

Equity in the Focus of the Public Pension System

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Abstract

The pension system is one of the most important elements of social protection in any country. It must be structured to pursue fairness - overcoming poverty among the elderly and striving to preserve to a large extent the consumer power of individuals before and after retirement. Therefore, the purpose of this article is to highlight the challenges to achieving fairness in the public pension system and to look for options for its reorganization in a way that most fully corresponds to the set goals in a long-term aspect. The positive and negative features of variants of reforms carried out are examined and the advantages of applying an endogenous pension system based on the Notional defined contribution scheme are put forward.

Keywords: Pay-As-You-Go System, Defined Benefit, Defined Contributions, Intragenerational Equity, Intergenerational Equity, Notional defined contribution scheme

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Introduction

The pension system is one of the most important elements of social protection in any country. Its organizational and legal form is determined by the state of the economy and the labor market, the implemented tax policy and income policy, the demographic situation, the development of financial relations, including insurance, and the specific model of pension insurance adopted by society. In order to achieve efficiency and fairness in the pension system, it must guarantee the necessary subsistence minimum of the elderly without disturbing the economic and social positions in the initial income distribution.

By its very nature, the pension replaces the salary as the main source of income for workers and employees when, due to old age or deterioration of their health, they lose the ability to work to their full potential. In this sense, it is also defined as an alimony covering the necessary or expected means of support (Andreeva & Yolova, 2020). It is this fact that determines the importance of the existence of pension insurance systems. However, the aging of the population presents European governments (and many other governments around the world) with serious challenges to financially balance public pension systems and provide the necessary funds to support the elderly now and in the future (Blagoycheva, 2014). According to the forecasts of the European Commission set out in The 2021 Aging Report, the ratio of pensioners / workers will undergo a serious increase. If in 2020 the Old-age dependency ratio (65+/20-64) averaged 35.2% for the EU, in 2070 it is expected to reach 62.5% (EC, 2021, p. 28). Therefore, in the last few decades, the interest in the fairness of pension systems has been one of the main motivations for pension reforms, so as to achieve an optimal combination of social justice and economic efficiency, combined with resistance to the expected demographic changes. Many countries (including Bulgaria) tried to find a solution by combining Public Pay-as-you-go (PAYG) Systems with Defined Benefit (DB) Schemes with Private Fully Funded (FF) Systems with Defined Contributions (DC) Schemes¹. Each of them has its leading goals, depending on the achieved economic development and social policy. Increasingly serious intergenerational income redistribution has prompted critics of PAYG systems to warn that future generations will have to bear an unfairly heavy burden and seek equity in DC schemes, taking advantage of the investment opportunities and higher returns of the private sector. At the

¹ Obviously, there can also be combinations between the elements – for example, private offering of defined benefit schemes. Such are the pension products offered by insurance companies. However, they are not of a mass nature, and are outside the social security system, which is why they are not the subject of consideration in this article.

same time, DC schemes, due to the individual nature of social security, do not contribute to poverty alleviation.

Moreover, the creation of the pension policy itself must be aligned with many external factors: the level of economic development of the respective country, administrative and political organization and fiscal restrictions. Similar trends are not alien to the national pension system, which is emerging as flexible, dynamic and adequate to social attitudes and understandings and undergoing significant changes, both in terms of receiving contributory pensions and considering non-contributory pension payments (Yolova, 2016). Therefore, fairness cannot be considered in isolation from all these limitations. The necessary compromises that have to be made may harm the possibilities of achieving the most expedient option that satisfies the stated objectives. All this confronts politicians with difficult decisions to find the compromise between the redistributive nature of public pension systems and the preservation of fiscal sustainability.

Therefore, the purpose of this article is to highlight the challenges to achieving fairness in the public pension system and to look for options for its reorganization in a way that most fully corresponds to the set goals in a long-term aspect.

