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Sustainability and Adequacy of Pension Systems: Importance of Innovative Risk Management

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ABSTRACT

In modern conditions, with an increase in the risk of poverty due to inadequate pension income, a responsible approach is necessary in terms of management in public and private pension systems. To maintain a decent standard of living for the elderly population, the rights of non-pension and adequate pension income have been defined. Pensions should be commensurate with contributions, it is necessary to provide equal opportunities for the acquisition of pension rights for women and men and to the means that create the conditions for a dignified life in old age. The goal of the work is to investigate the possibilities of adequate management by state authorities, employers of pension systems, individuals, and interested parties with the application of innovative approaches and gain insight into the best systems for implementation in practice. The subject of the work is the sustainability of the pension system, with the application of risk-free management principles. The method that will be applied is descriptive, and comparative with the scientific literature of electronic databases of scientific journals and international databases.

Keywords: Pension Systems, Sustainability, Risks, Management, Innovation, Technology, GPI, IRM.

INTRODUCTION:

Aging, which is a consequence of demographic changes in the birth rate and life expectancy, represents the main factor of changes in the pension policy. With the increase in life expectancy, it is necessary to ensure the well-being of current and future generations and provide the elderly population with adequate pension income. The main demographic indicators that influence the reforms and policy of pension systems are: the number of births per woman, changes in life expectancy, and the degree of aging - the number of people aged 65 and over compared to the number of people of working age (20-64) and the rate of employed older workers (WB, 2023).Expectations are that the most dramatic variant of aging in the world will be in low- and middle-income countries. Due to the problem related to individuals in the informal sector with informal income and the self-employed, who do not have a pension savings plan, additional options were analyzed in certain countries in Africa, Latin America, South Asia, and the Caribbean. For individuals who did not have a job or insurance, social pensions were introduced. They have been introduced for about 35% of the population aged 60 and over in OECD countries and in the regions of Europe and Central Asia, East Asia and the Pacific, Latin America, and the Caribbean and South Asia, which are the most

