | Expense ratio = expense/net premium | $[a_6; b_6]$ | 5% |
| | Investment yield = net investment income / average investment assets | $[a_7; b_5]$ | 5% |
| | Return on assets (ROA) (Net Income / Total Assets) | $[a_8; b_8]$ | 5% |
| Business management and model | Duration of assets and liabilities<br>Sensitivity of the soundness to market and economic risks | | 16% |
| Potential losses for the IGS | Insurer's market share (total gross-premiums of the insurer/ total gross-premiums of life insurance market) | $[a_{10;}\ b_{10}]$ | 5% |
| | Unencumbered assets / Covered net reserves | $[a_{11}; b_{11}]$ | 5% |
| | Expected shortfall of the insurer | $[a_{12}; b_{12}]$ | 7% |

*Source*: built by the authors on the base of [11—13].

Thresholds in *Table* are determined by the supervisory authority for each *j*-th risk indicator by assigning the upper and lower limits $[a_j; b_j]$. Comparing the value of the indicator to the limits, one can determine a risk score of each indicator:

$$RS_j = \begin{Bmatrix} 0 \ \ if \ \ Rj > b_j \\ 1 \ \ if \ Rj < a_j \\ \frac{b_j - R_j}{b_j - a_j} \ \ if \ a_j \le Rj \le b_j \end{Bmatrix} \text{ in case when a higher value indicates higher risk;}$$

$$RS_j = \begin{Bmatrix} 1 \ \ if \ \ Rj > b_j \\ 0 \ \ if \ Rj < a_j \\ \frac{R_j - a_j}{b_j - a_j} \ \ if \ a_j \le Rj \le b_j \end{Bmatrix} \text{ in case when a higher value indicates lower risk,} \quad (2)$$

where $RS_j$ is the *j*-indicator's risk score ($j = 1,..., n$), $R_j$ is the value of *j*-th risk indicator, $b_j$ is the upper boundary, $a_j$ is the lower boundary.

The aggregate risk index of *i*-th IGS member ($ARI_i$), that shows the overall insurer's risk profile we can obtain as the weighted average of indicators' risk scores. For this aim indicator's risk score should be multiplied by its risk weight and the obtained products must be added:

$$ARI_i = \sum_{j=1}^{n} W_j \cdot RS_j,$$

$$\sum_{j=1}^{n} W_j = 1, \quad (3)$$

where $W_j$ is the indicator weight, established by the supervisory authority.

Then for the purpose of calculation the individual contributions of *i*-th insurer, its aggregate risk index $ARI_i$ should be translated into an adjustment risk factor $\beta_i$.

The supervisory authority needs to prescribe the adjustment procedures of converting the $ARI_i$ into $\beta_i$, choosing among the alternatives:

— taking that risk factor is usually adjusted to range between 0.75 (lower boundary) and 1.25 or even 1.5 (upper boundary) according to the practice of European IGS and deposit guarantee


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systems, the risk index $ARI_i$ of $i$-th insurer can be translated into an aggregate risk factor ($\beta_i$) using the linear formula:

$$\beta_i = \begin{cases} \alpha, & if\ ARI_i < ARI_{\min} \\ \gamma, & if\ ARI_i \geq ARI_{\max} \\ \alpha + (\gamma - \alpha) \cdot \frac{ARI_i - ARI_{\min}}{ARI_{\max} - ARI_{\min}}, & if\ ARI_{\min} \leq ARI_i < ARI_{\max} \end{cases}, \quad (4)$$

where α and γ show the lower and upper boundaries of $\beta_i$ respectively;

$[ARI_{\min}, ARI_{\max}]$ — the interval within which most values of $ARI$ vary;

— by using the bucketing method, or a set of $ARI$ thresholds to classify IGS members into rating (risk) classes. The intervals of the $ARI$ index are linked to a corresponding risk class and a relevant aggregate risk factor $\beta_i$ from the range [0.75—1.5].

On *Fig. 4* possible effect of applying a risk adjustment factor $\beta_i$ to the estimation of member's contributions to the IGS fund is depicted: for a given contribution base ($x$ axis), instead of having a single value for the contribution ($y$ axis), there are a range of values depending on the $\beta_i$ applied.

