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**Review Paper**

# The Strategy for Managing Financial Resources of the Pension System of the OECD Countries and Ukraine

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**ABSTRACT**

The article considers the special conditions for the implementation of the strategy for managing the financial resources of the pension system of the OECD countries and Ukraine. A strategic financial and economic mechanism has been developed to assess the quality of financial resources management of the country's pension system through partial socio-economic and demographic indicators of the economic system. The method of managing the formation, distribution and use of financial resources of the state pension system is determined. The block diagram of the strategic financial and economic mechanism for the management of financial resources of the pension system within the economic and demographic indicators, as well as the parameters of state economic policy is presented. The real value of the replacement ratio per 1% of GDP and the efficiency ratio of the financial resources management of the pension system in the OECD countries and Ukraine are analyzed. The structure of investment portfolios of OECD pension funds is presented. The forecast trend of the demographic burden coefficient and the share of state funding of the pension system to GDP in the OECD countries and Ukraine are determined. The forecast trend of budget revenue and average wages is calculated. As part of the distributive approach to financing pension payments, an old-age pension payment method has been introduced, taking into account the socially acceptable level of income compensation, insurance premium rate, and demographic structure of the population, real wages and changes in social security payers.

**HIGHLIGHTS**

- The article aims to analyze and develop a strategic financial and economic mechanism for managing the financial resources of the pension system in OECD countries and Ukraine, considering factors such as socio-economic and demographic indicators, replacement ratio, efficiency ratio, investment portfolios, demographic burden, state funding, budget revenue, and average wages, and proposing an approach for distributing pension payments based on income compensation, insurance premiums, and demographic factors.

**Keywords:** Financial Resources Management, Pension Provision, Pension System, Strategy

The strategy of financial resources management, taking into account European and global trends, should correspond to the realities of the economic development of countries with further definition of mechanisms for managing the pension system. At the same time, the legally established methodological provisions on actuarial calculations of the consolidated system, which provide an

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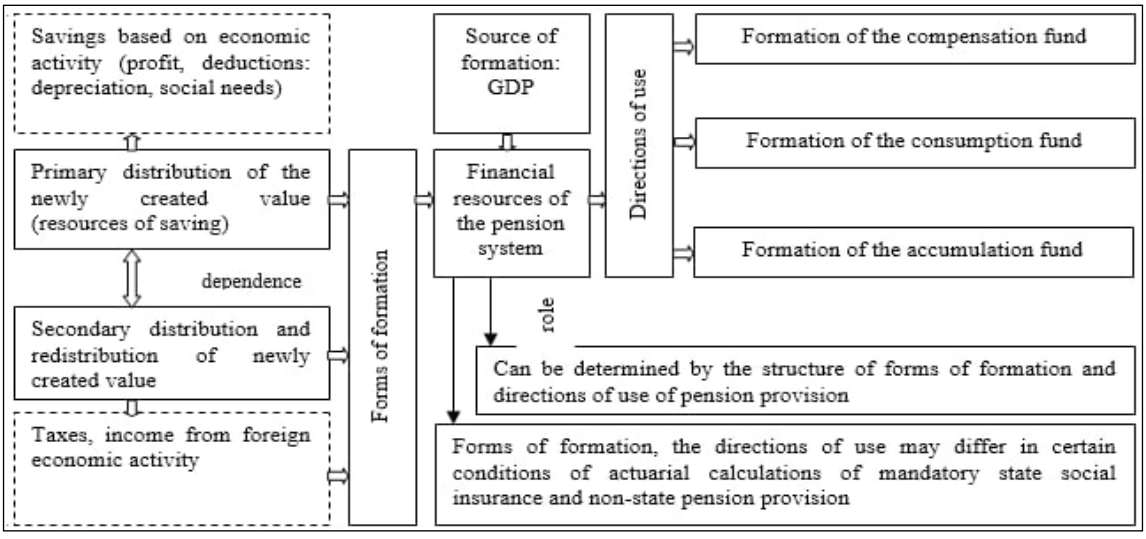
assessment of the quality of distribution and accumulation of financial resources by the levels of innovation of instruments of the financial and economic mechanism of the pension system of Ukraine, require urgent research (Aleskerova *et al.* 2020). Effective management of the financial resources of the pension system is one of the most difficult tasks for any state. It should be noted that most countries that direct their vector of socio-economic development to reform the pension system are facing changes in the general concept of improving living standards, which in the modern paradigm of financial resources management demonstrates organizational and functional features of pensions, activates a new phase for citizens to use their own well-being when they reach retirement age (Aspegren *et al.* 2019). In addition, the management of financial resources for pensions as the most important and necessary area of the national economy allows to determine an acceptable standard of living for retirees, create incentives for quality education of young people, their active and long work, create social stability and economic security of the state with the vector of competitiveness and in the framework of the national strategy of socio-economic development (Babenko-Levada and Morozova, 2020). Analysis of the subjective composition of the consolidated pension system, the study of the stability and efficiency of the management of financial resources of the pension system and state regulation of certain areas of the national economy was performed by G-C. Toma and G. Tuchilus (2019).