To realize this goal, general scientific methods of knowledge such as analysis, abstraction, axiomatics, analogy, induction and deduction have been used. The literature examined includes books and articles published in major international scientific journals, reports and analyzes of the European Commission and the International Monetary Fund, and the Eurostat database. To find the sources, the databases of E-library, Emerald Insight, Google Scholar, ResearchGate, RePEc, Scopus, Web of Science have been used.

1. The discussion about the fairness of the public pension systems

Depending on the established principle of organization, pension systems can be considered as Pay-as-you-go financed or fully funded, with Defined Benefit or Defined Contributions. Historically, PAYG systems were the first to be applied to cover insurance risks. Their concept was created on the Bismarckian model as early as 1889. They pay benefits from contributions collected on the labor income of the employed and are a typical example of making substantial intergenerational and intragenerational transfers. In FF systems, the accumulated capital of the individuals' personal accounts in the relevant pension fund is used to finance the insurance payments. Due to the individual nature of the social security, the principle of solidarity is absent and there is no redistribution between different individuals or groups of the population. In both options, there is a strong link between the contributions and the pensions paid. In private FF systems, contributions are actuarially linked to the potential value (taking into account individual risk and life expectancy) of benefits. In PAYG benefit calculation systems, length of service and earned income are taken into account, but here risks are pooled across the entire insurance pool.

Defined Benefit schemes are usually implemented with PAYG systems. In their case, the risk of not having enough funds for adequate pensions is transferred to the next generations. With Defined Contribution schemes, this risk is borne by the insured person himself, because his pension payments are a function of the amount of insurance contributions and the net return achieved on their investment.

Although there are different models for financing pension payments among European countries, the public Pay-As-You-Go System is still prevalent. It is a manifestation of social solidarity by pooling risks. Pensions are financed through insurance contributions, which are a certain percentage of the realized income of working persons. These pensions are also combined with tax-funded universal benefits, most commonly old-age or disability welfare payments. These universal benefits are not tied to insurance contributions or length of service, but only to the current income status of the pensioner and the pensioner's needs. As such, they are better suited to poverty alleviation. Although both goals (maintaining income levels and reducing poverty) should be pursued, in many cases it is difficult to achieve them simultaneously and this may force

governments to look for different combinations (or even partial or complete abandonment of one goal) depending on what their pension policy pursues. One of the options is for the public pension system to be aimed at preserving the income level, and for poverty alleviation to be delegated to the social assistance system, which is outside the pension system. Alternatively, in the presence of more than one functioning system, the preservation of consumer capacity before and after retirement can be enhanced through private FF systems.

Although both goals must be pursued, the question arises of how we can define equity. According to Kaplow (2000, p. 22) “equity should not be measured and new measures of social welfare should not be deployed until we know what we want to measure and why.” Therefore, perhaps we should start from the initial question, namely how strong should the connection between the insurance contributions and the paid pensions be. The main prerequisite for receiving a pension is the length of service, which in some way reflects the life path of a person, influenced by their family background, education, employment history, gender, state of health and to some extent - personal luck. Then the question arises: „How well should welfare, late in life, correlate with what happened during an individual’s active years?“ (Clements, Eich & Gupta, 2014, p. 8). We can say that the system will be economically fair if it ties pension income to the distribution of working-age income. However, thus it will be discriminatory towards persons with low incomes, i.e. social justice must also be sought. Along these lines Falk (1993, p. 2) believes that „there are some things which people should have, that there are basic needs that should be fulfilled . . . and that burdens and rewards should not be spread too divergently across the community”. And this can be achieved through the flat, tax-funded universal pension. It redistributes funds and provides protection to people with low incomes and insufficient pension rights. That is why the participation of the state in the pension system is determined by the need to combine the risk of longevity with the redistribution of income and the burden of risks. Therefore, to be fair, a pension should on the one hand prevent poverty in old age and on the other hand limit the difference in an individual's consumption power before and after retirement, which are the objectives of the public pension system with DB schemes. These two approaches are presented by Clements et al. (2015) through the concepts of vertical and horizontal equity (Table 1).