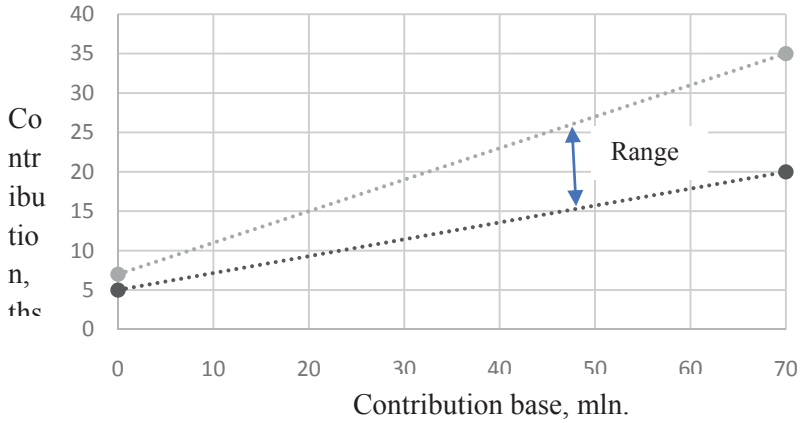


Fig. 4. **Possible effect of risk adjustment on member's contributions to the IGS**
*Source*: [9].

For instance, risk-based approach was implemented in German life assurance guarantee scheme funded on an ex ante basis. Each participating insurer has a share in the accumulated capital of the IGS, which is determined:

$$\frac{net\ reserves\ of\ life\ assurer}{total\ reserves\ of\ all\ paticipating\ life\ assurers} \cdot risk\ factor. \quad (5)$$

An individual risk adjustment for insurer depends on the company's equity capital relative to its solvency margin. Using this matric, companies are ranked from lowest risk to highest risk and classified into three risk categories.

For firms in category 1 (low risk), a risk factor of 0.75 is applied to the net reserves; for firms in category 3 (high risk), a risk factor is 1.25 and for firms in category 2 (medium), the risk factor is adjusted on a linear basis to range between 0.75 and 1.25. The annual contribution of each insurer is increased (or decreased) if the company's actual share in the accumulated capital is lower (or greater) then the share it should have, based on its relative net reserves and risk.

Annual total contribution amount to 0.02% of life assurance net reserves of all members, until the accumulated capital reached the target of 0.1% of life assurance net reserves. If required in the event of failure, the scheme can raise additional special contributions up to 0.1% of net reserves [2].

**Conclusions.** Life insurance, as well as bank deposits, is a form of household savings, so contributions under life insurance contracts must be properly guaranteed by creating compensation mechanism. At the same time, policymakers of life IGS scheme introduction should refrain from copying measures designed for the banking sector. The ways in which banks and insurers become insolvent differ. During bankruptcy, banks deal with large-scale, continuous withdrawal of deposits over a short period of time. Unlike banks, insurance companies are aware of future expected insurance payments and can fulfil their obligations under insurance contracts for an extended period of time. This greatly reduces the need for a large guarantee fund which should be readily available.

Homogeneous regulation (without taking into consideration the risks of financial institutions) can no longer provide an adequate level of consumers rights protection and prevent cases of insurers' insolvency. Also, it is necessary to include additional risk measures when evaluating the life insurance guarantee contribution, which would contribute to a reduction in the negative effects of the IGS.

The methodology and general scheme of estimating the contribution to the IGS fund presented in the study is relevant not only for Ukraine, where the introduction of the IGS scheme for life assurance is only in perspective, but also for all other countries with existing IGS to implement risk-weighted approach to scheme setting that prompts insurers to control their risks, provides more effective and healthy competition and field conditions in the market.

It is crucial to set thresholds at levels which appropriately reflect differences between risk profiles of member insurers. For this reason future research in the specified area should focus on further clarification and calibration of the risk indicators thresholds [aj; bj] and its risk weights by developing models for assessing the impact of risk indicators on economic cost insurer impose on IGS scheme in a more complex way.

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