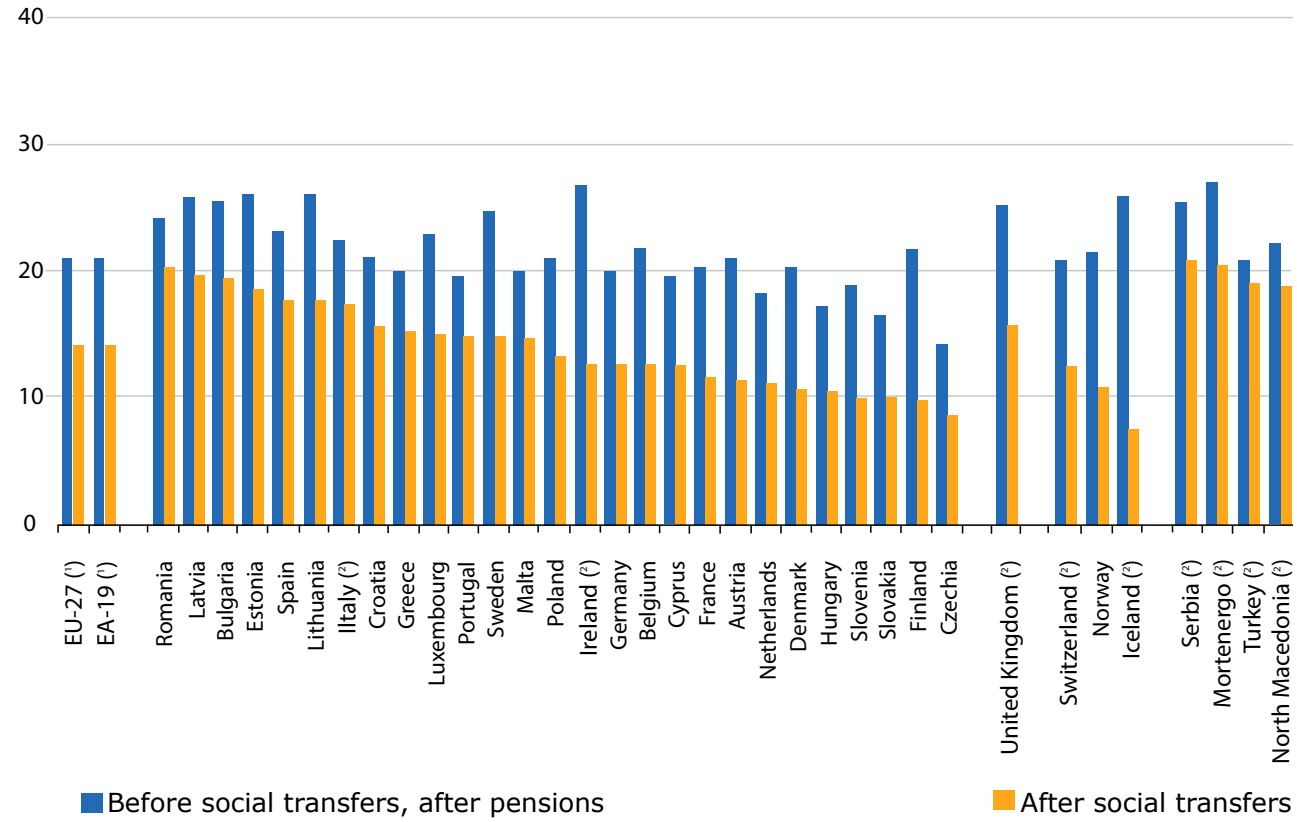
effecti e means of providing material support to the poor and elderly, with disabilities. However, in practice, the application of social pensions and their increase is disputed, due to fiscal restrictions (WB, 2023). Pape (2023) presented that the important social risks associated with the pension system are 1. the risk of unemployment and incapacity, 2. the risk of income insecurity, and 3. the risks of dementia or frailty that require assistance and health care. To achieve social protection and the welfare state, the European Commission analyzed megatrends such as: demographic changes, transformations in the labor market, and technological and green transitions. Based on the Pension Adequacy Report SPC (2021), recommendations were made that member states should be guided by the extension of working life in their pension policy, with the application of flexible options for gradual retirement at a later age, to ensure the adequacy of pensions to a greater extent in the upcoming period with the reform of the financing of the pension system (SPC, 2021). Sarfati and Ghellab (2012) stated that the problems of financial sustainability of the pension system are complex, have a long-term character, and affect future generations. From the economic aspect, the employment factor is particularly significant because the global economic crisis caused the employment rate to fall in several developed countries, especially in the United States of America, and caused a decrease in business activities, a decrease in income, and therefore labor costs were limited in terms of protection health at work. For this reason, the overarching goal is to achieve the adequacy of the pension system and define the lower poverty threshold of sustainable and inclusive macroeconomic development (Sarfati and Ghellab, 2012). The necessity of achieving a sustainable pension system and thus macroeconomic development is important in countries where the number of poor elderly individuals has been increasing for many years. This applies to many countries as well as the USA, where the number of poor people aged 65 and over increased so that in 2021, 10.3% of the elderly had an income below the poverty threshold, with 5.8 million poor people (Lee and Dalaker, 2022). According to EC (2015) and Djukic (2016), the broader context of pension adequacy implies a multidimensional approach. It does not take into account only the pension income according to the replacement rate, but the pension income is determined, with several aspects so that: 1. the pension income of the pensioner should be at the same level as the income at the time when the individuals or insured persons were active on the labor market, 2. the insured's contributions and their working life should be for as long as possible, and 3. pension incomes should be safe from the aspect of indexation, valorization, automatic mechanisms of reconciliation and that they should be free from any risks (EC, 2015; Djukic, 2016). Stewart (2022) pointed out that there are challenges for the government to protect the olderly population from poverty, disease, and disability to ensure that their lives and assets are sustainable in an inclusive and sustainable economy.The application of adequate social and pension insurance along with risk and investment management is important for positive effects on the diversification of the financial sector. The effe ts of better insurance were considered by Stewart and he came to the knowledge that adequate insurance means that the insured will not lack in the basic necessities of life nor will they be forced to expect help from friends, relatives or government/social institutions. Pension systems have a double effect because they not only provide the necessary income in old age but also contribute to long-term savings, which affects sustainable financing, greening the fina - cial system, and accelerating economic growth (Stewart, 2022). Djukic (2016) concluded that to reduce the poverty of pensioners in the unfunded pension PAYG system and to increase the level of social protection, it is necessary to modify the appropriate parameters of social, i.e. pension insurance. It is recommended that structural reforms be carried out in the macroeconomic environment in order to create conditions for the sustainable functioning of the pension system. The modification of social contributions would favor the alleviation of poverty and the protection of socially vulnerable elderly groups. Poverty reduction also depends on the employment rate in the labor market and the level of GDP, and productivity (Djukic, 2016).To increase the employment rate in the labor market, developing countries are increasingly relying on the SME sector for their economic growth and develop-

ment, following the lead of established countries (Ilic et al., 2024). Barr (2000) emphasized that to increase productivity, it is important to provide appropriate investment capital, to increase the quality of work with appropriate human capital. Political measures are necessary to increase the number of employees, raise the retirement age, and ensure the import of labor. Strengthening economic growth would have effects on the achievement of macroeconomic stability and on the long-term financial stability and sustainability of the pension system (Barr, 2000; Djukic, 2016).

