PRINCIPLE OF ACTUARIAL EVALUATION AND UPDATING OF THE BALANCE OF THE PENSION SYSTEM IN ROMANIA AND THE EUROPEAN UNION

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DOI: 10.51865/JOLAS.2025.23.09

Abstract:
The national pension systems in Romania and the European Union are usually based on the principles of social solidarity and contributory so that they are composed in such a way as to be self-sustaining through contributions to pension systems but from other contributions, so that the state, in the case of Romania, intervenes as little as possible with budgetary allocations to support the pension system. Unfortunately, these pension systems, based on a certain historical path approved by time, tend to no longer satisfy the sustainability of these pension systems so that we felt the need to come up with some analyses and ideas to support the sustainability of the pension system. At the level of the European Union, there is even a sustained, at the level of principle, assessment of the actuarial update of the pension system according to the Statute of the European Civil Servant, so that we suggest that within the Statute of the Civil Servant in Romania as well. But not only that such a principle be introduced and that such an issue be emphasized.
Keywords: *sustainability, pension system, actuarial valuations and updates.*

There are many studies and reviews about pensions and the sustainability of the pension system that analyze this aspect, so in our study we will try to make some references to these aspects through the incidence of applying the principle of actuarial evaluation and updating of the balance of the pension system, both in Romania and in the European Union.

The Romanian pension system faces significant challenges, driven by demographic, economic and social changes. The actuarial assessment and updating of the balance of this system is an essential tool to ensure financial sustainability and

intergenerational equity. This study aims to present the actuarial methods used to assess the pension system, the main challenges Romania faces and recommendations for its adaptation and modernization.

This system is based on a pay-as-you-go (PAYG) model, in which contributions from current employees are used to pay current pensions. This model is sensitive to demographic variations and its equilibrium depends on the ratio between the number of contributors and the number of pensioners.

1. *General aspects regarding the principle of actuarial assessment of the balance of the pension system*

1.1. General notions

Actuarial value is a concept used in the fields of insurance and finance to evaluate the present and future financial value of a financial commitment or benefit, taking into account the probabilities of certain events occurring and the associated risk factors. More specifically, actuarial value can be defined as:

a) The present expected value of a future stream of payments. This means calculating the present value of a series of payments to be made in the future, taking into account the interest rate and the probability of payment.

b) Assessing risks and determining the correct price of insurance products. Actuaries use statistical and probabilistic methods to estimate the frequency and severity of insured events (such as death, illness, accidents) and to calculate the insurance premiums needed to cover these risks.

c)Calculating the reserves needed to cover an insurance company's future liabilities. This involves estimating the amounts an insurance company needs to set aside to be able to meet future claim payments.

To better understand what we are referring to, we will first try to define the concepts we use in this study.

Thus, the actuarial value of the pension system is an essential indicator for assessing its long-term financial sustainability. It reflects the balance between contributions collected from the active population and future pension payment obligations,

taking into account demographic and economic factors, such as life expectancy, contribution rates, inflation and economic developments. In Romania, the legislative framework regulating the public pension system also establishes the actuarial methods used to assess its balance.

2. Analysis of several aspects regarding the application of the principle of actuarial assessment of the balance of the pension system in Romania

2.1. Introductory considerations

The legislative framework of the pension system in Romania is represented by Law no. 360/2023 on the public pension system. This law is the basic normative document that regulates the functioning of the public pension system. It establishes the calculation principles, the rights and obligations of contributors, as well as the framework for actuarial valuations. Over the years, the law has undergone amendments to reflect new demographic and economic realities.

The above-mentioned law represents the primary regulation incident in this analysis, which does not exclude the introduction into the equation of adjacent regulations, pertinent in this field. These secondary regulations are the orders and regulations of the Ministry of Labor, Family, Youth and Social Solidarity that include specific methodologies for calculating the actuarial value, establishing the basic parameters – such as life expectancy, contribution rates and annual adjustments – necessary for assessing the sustainability of the pension system, as well as actuarial reports and studies. In the context of the application of the law, institutions such as the National House of Public Pensions and other audit bodies carry out periodic actuarial studies, which are developed according to the methodologies established by legislative norms and administrative regulations.