Table 1. Factors of Equity in Public Pension Systems

| | Horizontal Equity | Vertical Equity |
|---------------------------------|---|---|
| Intragenerational Equity | Strong contribution-benefit link along the entire income distribution; uniform internal rate of return within cohorts | Contribution-benefit link weak for low-income scheme members; internal rate of return negatively correlated with contribution performance |
| Intergenerational Equity | Same relationship between lifetime contributions and benefits for subsequent cohorts; uniform rate of return for subsequent cohorts | Internal rates of return negatively correlated with affluence; better-off generations receive lower relative benefits and may reduce underfunding |

Source: Clements et al. (2015, p. 280)

Both concepts can be considered within a generation, as well as in terms of intergenerational redistribution.

Horizontal equity within a generation would require that the same contributions yield the same pensions, ie ensuring a corresponding proportional rate of return. On the other hand, vertical equity will require pension payments tailored to the needs of individuals. Then "adjusted for life expectancy, a uniform internal rate of return in the income distribution is horizontally equitable, while vertical equity requires internal rates of return that are differentiated by income or other characteristics" (Clements et al., 2015, p. 279-280).

Horizontal equity is more pronounced in Defined Contributions schemes. Although they can also be used with PAYG systems, they are more common with FF systems. They do not use redistribution between individuals within a generation. Since DC schemes are characterized by a fully proportional rate of return, their design can be said to be perfectly fair from an interpersonal point of view. At the same time, however, their application is in opposition to the requirements of vertical justice. They not only cannot contribute to the reduction of poverty, but even contribute to its deepening among pensioners. This situation is particularly problematic in low-income countries with a large informal economy. Some of the persons will remain without access to the system, and others, due to their low incomes, will receive pension payments that will be grossly insufficient for the necessary standard of living. Therefore, DC schemes may need to be supplemented with public social transfers to reduce pensioner poverty.

In contrast, Defined Benefit schemes allow more redistribution, since they lack available financial assets. Pensions are calculated using a formula that takes into account length of service, income and contributions to the public pension system. The “price” at which past contributions buy retirement benefits is set by the legislature at the time of retirement and with as much regard for horizontal and vertical equity as social policy objectives require (Clements et al., 2015, p. 284). In this way, part of the funds accumulated in the public pension fund are redistributed to persons with lower incomes. Therefore, the joint implementation of DB schemes and public schemes with universal coverage is an expression of vertical equity within one generation.

The fairness of the pension system, considered between generations, is related to the fair distribution of the internal rate of return between the different generations. However, different interpretations may arise here, and the question is how to distribute the costs of maintaining the sustainability of public pension systems between different generations, so that this distribution is fair? If the burden of paying higher pensions is shifted forward to the next generations, it would be unfair to them, given that the return on their contributions would subsequently be reduced. If the contributions of the next generations do not increase, this will limit the means of paying pensions and will transfer the burden of the restrictions to the pensioners. It is clear that the choices that governments must make will resemble a zero-balance conflict in which the benefits of one generation must be sacrificed to maintain the incomes of the other (Bosworth & Burtless, 2003).

But if we follow the logic of economic growth and count on subsequent generations having higher incomes, it would be fair to shift a heavier burden to them. The reduced internal rate of return realized by subsequent generations can be seen as a search for intergenerational vertical equity. The search for horizontal equity, in turn, would require all generations to bear the same insurance burden, ie. the part of their income accumulated in the public pension fund should remain stable. As a benchmark for horizontal justice we can use the example presented by Oksanen (2002, p. 21): „ in a mature DB pure PAYG system under a stationary (or steadily changing) population, all successive generations pay an equal percentage of wages to pensions and also receive a pension fixed as an equal percentage of the wage rate. Thus, there is no redistribution of income across generations in a real sense.“

Finally, as a summary of the achievement of equity, two policy constraints should be noted. First of all, to fulfill the objective of social policy, the pensions received must be sufficient to protect the elderly from poverty. Second, to support horizontal equity, there should be no disincentives to participate in contributory and voluntary old-age savings schemes.