Risk management in the pension system

The risks were pronounced around the world during and after the COVID-19 pandemic. Due to the emergence of inflation and the growth of interest rates, there was an increase in the national debt, and geopolitical uncertainty, which had risky consequences on pensioner incomes and the return on investments (CFA Institute, 2023). The biggest challenge facing organizations today is their ability to transform from isolation, closure, secrecy, and rigidity to overcome risks and become sustainable (Ilic et al., 2023). To achieve long-term sustainability, Sandberg et al. (2020) considered risk assessments and risk management during the research of pension plans and the public pension system. Pension plans represent a type of insurance that includes insurance against economic, demographic, and other behavioral risks to ensure adequate pension income. During the economic crisis, the level of total state revenues decreases due to the reduction of individual revenues from property taxes, trade turnover, and other revenues, which has negative consequences for pension incomes. For this reason, proactive risk management with the use of reliable risk information is needed for all interested parties. The framework risk management plan should contain fi e elements to create conditions for long-term sustainability: 1. identification of all participants, i.e. interested parties, 2. definition of objectives in the risk system, 3. analysis of budgetary risks, 4. assessment of realistic possibilities for risk mitigation and implementation activities to that end, and 5. providing feedback to all participants and stakeholders. It was emphasized that in the public pension system in mutual interactions, no party should have absolute responsibility for decision-making or risks and that individual competing interests should be subordinated to general interests. The main risks are: longevity risk, management risk, governance risk, financi g, and design benefits, where it is important to primarily manage with three levers: "benefit levels, contribution policy and investment policy" in such a way that risk management mediates the competing goals of interested parties (Sandberg et al., 2020). In addition to the risk in public pension systems, the most significant risk in private pension schemes is the reduced level of savings achieved to create an appropriate standard of living PPI (2023). In addition, significant risks are: 1. Investment risks that occur in a situation when investments do not generate the expected level of return during the accumulation period and when there is a reduction in pension income; 2. Inflation risks are reflected in the fact that pensioners are directly affected by inflation because, due to the increase in living costs, pension incomes do not increase in the same way in the same proportion as for the rest of the population; 3. Longevity risks that appear when, due to the increase in life expectancy and longevity of pensioners, there is a risk of being deprived of income due to insufficien budget funds (PPI, 2023). The risk of poverty represents the global and greatest risk for all pensioners. In the EU-27 region, a comparison was made in 2019 regarding the poverty risk rate before and after social transfers to assess the effecti eness of the social protection system. In countries where the percentage of the poverty rate has been increased, it indicates that it needs to be reduced to eliminate the risk of poverty. Stankovic et al. (2024), refer to the composite EEPSE green economy index for assessing the progress of developing economies in achieving the goals of sustainable development, where one of the SDGs (Sustainable Development Goals) is poverty reduction.

In the OECD region, the concept of relative poverty is used when comparing the poverty rate. Relative poverty is measured below the poverty threshold, which is 50% of the average, equivalent disposable income of an individual, measured in %. Poverty among those aged 65 and over was 14.2%, the OECD average, as the elderly had incomes below the median national equivalent disposable income threshold, which



Note: ranked on the rate after social transfers. (1) Estimates; (2) 2018; (3) Provisional.

Figure 1:
At-risk-of-poverty rate before and after social transfers, EU-27, 2019 (%)
Source: Eurostat database, 2020.

has increased over the years since retirement. As a result, the depth of poverty increased, which on average amounted to 23.1% of the relative poverty line (OECD, 2023). Based on available data, the highest rates of relative poverty for those over 65 were 40% in Korea, 30% in Estonia and Latvia, and 20% or more in Australia, Costa Rica, Japan, Lithuania, and the United States of America. In contrast to the highest rates, the Czech Republic, Denmark, France, Iceland, Luxembourg, and Norway had the lowest rates of relative poverty for those over 65, around 5% or less. Regarding the difference between the poverty rates of the elderly about the total population, the biggest difference is in Korea, because the poverty rate is 25% higher, followed by Estonia and Latvia. However, the smallest difference is in France, Greece, Luxembourg, Norway, and Spain, where the difference is 4% (OECD, 2023). According to EUROSTAT (2024) and EU-SILC survey, the risk of poverty (AROP) rate for pen-

At Risk of Poverty Rate for Pensioners		
Selected countries EU	**%**	**Reference December**
1. Estonia	55.00	2023
2. Latvia	46.50	2023
3. Croatia	29.20	2022
4. Bulgaria	23,20	2023
5. Cyprus	21.20	2022
6. Germany	18.20	2022
7. Romania	18.10	2022
8. Poland	15.30	2022
9. Sweden	15.10	2022
10. Portugal	14.90	2022
11. Spain	14.50	2023
12. Czech Republic	14.50	2023
13. Denmark	14.30	2022
14. Finland	13.70	2023
15. Belgium	13.60	2023
16. Hungary	12.70	2022
17. Greece	11.00	2022

Source: Trading Economics, 2023.