Thus, we can appreciate that actuarial valuation represents the mathematical and statistical analysis of the financial flows of the pension system, with the aim of determining whether the income (contributions of current employees) is sufficient to cover future expenses (payment of pensions). This valuation involves the use of mathematical models to estimate key variables such as demographic evolution, life expectancy and economic

dynamics, and to determine the "actuarial value" - that is, the ratio between available funds and future obligations.

In practice, actuarial value is determined using various methods and mathematical models that take into account factors such as interest rates, mortality, morbidity, withdrawal rates and other demographic and economic data. In conclusion, actuarial value is an essential tool in financial risk management and in pricing insurance products, thus guaranteeing long-term financial sustainability.

Pension systems are one of the essential pillars of social security, providing financial support to people after retirement from professional activity. Maintaining the financial balance of these systems is crucial to ensure long-term sustainability and solvency. Actuarial valuation plays a vital role in this context, providing a detailed analysis of the risks and resources involved. Actuarial valuation is based on a series of mathematical and statistical rules and techniques to estimate future payment and income flows. Among these, the main components include:

-Demographic projections: These involve estimating the future number of pensioners and contributors based on demographic data (birth rate, mortality rate, migration, etc.).

-Financial analysis: Evaluating the future income and expenditure of the pension system. This includes projections of contributions, pension benefits and other administrative costs.

-Economic development rates: Considering the evolution of wages, inflation and other economic factors that can influence both contribution income and pension expenditure.

-Discount methods: Using the discount rate to calculate the present value of future payment and income flows, providing a clear picture of financial equilibrium.

2.2. Applying actuarial valuation in our pension system

Projection of future obligations

An essential aspect of actuarial valuation is the estimation of future pension payment obligations. This involves calculating the present value of all pension benefits

that will be paid to participants in the scheme, taking into account life expectancy, retirement age and other relevant variables.

Projection of future income

In parallel [1], actuaries estimate the future income of the pension system, based on current and future contributions from employees and employers. This involves analyzing the employment rate, wages and other economic factors that influence the contribution base.

Sensitivity testing

A critical part of actuarial valuation is testing the sensitivity of projections to changes in key assumptions. For example, how would a change in the birth rate, life expectancy, or employment rate affect the financial balance of the pension system?

2.3. The importance of actuarial balance

The actuarial balance of a pension system is essential to ensure its long-term sustainability. An unbalanced system can lead to financial deficits, requiring external interventions, such as government subsidies or adjustments to benefits and contributions. Maintaining a healthy actuarial balance ensures that the pension system can meet its obligations to beneficiaries without compromising financial stability.

2.4. Evaluation methodology

Like any research concept, this one assumes a certain evaluation methodology which, in our opinion, refers to:

•Demographic projections: These are carried out based on historical data and future scenarios, in order to estimate the evolution of the active population and pensioners.

•Calculation of financial flows: Since it is a matter of considerable expenses to support the pension system, the contributions collected, pension expenses and other elements that influence the financial balance are analyzed.

•Sensitivity analysis: In this regard, certain factors that influence the system are taken into account so that the impact of variations in parameters (for example, changes in life expectancy or contribution rate) on the sustainability of the system is evaluated.

Starting from the general concepts we previously discussed, we will see that we can identify, in the case of Romania, the same pertinent evaluation methods that are related to this system.

2.5. The legislative framework of the pension system in Romania

This framework, as we mentioned, is given by Law No. 360/2023 on the public pension system [2].

This law is the basic normative document that regulates the functioning of the public pension system. It establishes the calculation principles, the rights and obligations of contributors, as well as the framework for actuarial assessments. Over the years, this law has undergone amendments and adaptations to reflect new demographic and economic realities.

We have seen that actuarial valuation is the mathematical and statistical analysis of the financial flows of the pension system, with the aim of determining whether the income (contributions of current employees) is sufficient to cover future expenses (payment of pensions).

This valuation involves the use of mathematical models to estimate key variables such as demographic evolution, life expectancy and economic dynamics, and to determine the “actuarial value” – that is, the ratio between available funds and future obligations.

2.6. The importance of a constantly updated and adapted legislative framework

This framework requires permanent adaptations and modifications to adjust the sustainability of the Romanian pension system to the daily challenges it faces. In this context, we identify the following benchmarks:

•Adaptability: Legislative changes aim to adapt the pension system to demographic and economic changes, by constantly updating the parameters used in actuarial valuations.