2. The challenges to achieving fairness

Population aging is changing the terms of the 'implicit intergenerational contract' that underpins PAYG DB pension schemes (House, 2004, p. 7). PAYG systems can also be seen as an informal contract. Public pension PAYG systems have the so-called state guarantee because of promised pension rights (Blagoycheva & Todorova, 2012). Workers contribute part of their income to support pensioners, but receive in return the state's promise that when they retire, they will also

be supported by the then workers. However, due to declining birth rates and increased life expectancy, subsequent generations will be fewer in number and will live longer. Then, to cover the higher aggregate pension costs, each successive generation will pay higher contributions and receive a lower rate of return in retirement.

Is this a sufficient argument, when seeking fairness, to replace the public PAYG system with the private FF system? FF systems are considered to offer better rates of return and increase aggregate savings (Feldstein, 2001). But they are highly vulnerable to economic crises and turmoil in the capital markets. At the same time, they are also subject to the problem of an aging population and this was elaborated in a report on pensions by the International Labor Office (Gillion et al, 2000). Even Dumont (2020, p. 15) points out that the age pyramid, meaning a rise in dependency levels in old age, undermines any pension system, whether it is expensed or funded.

The fact that FF pension systems do not involve intergenerational redistribution does not mean that they do not involve any intergenerational inequality. The funds of the individual lots of the persons insured in private funds are invested in search of a higher yield. Volatility in financial markets can also reduce the rate of return received by different generations on their contributions to investment funds. In this regard, we can make the generalization that certain types of capricious distributional effects are eliminated by the shift from a DB to a DC plan, but others are created (James, 1997).

Where does that leave the question of intergenerational justice? It is obvious that this problem cannot be solved by replacing PAYG pension systems with FF systems. Therefore, the reforms of the end of the 20th century and the beginning of the 21st century were aimed at partial privatization of public pension schemes and combining PAYG with FF systems for sharing the risk in the system (in Bulgaria, Croatia, Hungary, Poland, Romania and other Eastern European countries). The introduction of mandatory, privately managed defined contribution schemes increased the overall horizontal fairness of pension payments by strengthening the link between contributions and future earnings. At the same time, however, this reform limited vertical justice. Individuals with short contribution history and low labor income faced low pension benefits and the risk of poverty in old age. Moreover, contributions to private funds diverted some of the funds previously paid into the public pension system and created an additional deficit, the burden of which will again be borne by future generations.

Ultimately, pension transfers should transfer purchasing power from working people to those already out of the workforce. But in order to cover the rising costs of pension provision, the main challenge is to maintain a dynamic and growing economy. It is not by chance that Willetts (2003) forecasts that the problems that societies will face will not be savings, but the volume of production and the generation of sufficient income in the context of an aging society. It is precisely the pace of economic growth that politicians should focus their attention on in order to be able to deal with social goals as well. In order to achieve sustainability and equity in pension reforms, a holistic approach must be introduced where reformers focus on both the objectives and the constraints of the system (Grech, 2018), with particular attention to resource security and stability of the public pension system.

Since the public pension system is called upon to play a leading role in the fair redistribution of resources, special attention is needed to its financial security and long-term sustainability. Moreover, for its material provision, a part of the necessary product is set aside, which was, in principle, intended to cover the maintenance of the reproduction of the labor force. On the one hand, it can be assumed that the share of funds used for this purpose in the structure of the gross domestic product is a macroeconomic indicator of the level of civilization of the society. But on the other hand, it is also an indicator of the sustainability of public finances. Too large a share can cause unsustainability by crowding out other important government spending (health, education, capital spending) or by requiring increased taxes (which impacts unfavourably consumer spending). And the data shows that the aging population and the increase in the standard of living require an ever

higher share of GDP to be set aside (Table 2). On average for the EU 27, the share of pension costs as a share of GDP for the last 10 years ranges from 12.8% to 13.7%.