Table 1.
Risk of Poverty Rate, selected countries

sioners in 2022 was the highest in the first ten countries: Estonia, 59.8%, and Latvia, 47.3%. Lithuania, 43.1%, Bulgaria, 6.8%, Croatia, 29.2%, Malta, 25.8%, Switzerland, 25.6%, Ireland, 24.1%, Cyprus, 21.2% and Serbia, 19.7%.

Note: the risk of poverty (AROP) rate according EU-SILC definition is the share of people with, equivalised disposable income after social transfer below the AROP threshold, which is set at 60%of the national median.

The countries with the lowest risk of poverty of pensioners were Norway, 7.9%, Slovakia, 9.5%, Luxembourg, 10.4%, Greece, 11.0%, France, 11.6%, Montenegro, 12.0 %, Hungary, 12.7%, Italy, 14%, Denmark, 14.3%, and Portugal, 14.9% (EUROSTAT, 2024). In December 2022, the at-risk-of-poverty rate in the European Union region had a record amount of 15.8%, while the relative poverty line of those aged 65 and over was 18.30% in December 2022 (Trading Economics, 2023).

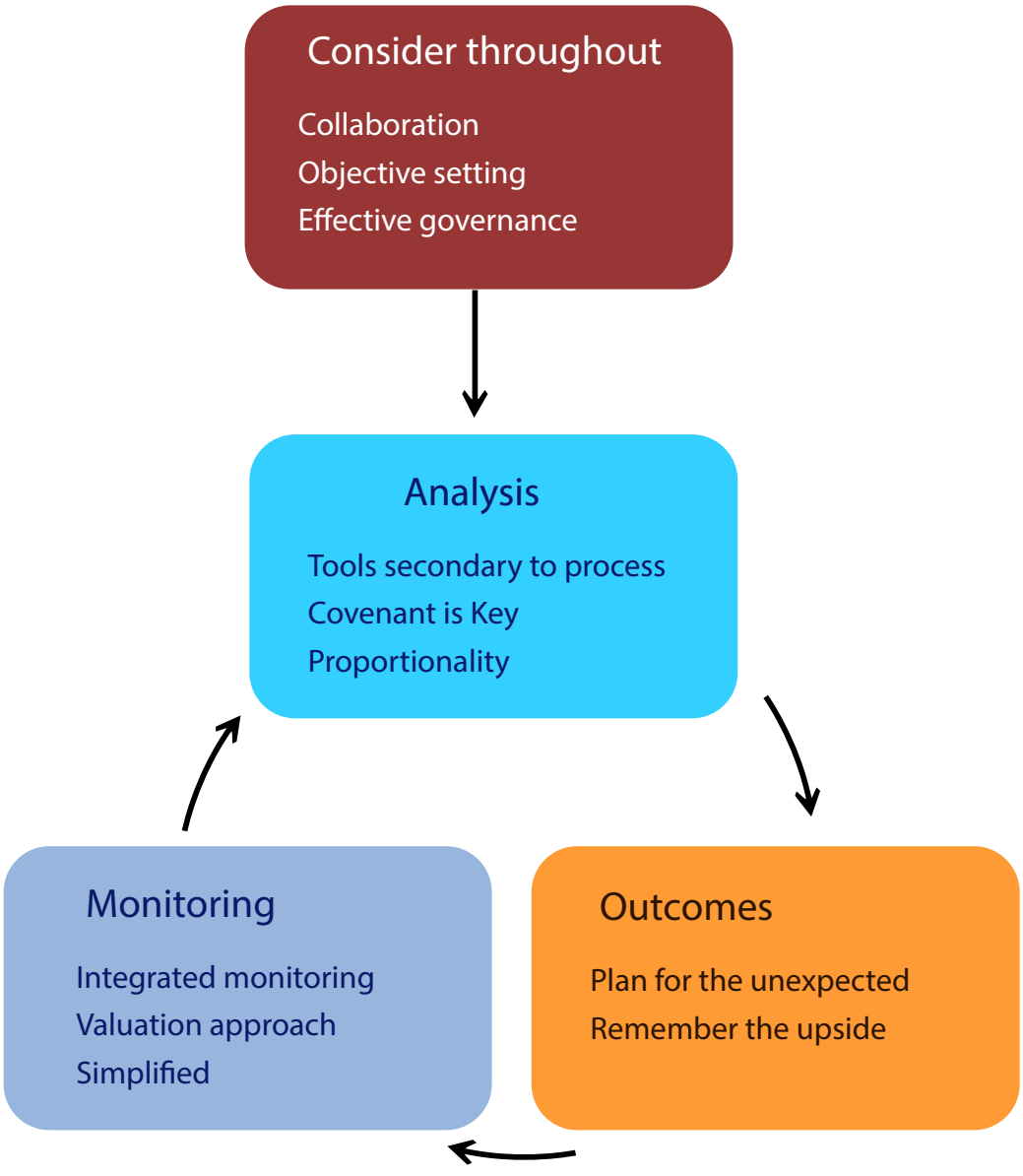


Figure 2:
The Model of Integrated Risk Management
Source: Hitchcox et al., 2017.