The priority of the research is the development of a strategic financial and economic mechanism that allows to assess the quality of management of financial resources of the country's pension system through partial socio-economic and demographic indicators of the economic system, which operate through a structural and functional scheme of pension provision with elements of mandatory state social insurance, forming specific effective directions of financial stability and state economic policy (Barr and Diamond, 2009).

## MATERIALS AND METHODS

A significant role of financial resources in ensuring the development of the pension system is highlighted. Such resources are characterized by certain conditions for their attraction and limitations. In the context of the studied resources, we emphasize the expediency of their effective use in terms of the level of existence of the pension system (Malyshko, 2020). Economic growth of the state encourages an increase in the share of the employed population, and accordingly, the wages of workers, which increase tax revenues to the budgets of pension funds and non-state pension funds (NSPF). In this aspect, effective measures to improve such efficiency in each specific environment of pension provision and mandatory social insurance are shown in Fig. 1.




***Source:*** *Compiled by the authors on the basis of N.V. Martynenko (2017).*

**Fig. 1:** Sources and forms of the formation of financial resources of the state pension system

A pension system is mature if the youngest payers of contributions in it are eligible to receive pension contributions. The key aspects of applying a number of methods of managing the formation, distribution and use of financial resources of the pension system at the state level are highlighted below (Fig. 2).

Among the indicators of the functioning of the distribution system, the coefficient of dependence is distinguished ($K_d$), which is equal to the ratio of the number of pensioners (individuals receiving payments – $Q_p$) to the number of social contribution payers ($Q_{psb}$):

$$K_d = \frac{Q_p}{Q_{psb}} \quad \ldots(1)$$

Depending on the principles of Organization of the pension system, their institutional form changes, and the political and economic consequences of the introduction of each of the pension systems will also be different (Fig. 3).

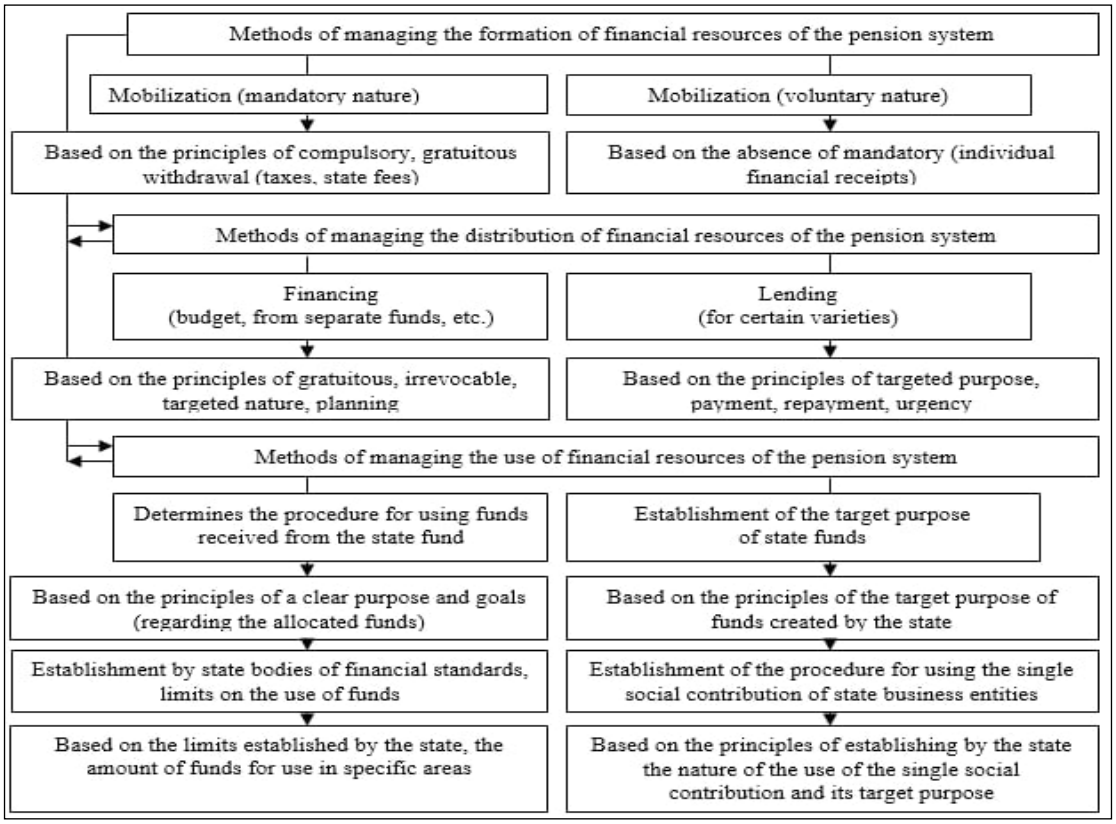
The coefficient of efficiency shows the amount of pension provided under the national pension system per unit of public expenditure on pensions, taking into account the existing demographic characteristics of the country and will be determined by the following formula:

$$E_{ps} = \frac{K_s}{R_{dbnbp}} \times K_{dn} \quad \ldots(2)$$

It should be noted that this definition is best suited to the task of interstate comparative analysis set in the study, as it allows to assess the effect of spending funds on pensions in units of replacement rate and takes into account differences in demographic conditions between countries. In more detail, formula (2) can be represented in algorithm:

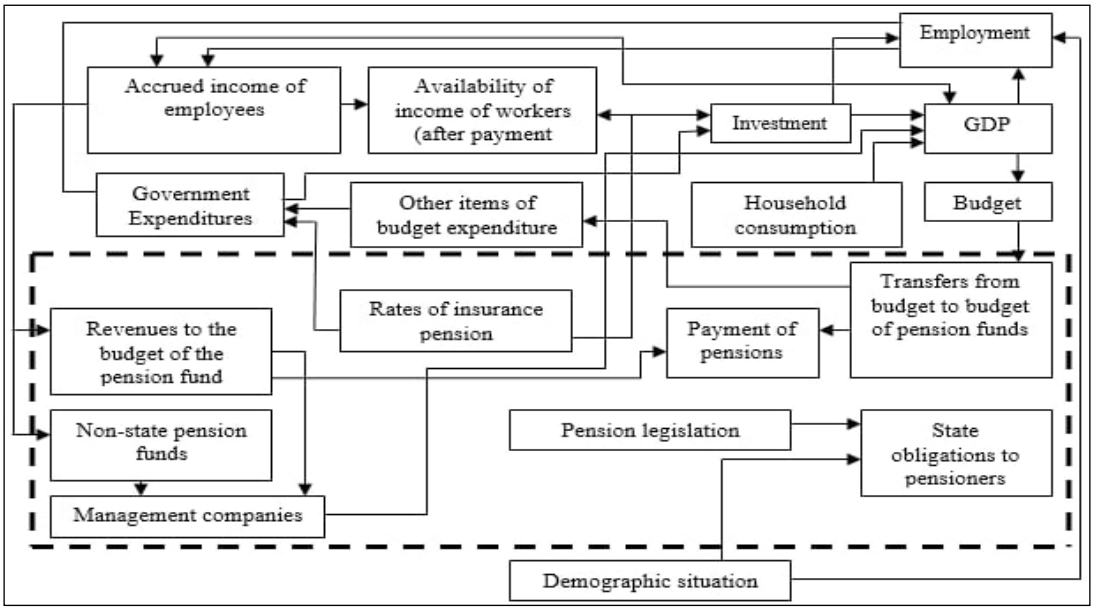
$$E_{ps} = K_s \times \frac{H_{pa} / H_{pab}}{P_b / GDP} = K_s \times \frac{H_{pa}}{P_b} + \frac{GDP}{H_{pab}} = K_s \times \frac{GDP_{for\ 1\ pab}}{P_{b\ for\ 1\ pab}} \quad \ldots(3)$$

where, $H_{pa}$– the population of retirement age; $H_{pab}$ – the working age population; $P_b$ – pension expenses;