Table 2. Expenditure on pensions as a share of GDP in EU countries (in %)

| | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|--------------------------------------|------|------|------|------|------|------|------|------|------|------|------|
| EU - 27 countries (from 2020) | 12,8 | 12,8 | 13,0 | 13,3 | 13,2 | 13,1 | 13,0 | 12,8 | 12,7 | 12,7 | 13,7 |
| Belgium | 11,8 | 12,0 | 11,9 | 12,3 | 12,3 | 12,5 | 12,3 | 12,4 | 12,6 | 12,6 | 13,7 |
| Bulgaria | 8,7 | 8,1 | 8,0 | 8,6 | 8,7 | 8,5 | 8,3 | 8,0 | 7,8 | 7,5 | 8,1 |
| Czechia | 8,8 | 9,1 | 9,3 | 9,2 | 8,9 | 8,6 | 8,4 | 8,2 | 8,1 | 8,3 | 9,3 |
| Denmark | 12,6 | 12,8 | 12,7 | 13,7 | 14,0 | 13,5 | 12,6 | 12,6 | 12,5 | 12,6 | 12,8 |
| Germany | 12,4 | 11,9 | 11,9 | 11,8 | 11,7 | 11,8 | 11,8 | 11,7 | 11,8 | 11,9 | 12,8 |
| Estonia | 8,7 | 7,8 | 7,6 | 7,6 | 7,5 | 8,0 | 7,9 | 7,6 | 7,7 | 7,8 | 8,9 |
| Ireland | 8,1 | 7,9 | 8,2 | 8,1 | 7,6 | 5,8 | 5,7 | 5,6 | 5,2 | 5,1 | 5,0 |
| Greece | 14,9 | 16,7 | 17,9 | 16,8 | 17,3 | 17,8 | 17,7 | 16,8 | 16,2 | 16,1 | 17,8 |
| Spain | 10,6 | 11,1 | 11,9 | 12,6 | 12,8 | 12,7 | 12,6 | 12,4 | 12,6 | 12,7 | 14,5 |
| France | 14,4 | 14,5 | 14,8 | 15,1 | 15,1 | 15,1 | 15,1 | 14,9 | 14,9 | 14,7 | 15,9 |
| Croatia | 10,4 | 10,2 | 10,5 | 10,7 | 10,8 | 10,6 | 10,3 | 10,1 | 10,0 | 9,9 | 11,1 |
| Italy | 15,4 | 15,4 | 16,0 | 16,5 | 16,4 | 16,4 | 16,0 | 15,8 | 15,8 | 15,9 | 17,7 |
| Cyprus | 7,1 | 7,5 | 8,2 | 9,3 | 10,0 | 10,1 | 9,8 | 9,4 | 9,1 | 8,8 | 9,6 |
| Latvia | 10,1 | 8,9 | 8,2 | 8,2 | 7,9 | 7,7 | 7,5 | 7,4 | 7,4 | 7,5 | 8,4 |
| Lithuania | 8,4 | 7,6 | 7,6 | 7,2 | 7,0 | 6,8 | 6,8 | 6,7 | 7,0 | 7,0 | 7,5 |
| Luxembourg | 8,6 | 8,9 | 9,0 | 9,0 | 9,0 | 9,0 | 9,0 | 9,3 | 9,4 | 9,6 | 10,1 |
| Hungary | 10,6 | 10,7 | 9,3 | 9,4 | 8,9 | 8,5 | 8,4 | 8,0 | 7,6 | 7,3 | 7,5 |
| Malta | 9,1 | 8,9 | 9,0 | 8,5 | 8,0 | 7,2 | 7,3 | 6,8 | 6,5 | 6,2 | 7,1 |
| Netherlands | 12,2 | 12,5 | 12,9 | 13,1 | 13,2 | 13,0 | 13,0 | 12,5 | 12,2 | 12,0 | 12,7 |
| Austria | 14,5 | 14,2 | 14,4 | 14,7 | 14,8 | 14,6 | 14,3 | 14,1 | 13,9 | 14,1 | 15,4 |
| Poland | 11,8 | 11,3 | 11,6 | 11,9 | 11,8 | 11,6 | 11,4 | 10,9 | 11,0 | 10,9 | 11,4 |
| Portugal | 13,7 | 14,4 | 14,5 | 15,7 | 15,6 | 14,9 | 14,6 | 14,2 | 13,8 | 13,7 | 15,0 |
| Romania | 9,4 | 9,2 | 8,7 | 8,3 | 8,2 | 8,1 | 7,9 | 8,0 | 7,9 | 7,8 | 9,0 |
| Slovenia | 11,0 | 11,2 | 11,3 | 11,5 | 11,2 | 10,9 | 10,6 | 10,1 | 9,8 | 9,6 | 10,6 |
| Slovakia | 8,1 | 8,0 | 8,2 | 8,4 | 8,7 | 8,5 | 8,5 | 8,5 | 8,4 | 8,3 | 8,9 |
| Finland | 12,1 | 11,9 | 12,4 | 12,9 | 13,3 | 13,2 | 13,4 | 13,3 | 13,3 | 13,3 | 13,9 |
| Sweden | 11,4 | 11,2 | 11,6 | 12,0 | 11,6 | 11,2 | 11,3 | 11,2 | 10,9 | 10,7 | 11,2 |