The Model of Integrated Risk Management (IRM)

Hitchcox et al. (2017) identified risk management tools from the perspective of contract, financing, and investment relations, as well as other risk factors being important: operational, legal, and political risks. Within the integrated risk management (IRM) approach, factors are managed that have effects on multiple areas that achieve goals. To what extent the goals will be achieved in the course of integrative management will depend on various factors. IRM factors include the following stages in the pension scheme decision-making process. 1. Consider throughout: a) Collaboration – includes cooperation of advisors that connects common interests because it results in a common strategy with clients; b) Objective setting - setting an objective long-term goal is the adviser's obligation to guide trustees and employers within the framework of agreed pension plans with defined responsibilities and risks; c) Effecti e governance - it is necessary to apply all the principles to reduce the risk of failure and that the management structure focuses on ensuring the reliable work of advisers in terms of obtaining adequate benefits for all members within the existing regulatory framework; 2. Analysis: a) Tools secondary to process - the model uses tools for information, for better understanding and monitoring of all process flows, which contributes to better quality in making managerial decisions; b) Covenant is key - represents an essential process in deciding on risks and on strategy of the pension system and in the pension scheme; c) Proportionality - the decision-making process in the IRM model is reduced in one part to an analysis that should be proportional the expected outcome and to the expected material benefit. This means that IRM has effects on the relationships between time and budget, work and contracts, investment and financing, in a way that is proportional to the successful outcome of the pension scheme; 3. Monitoring: a) Integrated monitoring - requires continuous monitoring of the employer in the field of financing and investment simultaneously with the realized profit before taxation; b) Valuation approach simplified - If the management is efficient the consequences of hard monitoring of the investment strategy are insignificant; 4. Outcomes: a) Plan for the unexpected - is a challenge for advisers in conditions of instability of the investment market because they are obliged to consider unexpected changes. In conditions of instability, for the adopted strategy to have positive effects, advisors should take adequate steps to change the contract between the trustee and the employer so that the strategy has results; b) Remember the upside - to manage adequately, managers or advisors should know the risks and potential risk increases in the pension scheme. The participants in the consultation can be one internal person, the IRM leader, a professional with experience and skills, or several persons who coordinate between the trustee and the employer. Managing and making quality decisions implies: 1. joint work of advisors (agreement reviewers, actuaries, investment consultants, and legal advisors) 2. cooperation between creditor and employer, 3. defining the goals of the pension scheme, 4. risk management and determining risk thresholds, 5. adoption of activities and plans in emergencies, 6. availability of management information periods, 7. regulating the responsibilities of professional investment committees and risk committees, and 8. using technology that creates opportunities to monitor the risk management strategy and process (Hitchcox et al., 2017).

According to Katanich, (2024), the management of pension systems in today's conditions has an increasing importance of artificial intelligence, which has positive effects on the performance of pension income, because costs and upcoming risks are reduced. In continuous application, the application in the decision-making process of investment managers, to better information processes, is significant. This creates opportunities for a real return on investment and the expected outcomes from the employer and the clients, with the fact that protection against cyber-attacks regarding the data of members of pension schemes is important. Glynn & Dovey (2023) explained that employers in pension schemes need to manage new technologies and enable extensive information supported by artificial intelligence. In this sense, management needs to coordinate work with providers for efficiency in the pension system. Management coordination refers to activities: centralized management of incoming and outgoing communication

on a common digital platform; connecting with platforms and user devices; integration with individual media; creating safe and secure use of the platform for each individual or member in terms of personal data protection Glynn & Dovey (2023).

Transition of pension systems

According to Altiparmakov (2014), during a comparative analysis of two pension systems, it is concluded that the funded private pension system, which is considered superior to the non-funded, is characterized by the fact that it explicitly invests in valuable securities and physical capital, in long-term, while the non-funded PAIG system invests human capital and pension contributions currently used to pay pensions to existing pensioners. In doing so, it is important to compare the performance of the two systems based on the implicit rate of PAYG contributions and the explicit rate of return on capital of the fund system. He came to know based on the Samuselson-Aaron theorem that the fund can be superior to PAYG only in a situation where the rate of return on capital is higher than the GDP growth rate. If this is not the case, one should opt for the transition to the PAYG public pension system because it is more efficient given that it creates opportunities for higher pension income for the same amount of paid funds (Altiparmakov, 2014; Samuelson, 1958; Aaron, 1966). Demographic aging has implications for both public (non-fund) and private (fund) financing, as the challenges are on a smaller scale than with the PAYG system. Altiparmakov pointed out that due to economic and demographic trends and the diversified way of financing, returns capital limited as well as potential benefits. A similar conclusion was reached by Chai and Kim (2018) based on empirical research regarding the transition from a public pay-as-you-go (PAYG) non-fund system to a fully funded fund system because it would have negative effects due to increased transition costs. The transition would cause an increase in national savings by reducing the consumption of the transition generations and would have negative effects on the deterioration of the income of workers in those generations. In such conditions, one generation of workers would bear the costs of two pensions, i.e. she would pay two pensions, for herself and the previous generation. This indicates the necessity of engaging decision-makers in the field of public policy management in the area of the pension system (Chai and Kim, 2018).