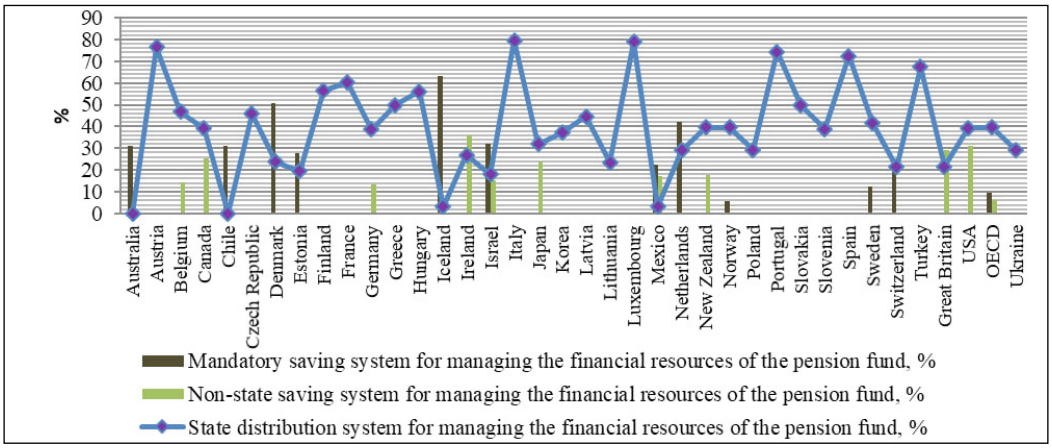

***Source:*** *Compiled by the authors on the basis of I. Taptunova et al. (2021), N. Vnukova et al. (2020).*

**Fig. 2:** Methods of managing the formation, distribution and use of financial resources of the state pension system




***Source:*** *Compiled by the authors on the basis of O. Kolodiziev et al. (2021).*

**Fig. 3:** Block diagram of the strategic financial and economic mechanism for managing financial resources of the pension system within the framework of economic, demographic indicators and parameters of State Economic Policy




***Source:*** *Built by the authors according to data of L. von Bertalanffy (1950).*

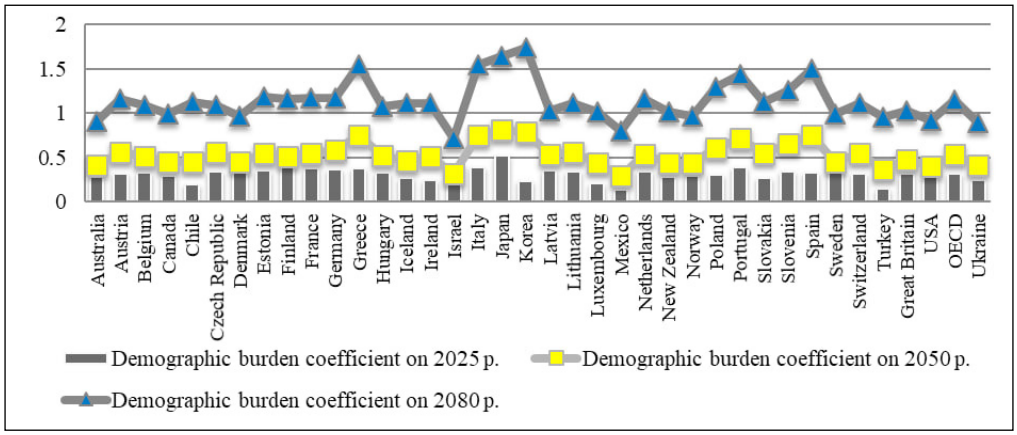
**Fig. 4:** Replacement rate in OECD countries and Ukraine for 2021, %

GDP – Gross Domestic Product; $GDP_{for1pab}$ – GDP per citizen of working age; $Pb_{for1pab}$ – pension costs per 1 citizen of retirement age.