•Transparency and accountability: Legislation requires transparency in the calculation and reporting of actuarial values, which is essential to inform the public and to inform political decisions on pension system reforms.

•Sustainability: Actuarial valuations are fundamental for establishing system adjustment measures, such as changing the retirement age or contribution rates, to ensure the long-term financial viability of the system.

2.7. Challenges and prospects

Current challenges

•Population aging: Declining birth rates and increasing life expectancy put pressure on the balance of the pension system.

•Labor migration: The reduction in the contributory base affects the system's revenues.

•Economic volatility: Changes in the economic environment can affect the collection of contributions and the system's ability to pay pensions.

Future prospects

•Modernization of actuarial methodologies: Implementation of more sophisticated mathematical models, adapted to the new economic and demographic realities.

•Legislative reforms: Continuous adjustment of the norms, including Law no. 360/2023, to maintain the financial balance of the pension system.

•Integration of funding sources: Diversification of the financing of the system (including through private pension funds) to reduce pressure on the PAYG system.

2.8. Conclusions

The actuarial assessment and updating of the balance of the pension system in Romania are crucial tools for ensuring its sustainability. The legislative framework, dominated by Law no. 360/2023 and complementary regulations, establishes the basis for determining the actuarial value, and the mathematical and statistical methods used allow for the rigorous analysis of financial flows. In the context of current demographic and economic challenges, continuous adaptation of parameters and legislative reforms are imperative to ensure a fair and viable pension system in the long term.

3. Regulation of the principle of actuarial assessment and updating of the balance of the pension system for European civil servants [3]

According to the Statute for European Civil Servants, in Annex XII Chapter 1, there is talk of a principle that results directly from the wording of the chapter and indirectly from its content. It is about "The principle of actuarial assessment and updating of the balance of the pension system".

Thus, starting with 2004, the European Commission effects, once every five years, the balance of the pension system in order to establish the contribution of European civil servants to the pension system and to see if this contribution is sufficient to finance at least one third of the cost of the system. Therefore, the Commission annually updates this contribution according to several criteria, namely:

-demographic evolution;

-interest rate;

-annual variation coefficient of the European civil servant salary scale.

The evaluation and updating is carried out for each year based on the number of active members of the pension system on December 31 of the previous year.

Any update of the contribution rate shall take effect from 1 July, at the same time as the annual update of remuneration pursuant to Article 65 of the Staff Regulations. Updates may not result in the contribution being increased or decreased by more than one percentage point compared with the rate applied in the previous year. The difference between the update of the contribution rate resulting from the actuarial calculation and the update resulting from the abovementioned variation shall never be recovered and shall therefore not be taken into account in subsequent actuarial calculations.

Actuarial valuations are carried out every five years and establish the equilibrium conditions that take into account, within the pension system's expenses:

- old-age pension;

-disability allowance;

- survivors' pensions.

The actuarial value of pension rights acquired before the calculation date represents the obligations corresponding to previous periods of employment, while the actuarial value of pension rights that will be acquired during the year of activity starting on the calculation date represents the service cost.

By assumption, all retirements (excluding invalidity) will take place at a given average age. The average retirement age is updated only on the occasion of the actuarial review, carried out every five years, and is not necessarily the same for all categories of staff.

When establishing the actuarial values:

(a) account shall be taken of the subsequent evolution of each official's basic salary between the date of the calculation and the theoretical retirement age;

(b) pension rights acquired before the date of the calculation (obligations corresponding to previous periods of employment) shall not be taken into account.

An adjustment procedure is applied to determine the real discount rate and the annual coefficient of variation of the salary scales of officials of the European Union. This is obtained using a 30-year moving average of the interest rate and the salary scale increase.

Conclusions

The principle of actuarial assessment of the balance of the pension system is crucial for ensuring its sustainability and solvency at the level of the European civil service. Through detailed demographic and financial projections, sensitivity analysis and continuous monitoring, the European pension system can be adjusted to meet future challenges. Implementing proactive policies and structural reforms based on rigorous actuarial assessments can significantly contribute to the stability and fairness of pension systems.

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