According to Sanchez-Romero et al. (2023), every pension system faces the challenges of population aging due to declining fertility levels and increasing life expectancy. In many developed countries of the world, state management, i.e. governments implement pension reforms to ensure the sustainability of the pension system by increasing the retirement age, and introducing penalties for early retirement or rewards for later retirement. Based on the results of the research, they concluded that in the conditions of a changing demographic and macroeconomic environment: a) pension reforms should be implemented from the aspect of the life cycle of the labor supply, taking into account the heterogeneity between individuals, and the perspective of the cycle in the future period, and b) to assess the sustainability of pension costs, with a focus on the effects of redistribution between different socioeconomic groups (Sanchez-Romero et al., 2023). Discussing the instability of the pension system, Jurek (2023) stated that the regulation of the retirement age represents an important political decision for the policy-makers of the pension system. Numerous initiatives have been launched in many countries to postpone the deadline for retirement even beyond the legal limit, although there is also another tendency to make economically "suboptimal" decisions because there is a tendency to retire when it is possible. During the research on the effect of certainty, it was confirmed that in countries where there is a relatively stable system, individuals are more likely to postpone retirement, otherwise when the pension system is unstable, there is a greater tendency to make a retirement decision as soon as possible. There are greater opportunities for the freedom to decide on the moment of retirement in DC schemes with defined contributions in contrast to systems with defined benefits (DB) for individuals depending on their abilities, needs, and preferences, and conscious decisions. Bearing in mind that the time dimension of retirement is very significant, the policy-makers must make an appropriate decision. In this way, different effects are achieved: 1. for individuals, the level of pension income and

the quality of life of the elderly population are determined; 2. the diversity of the workforce is determined for companies; and 3. a certain level of financi l sustainability of pension systems is established for state bodies (Jurek, 2023).

Given that there are changes within the pension systems, Gumola-Kardas (2021) emphasized that in the process of managing changes in the pension system, it is necessary to observe the effecti eness factor, which is more important because it is the measure of convergence between the defined goal and the obtained result, and thus, based on the results, the results are obtained practical implications. Based on the results, Slovakia, Bulgaria, Poland, and Croatia had the highest effe tiveness. Unlike them, Estonia and Latvia had the lowest effecti eness. Changes are necessary in pension systems that need reforms in changing demographic, economic, social, and political conditions but under the condition that they are supported by effecti e management. Although there is no ideal model for management in the pension system and for reducing the risk of poverty in the elderly population, it is possible to apply the experiences of successful countries to increase financial stability (Gumola-Kardas, 2021) adequacy, sustainability, or integrity of the pension system. This is confirmed by successful countries that rank at the top of the list in terms of classification of pension income and indicators of adequacy, sustainability, and integrity.

Classification of pension system

Based on the CFA Institute report (2023), pension systems were analyzed based on the Global Pension Index (GPI), a multidimensional index that contains three sub-indices: Adequacy, sustainability, and Integrity. The countries that are in the top three in the world according to adequacy are Portugal, Netherlands, and Iceland, according to sustainability Iceland, Israel, and Denmark, and according to integrity are Finland, Belgium, and Norway. The countries that are the first around the world based on a total GPI value that is greater than 80, which value is measured as an average value of 40% adequacy, 35% sustainability, and 25% integrity are the Netherlands, the first, Iceland, the second, and Denmark came third in the Index. They belong to the first class A, which has a strong, robust income system with good benefit , sustainability, and a high level of integrity. Classification of the system according to classes A, B, C, and D, as shown in Table:

Class B+ includes countries with a GPI in-

Class Pension retirement	GPI	Countries
A	>80	Netherlands, Iceland, Denmark, Israel
B+	75-80	Australia, Finland, Singapore
B	65-75	Norway, Sweden, UK, Switzerland, Canada, Ireland, Chile, Uruguay, Belgium, New Zeland, Portugal, Germany
C+	60-65	Kazakhstan, Hong, Kong SAR, US, UAE, Croatia, France, Colombia, Spain
C	50-60	Saudi Arabia, Poland, Japan, Italy, Malaysia, Brazil, Peru, China, Mexico, Botswana, South Africa, Taiwan, Austria, Indonesia, South Korea
D	35-50	Thailand, Turkey, India, Philippines, Argentina
E	< 35	Nil

Source: CFA Institute, 2023.