## RESULTS AND DISCUSSION

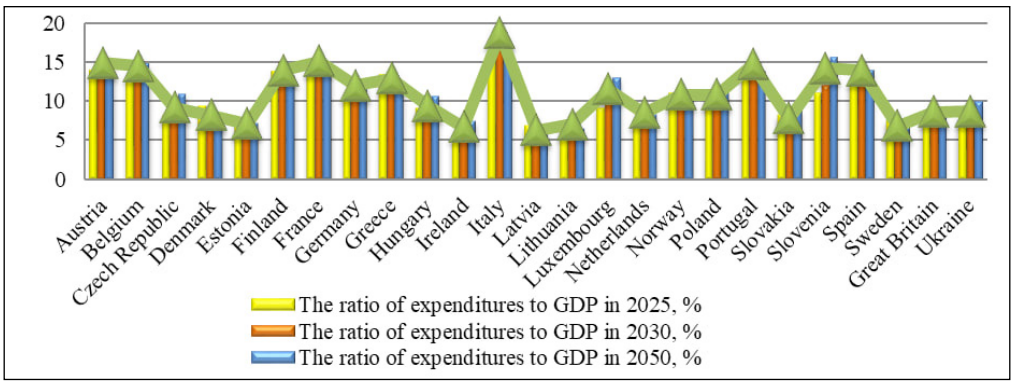
The complex process of managing the formation, distribution and use of financial resources of pension systems in any country allows maintaining the quality of life of citizens after work and the rationality of financial resources through the synchronicity and rhythm of their transformation into money supply represents the replacement ratio which determines the ratio of pension to salary in the country. Thus, the replacement rate according to the structure of the pension system in most OECD countries in 2021 shows a steady trend in the number of retirees who receive 55.2% pensions from the level of income they had before retirement. This is almost 1.89 times higher than in Ukraine (29.2%). This is despite the fact that the level of income of working citizens in OECD and EU countries is much higher than in Ukraine (Fig. 4).

The management of financial resources for pensions in the leading countries of the world is carried out according to the state distribution system, with the




***Source:*** *Built by the authors according to data of L.P. Sidelnykova (2016) and L. von Bertalanffy (1950).*

**Fig. 5:** Forecast trend of the demographic burden coefficient in the OECD countries and Ukraine for 2025-2080, %




***Source:*** *Built by the authors based on Melbourne mercer global pension index (2019), D. Knox et al. (2020).*

**Fig. 6:** Projected share of state funding of the pension system to GDP in OECD countries and Ukraine for 2025-2080, %

exception of Chile, Mexico and Iceland (Scobie *et al.* 2015). The most important demographic indicator in terms of the sustainability of pension systems is the coefficient of demographic burden, which shows the ratio of payers of pension contributions to the number of retirees (Fig. 5).

In order to consider the impact of demographic factors on the financing of pension systems, the projected size of government spending on pensions was estimated (Fig. 6).

As for the pension system of Ukraine, with an indicator of 2.65 percentage points of the replacement rate of 1% of GDP of public expenditures, it is one of the least effective among the countries, mainly due to the high value of the demographic burden (Fig. 7).

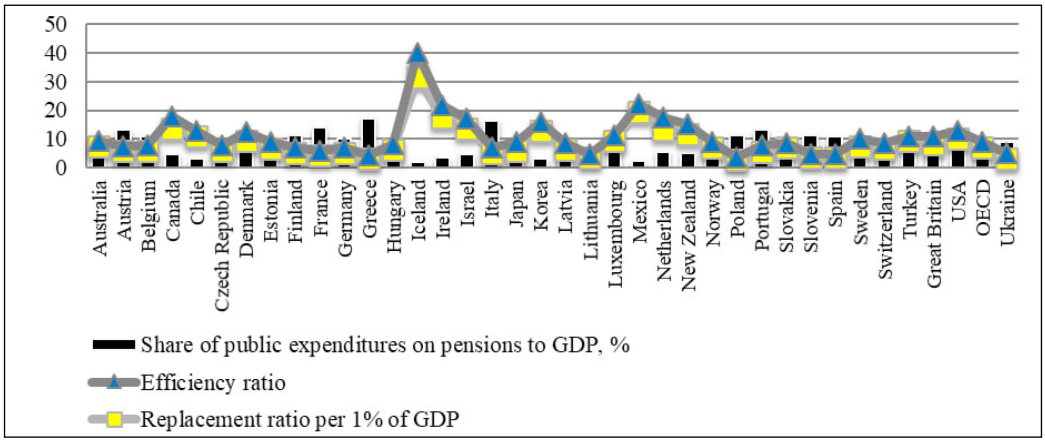
Another necessary object of analysis of the activities of non-state pension funds of the developed countries is their investment portfolio (Fig. 8).