Source: Eurostat

Although in some countries pension costs reduce their share in GDP (Ireland, Malta, Hungary, Bulgaria), growth is reported in almost all member states, and in Italy and Greece this share reaches almost 18%. And according to some authors, the level of public spending on pensions, as a share of GDP, is already approaching the limits of political acceptability and economic efficiency (Jackson, 2003).

Therefore, governments must be ready to compromise in the implementation of pension policy and its manifestations of fairness. The pursuit of adequate pensions for all may lead to excessive spending that disturbs the fiscal balance. Diminishing returns to higher-income earners and reallocating resources to lower-income earners would be consistent with vertical equity, but may weaken the incentives of higher-income groups to contribute. Shifting more provision to private FF pension systems will increase horizontal fairness and reduce the burden on the public PAYG system, but in the event of economic shocks, it will shift the risk to the beneficiaries of social security. Obviously, in striving for fairness, all these trade-offs must be carefully considered.

If the public PAYG system is unable to cope on its own, it will rely on subsidies from the state budget, which means higher taxes and a reduction in other public spending. In this way, pension schemes can influence individuals' behavior in relation to tax compliance, savings

opportunities, labor supply and income concealment. The latter is particularly strong for low-income countries where the informal economy is more widespread. Bulgaria in particular, being the country with the lowest incomes in the EU, faces many additional problems - low pension coverage, pension schemes relying heavily on budget transfers or promises leading to large pension deficits.

All this shows that the problems related to achieving fairness do not end with the fact that population aging causes unsustainability of public pension systems. The more serious problem is that governments are limited in their ability to take lateral measures to stabilize their sustainability by increasing pension contributions and taxes. They are faced with the difficult task of guaranteeing an adequate income for future pensioners, taking into account all these restrictions.

3. Possible approaches to preserving fairness

To achieve sustainability and fairness of pension systems, several measures can be considered to be useful in developing the policy line. The first step towards achieving equity is to ensure the financial stability of pension systems. In order to assess measures in this direction, it is necessary for individual countries to take into account forecasts for three components: the future number of pensioners, the expected average number of years spent in retirement, and the number of employed persons who will create the pension wealth. In this regard, Dumont (2020, p. 14-15) considers four main approaches to stabilize pension systems in the EU: i) compressing or reducing the financial value of pensions paid to pensioners; ii) higher contributions to PAYG schemes, or lower interest and dividends paid on individual capitalization accounts); iii) increasing the size of the active working-age population; iv) public borrowing to finance pensions.