Table 2:
Classes of pension retirement according to GPI, 2023.

dex value of 75-80, Australia, Finland, and Singapore; Group B includes Norway, Sweden, the UK, Switzerland, Canada, Ireland, Chile, Uruguay, Belgium, New Zealand, Portugal, and Germany with GPI 65-75; in class C are Saudi Arabia, Poland, Japan, Italy, Malaysia, Brazil, Peru, China, Mexico, Botswana, South Africa, Taiwan, Austria, Indonesia, and South Korea, with GPI 50-60; in class D are Thailand, Turkey, India, Philippines, and Argentina with an index value of 35-50, and the lowest overall index value is Nil, which is classified in class E, which is characterized by the lowest index value of less than 30 and the weakest values of the three sub-indices, which is the worst or in the initial stage of development. For systems that require measures to improve all factors of the adequacy, sustainability, and integrity sub-indexes, a well-implemented management system with cost-effecti e retirement plans is important to initiate initiatives to increase the contribution rate. In systems that have worse values of the pension index (GPI), the reform program should contain several measures that include: increasing the number of employees and self-employed in the private pension system where a system of forced or automatic enrollment would be introduced, increasing pensions in the public pension system and extending the age age or retirement age, thereby saving money and reducing costs in the budget, promoting later retirement, as well as the participation of the workforce in older years, encouraging private savings, due to the removal of dependence on the public system, removal of the gap for certain groups regarding the pension income gap, improving governance in private pension plans and increasing transparency (CFA Institute, 2023).

Recommendations for the sustainability of pension systems

Based on the fiscal framework, countries should adopt reforms that would ensure an adequate and long-term financially sustainable pension system to create conditions for the fairness of pensions, decent living standards for the elderly population, and prevention of poverty (EPC, 2020). The responsibility of managing the pension system at the national level is on the governments of countries that implement public and regulatory policies, whereas in the field of social insurance, it refers, in addition to other social rights, to the protection of state pensions. To this end, the EU makes great efforts to implement a high level of social protection and the adequacy and sustainability of pensions. In this regard, the countries committed themselves to creating the conditions for: 1. adequacy of pension income, 2. financial sustainability of public and private pension schemes, 4. transparency, 5. adaptation to demographic aging and structural changes. This would enable support for a fair and socially just pension system, by promoting the security of funded public and private pension schemes (EU, 2010). Long-term financial sustainability of pension systems is possible with the application of certain mechanisms, according to EPC (2020), such as: 1 automatic balancing mechanism, which is applied to automatically adjust parameters such as regulated retirement ages, means of financing and benefits; indexing is flexible and adjusted according to needs. In Germany, the contribution rate has been adjusted automatically since 2004, thus balancing the pension scheme; 2. sustainability mechanism, which affects the amount of pension income; life expectancy is a sustainability factor because pension income changes depending on life expectancy at the time of retirement; it was introduced by France and Denmark; 3. automatic connection mechanism a) retirement age and b) life expectancy. The age limit mechanism has been applied in Italy, Greece, Denmark, and more recently in Slovakia, Cyprus, and Portugal, where the largest increase in the retirement age is expected in the long term, without applying the automatic link.

The countries in which the automatic connection of the two adjustment mechanisms is simultaneously applied are: Italy, Sweden, Portugal, Spain, and from 2023, Finland. Adequate indexation of pensions represents the main component of adequacy and sustainability, because the risks of poverty of the elderly population, the risk of disability, as well as the risk of hindering the basic rights for existence are suppressed. Adequate pension income creates opportunities for retirees to have primary conditions and spend their lives in a dignified way. Adequate pensions, according to Dudel and Schmied (2019), should mean a net pension income of about 100% of the last net income of working life, plus or minus 10 percent-

age points. By identifying a strategy for assessing the adequacy standards, the financial security of pensioners would be ensured, bearing in mind that they should last as long as possible due to the increasing increase in life expectancy and decreasing fertility (Dudel and Schmied, 2019). The European Union is based on the document The EU fiscal framework – the Stability and Growth Pact provided frameworks for the establishment of a sustainable pension system considering the impact of population aging. Based on the diplomatic agreement between the member states and the EU, economic policy and activities are coordinated by the EU, for the sake of economic stability (Liberto et al, 2023). Member countries undertake to reduce their national budget deficit to 3% of GDP, while public debt should be limited to 60%. The country that had the highest debt compared to other EU countries was Greece, with a debt-to-GDP ratio of 171.3% as of Q4 2022.