To model the strategy of the development of the distribution subsystem of financial resources management of the pension system of Ukraine, the forecast trend of the dynamics of budget revenues of Ukraine and the average wage for 2022-2030 is built (for calculating the coefficient the average growth rate of 2015 is taken) which is presented in Fig. 9.

Within the framework of the distributive approach to the financing of old-age pension payments is carried out at the expense of contributions paid by participants in the same period, and the stability of the system in the form of a mathematical structure is represented by the following formula:

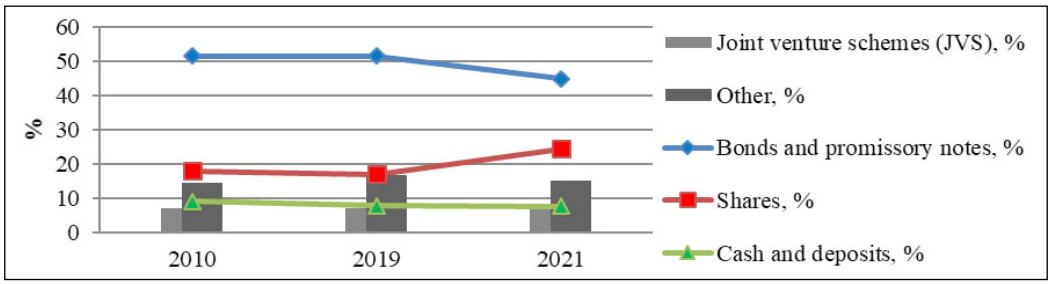
$$Sb_n + Su = Sw_n + T \qquad \ldots(4)$$

where, $Sb_n$ – the amount of pension benefits in the period $n$; $S_u$ – excess of revenues over payments; $Sw_n$ – the amount of contributions in the period $n$; $T$ – excess of payments over revenues.



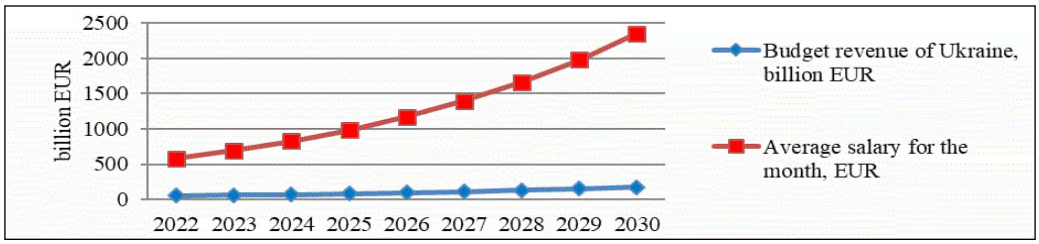

***Source:*** *Built by the authors according to data of Mercer CFA institute global pension index (2021).*

**Fig. 7:** Comparative indicators of the efficiency of management of financial resources of pension systems in the OECD countries and Ukraine in 2021, %




***Source:*** *Built by the authors according to data of Pensions at a glance 2019: OECD and G20 indicators (2019).*

**Fig. 8:** Structure of investment portfolios of OECD pension funds




***Source:*** *Calculated by the authors.*

**Fig. 9:** Forecast trend of budget revenue and average wages in Ukraine for 2022-2030

The amount of old-age pension payments in the period is determined by the formula:

$$Sb_n = \sum_{j=n-t-m}^{n-t} \sum_{i=0}^{w_j} \left( \sum_{k=n-t-m}^{n} PR_{i,k} I_{k,n} A \right) \quad \ldots(5)$$

where, $j$ – years of birth of payers from $n - t - m$ to $n - t$; $t$– set age of old-age pension; $m$ – the number of years from $t$ to 100; $w_j$ – participants of the $j$ year of birth; $i$ – payer of the $j$ year of birth; $PR_i$, $k$– annual salary fund of the payer in year $k$; $I_k$, $n$– coefficient of indexation of contributions of the $k^{th}$ year in the year $n$; $A$ – socially acceptable level of income compensation.