After the 2008 financial crisis, some European countries did resort to pension cuts ². However, such a decision can be considered unfair, especially in relation to pensioners who, by raising their children, have contributed to their current economic status. In addition, the mechanical reduction of pensioners' incomes not only reduces their consumption power, but also creates negative attitudes among them.

Increasing insurance contributions means reducing the purchasing power of working people, their ability to reproduce (raise children) and limiting the opportunities to invest in business. In addition, it is not very clear whether this measure will lead to a serious increase in revenues in the public pension system, or vice versa - it will push individuals and incomes to the gray economy.

Increasing the active population can be achieved in several ways: by increasing the retirement age and keeping people in work longer; creating prerequisites for economic growth, which will reduce unemployment; taking measures to stimulate the birth rate so as to increase the labor force subsequently.

The increase in the retirement age is due to increased life expectancy. At the same time, the development of technology and health care contribute to better health and the longer preservation of working capacity. And it can be considered that due to the increased role of education, a large part of young people enter the labor market later. All this is also combined with the important reason for improving the financial stability of the system by avoiding longer pension payments and a greater resource of contributions paid.

Within this third approach, to achieve intergenerational justice, Europe needs demographic dynamics, i.e. it needs a family policy to stimulate increased birth rates. Countries devoting more resources to family benefits also have higher birth rates (Fent, Aparicio Diaz & Prskawetz, 2013). On the other hand, countries with poor family policies have lower birth rates. Family policy is a prerequisite both for future intergenerational justice and as an investment in human resources, both in the short term, from the dynamics that accompany it, and in the long term, from its effects on the potential of the labor force.

Financing the pension system through public borrowing will have a beneficial effect in the

² Sweden, Portugal, the Baltic States, Cyprus, Greece, Hungary and Romania.

short term, but it is not really a desirable measure, as it will subsequently manifest itself as a greater financial burden for future generations of workers and taxpayers.

Much of the resources of these measures (increasing contributions, delaying retirement, increasing the activity rate, transferring responsibility for social security, etc.) have already been used. One of the most active reforms is raising the retirement age, and it is paying off. The activity rate among the 55-65 age cohort, especially women, has risen by 10 points, while the average effective retirement age has risen by 2 years since 1990 (but is set to rise by another 4 years to 2070) (ISSA, 2022).

Raising the retirement age increases the intergenerational redistribution of retirement wealth. At the same time, longer working experience will contribute to higher pensions in the future. However, this will not apply equally to all beneficiaries of the system. More educated people can more easily secure a job at a later age, and their higher earnings will lead to a higher pension. In addition, people with lower education, due to harder working conditions, may also have a lower life expectancy after retirement, so that they do not use all their pension rights. Raising the retirement age should therefore be accompanied by a range of policies and measures to ensure initial and continuing training that improve the productivity of older workers and regulations that reduce age discrimination and allow flexible working conditions (Heywood and Siebert, 2009).

And finally, a good option for solving a large part of the problems is the implementation of a pension system with a Notional defined contribution (NDC) scheme. NDC schemes are not new to pension practice. They have been successfully implemented since the mid-1990s in several European countries such as Italy, Latvia, Norway, Poland and Sweden (Chłoń-Domińczak et al., 2012). They are also found in Kyrgyzstan, Mongolia, Russia, Greece and Egypt (Holzmann, 2017). But, despite their many advantages, they are not yet widely used in the countries having the greatest difficulties with the PAYG systems.

An effective pension system can be built on the basis of the NDC scheme. As the public pension system currently best addresses intra- and intergenerational pension equity, it is obvious that it should be a modified PAYG system. To be effective, the system should be built in a way that makes it endogenous. This means that it automatically adapts to changes, without outside intervention, through a built-in internal stabilizer. The only intervention is the initial selection of the percentage of the social security contribution.

The endogenous system represents an automatic adjustment of the pension market supply to a given demand. This is actually a theoretical equivalent of a PAYG system in terms of permanent rules and a sustainable demographic structure (something that, in practice, does not exist). The endogenous system leads to a situation where the share of GDP allocated to the retired generation is stable over time. Nowadays, this is an especially important feature. It helps to avoid the over-indebtedness of the pension systems, and from there – the problems of the labor markets and the slowdown of economic growth.

NDC schemes are accounting techniques that treat the cost cap system as a defined contribution system. The model is based on the personal social security contributions, which, however, are accumulated in individual lots maintained by the social security institutions. The balance sheet as a whole is fictitious, abstract and conditional as no capital is actually accumulated. The accumulated amount represents fictitious pension wealth. The pension balance is compounded at a certain percentage and thus provides a return. Since no capital is accumulated on the balance sheet and the funds are not traded on the financial markets, it has no market mechanism to determine the rate of return. From a macroeconomic point of view, the rate of return under such a scheme is the implicit return under the cost recovery model, which is the growth of the sum of all collected social security contributions. When individuals reach retirement age, the realized abstract pension wealth is converted into lifetime payments. They are annuity payments and are determined based on accepted actuarial calculation rules.

Automatic recalculation mechanisms in NDC schemes are formula-based arrangements that

automatically recalculate pension payments (without further government regulatory intervention) to keep pension costs within the income or expenditure target framework. These recalculations differ significantly from traditional inflation indexing, which aims at budgetary control rather than pension adequacy. It may be objected that, in this way, the system with a built-in automatic stabilizer leads to a reduction in pensions expressed in terms of the replacement rate. But given the impossibility of increasing contributions and/or taxes above current (already too high) levels, pension generosity in the replacement rate will depend only on processes in the demographic structure, i.e. the earlier an individual retires, the lower the conversion of these contributions into a monthly pension (Castanheira & Galasso, 2003). Both FF pension systems and NDC schemes are actuarially fair (De Callataÿ, 2011), which ensures that the pension system will remain balanced in the long term, as pension benefits are directly linked to contributions. And because of the similarity with DC schemes, installment payments are perceived less as a general tax on wages and more as savings for one's own pension (Oksanen, 2001, p. 12). The availability of information on the accumulated amount and added return is another plus point of the NDC scheme in this regard. Considering all the advantages listed so far, NDC schemes can be a good solution to fix unstable PAYG systems.

Conclusion

The role of the pension system is to provide pension rights to the insured individuals, while at the same time redistributing resources within a given generation from the rich to the poor. Therefore, to be equitable, a pension should on the one hand prevent poverty in old age and on the other hand limit the difference in an individual's consumption capacity before and after retirement, which are the objectives of the public pension system with DB schemes.

The controversial moments in relation to the manifestations of equity show that currently there are still various fiscal, administrative and income constraints that do not allow the formation of a best option and force governments to seek compromises between horizontal and vertical justice when creating their pensions policies.

Despite the various parametric and structural pension reforms carried out in European countries over the last 25 years, problems related to the aging population still continue to affect the long-term financial sustainability of pension systems. An additional problem is that governments are limited in their ability to take lateral measures to stabilize their sustainability by increasing pension contributions and taxes. They are faced with the difficult task of guaranteeing an adequate income for future pensioners, taking into account all these restrictions.

Therefore, as an alternative option, the advantages of applying an endogenous pension system based on a Notional defined contribution scheme with a built-in internal stabilizer, which ties the pension annuities to the life expectancy after retirement, are presented. In this way, NDC schemes can be a good solution to fix the unstable PAYG systems.

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