The amount of old-age pension payments to the participant in period $n$:

$$\sum_{k=n-t-m}^{n} PR_{i,k} I_{k,n} A \quad \ldots(6)$$

The amount of old-age pension payments to participants of the $j$ year of birth in the period $n$:

$$\sum_{i=0}^{w_j}\left(\sum_{k=n-t-m}^{n} PR_{i,k} I_{k,n} A\right) \quad \ldots(7)$$

In period $n$, participants contribute in the amount determined by formula:

$$Sw_n = \sum_{i=n-t}^{n}\sum_{i=0}^{w_j} PR_{i,k} Rst_j \quad \ldots(8)$$

where, $PR_{i,k}$ $Rst_j$ – the amount of contributions of participants of the $j$ year of birth; $w_j$ – participants who pay contributions for the year $n$; $Rst_n$ – annual salary fund of the insured person in year $n$; $Rst_j$ – the rate of insurance premium for the distributive component for $I$ participant of the $j$ year of birth.

The tariff of the insurance contribution of the distribution component is determined based on the socially acceptable level of income compensation for a socially determined period of contributions and payments according to formula:

$$Rst_j = \frac{A\overline{m}}{\overline{n}} \quad \ldots(9)$$

where, $Rst_j$ – the rate of contribution of the payer of the $j$ year of birth; $A$ – socially acceptable level of income compensation; $\overline{m}$ – the average period of payments; $\overline{n}$ – the average period of contributions.

Under conditions of balance of the distributive component, the values $S_u$ and $T$ in formula (4) are zero, then by the substitution in this equality of the values $Sb_n$ from (5) and $Sw_n$ from (8) substituting $Rst_j$ for the value of formula (9) we obtain equation:

$$\sum_{j=n-t-m}^{n-t}\sum_{i=0}^{w_j}\left(\sum_{k=n-t-m}^{n} PR_{i,k} I_{k,n}\right) = \sum_{j=n-t}^{n}\sum_{i=0}^{w_j} PR_{i,k}\frac{\overline{m}}{\overline{n}} \quad \ldots(10)$$

Under conditions of constant real wages, formula (10) will look like this:

$$\left(\sum_{j=n-t-m}^{n-t}\sum_{i=0}^{w_j}\left(\sum_{k=n-t-m}^{n} PR_{i,k} I_{k,n}\right)\right)\Bigg/\sum_{j=n-t}^{n}\sum_{i=0}^{w_j} PR_{i,k} = \overline{m}/\overline{n} \quad \ldots(11)$$

The increase in life expectancy $\overline{m}$ can be compensated by an increase in the average contribution period $\overline{n}$, according to the right-hand side of formula (11). Due to the growing number of retirees:

$$\sum_{j=n-t-m}^{n-t}\sum_{i=0}^{w_j}\left(\sum_{k=n-t-m}^{n} PR_{i,k} I_{k,n}\right) \quad \ldots(12)$$

With a constant level of the tariff to ensure the conditions of formula (11), the growth of payments requires a corresponding change in the number of payers (Shumylo, 2015):

$$\sum_{j=n-t-m}^{n-t}\sum_{i=0}^{w_j} PR_{i,k} \quad \ldots(13)$$

The impact of macroeconomic and demographic indicators to maintain the provision of the distribution subsystem with its own financial resources can be calculated by changing the parameters.

## CONCLUSION

Thus, the main strategic directions of managing the financial resources of the pension system of any country should be in line with the latest international practice, which should also take into account their own experience in building and developing a pension system. They should fully reflect the social, demographic and economic realities of the modern state in the context of increasing the adequacy of pension benefits (increasing the final replacement rate in the pension system); stabilizing the financial stability of the pension system and ensuring an affordable level of additional support for the pension system; reducing the dependence of the pension system on public funding; optimization of administrative costs and improving the efficiency of financial resources in the country's pension system; distribution of the burden of pension benefits by sources, levels and forms of funding; development of initiatives and infrastructure to stimulate the formation of savings during the work of the individual within the voluntary savings subsystem; increasing the level of coverage of the working population with the pension system within the voluntary savings subsystem; proportional increase of the retirement age in order to ensure its compliance with the growing life expectancy in the country; increasing the ratio of employees to retirees; the need to introduce a mandatory saving element of the pension system of the country.

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