Conclusion

In the era of technological innovation, society is exposed to changes that create implications for raising awareness, promoting interest in innovative communication, and understanding the innovative functioning of the pension system. Digital technologies enable more efficien planning and management by decision-makers. Automation of communication facilitates better access to information for pensioners and members of pension schemes, and to make decisions about their investments. The Government's support in adopting proactive measures is very important because it would lead to the prevention of poverty among pensioners to ensure an existential level of pension income and, in addition, social protection in the form of social support and transfers for the elderly population. Great progress is represented by the government's integrative approach in the area of the pension system, investment, and public policy combined with the application of modern management principles and adopted strategies based on national and international legal frameworks.

References

Aaron, H. (1966). The Social Insurance Paradox. Canadian Journal of Economics and PoliticalScience/Revue Canadienne de Economiques et Science Politique, 32 (3), 371-374 . https://doi.org/10.2307/139995

Altiparmakov, N. (2013). Is There an Alternative to the Pay-As-You-Go Pension System in Serbia? Economic Annals, 58 (198), 89-114, DOI:10.2298/EKA1398089A, ISSN: 0013-3264. https://www.ekof.bg.ac.rs/wp-content/uploads/2014/06/199.pdf

Barr, N. (2000). Reforming Pensions: Myths, Truths and Policy Choice. IMF Working Pepers, 139. IMF, Fiscal Affairs Department, 1-57. https://www.imf.org/external/pubs/ft/wp/2000/wp00139.pdf

CFA Institute (2023). Mercer CFA Institute Global Pension Index 2023. CFA Institute Melbourne, 1-144. https://www.mercer.com/

Chai, H., & Kim, J. I. (2018). Demographics, Pension Systems and the Saving-Investment Balance. IMF Working Paper, 18/265. IMF, Fiscal Affairs Department, 1-21. /www.imf.org

Djukic, G. (2016). The Significance of the Reform of the Pension Insurance System in Serbia in Order to Overcome the Problem of its Non-Sustainability: thesis, in Serbian [Značaj reforme penzijskog sistema u Srbiji u cilju prevazilaženja njegove neodrživosti]. University of John Naisbitt, Faculty of Management. Zajecar, Serbia.

Dudel, C., & Schmied, J. (2019). Pension Adequacy Standards: An Empirical Estimation Strategy and Results for the United States and Germany. MPIDR Working Paper, 1-48. https://www.demogr.mpg.de/

European Commission. (2015). The 2015 Pension

Adequacy Report: Current and Future Income Adequacy in Old Age in the EU. Social Protection Committee, Luxembourg, 1-396, ISBN: 978-92-79-51682-5. https://doi.org/10.2767/050466.

EC (European CommissionEmployment, Social Affairs & Inclusion: ensions. https://ec.europa.eu/

EPC (Economic Policy Committee) (2020). Joint Paper on Pensions 2019. EPC, Brussels, 1-45. https://economic-policy-committee.europa.eu/system/files/2020-01

EU (2010). Progress and Key Challenges in the Delivery of Adequate and Sustainable Pensions in Europe: A Joint Report on Pensions. Occasional Papers, 71. EU, Social Protection Committee, Brussels, 1-83. DOI: 10.2765/71222, ISBN 978-92-79-16442-2. https://ec.europa.eu/

EUROSTAT (2024). At-Risk-of-Poverty Rate for Pensioners - EU-SILC survey 2024. DOI:10.2908/tespn100. https://ec.europa.eu/eurostat/databrowser/view/tespn100/default/bar

Hitchcox, A. N., Patel, C., Ramsey, C. J., Studd, E. L., Ma, L. T. Elliott, M. B., & Keogh, T. W. (2017). Integrated Risk Management for Defined Benefit Pension Schemes: A Practical Guide. British Actuarial Journal, 23, 1–60. https://doi.org/10.1017/S1357321717000095

Glynn, L., & Dovey, J. (2023). A Closer Look at Pension Technology and its Impact on Communication Innovation. Paragon - Customer Communication, 1-14. https://www.paragon.world/

Gumola-Kardas, M. (2021). Change in a Pension System: A Manageable and Measurable Process? European Research Studies Journal, 24 (3B). https://ersj.eu/journal/2474/

Ilic, B., Stankovic, S., & Ostojic, B. (2024). Key Factors of Promoting Innovative Performance in Agribusiness SMEs: Project an Empirical Method. Economics of Agriculture, 71(1), 135-154. DOI: https://doi.org/10.59267/ekoPolj2401135I

Ilic, B. S., Al Salaimeh, S., Andjelic, S. S., & Djukic, G. P. (2023). Human Resource Management Effects Functioning on Balanced Scorecard: Jordanian Public Joint-Stock Companies. In U. Akkucuk (Ed.), Managing Inflation and Supply Chain Disruptions in the Global Economy (pp. 81-103). IGI Global. https://doi.org/10.4018/978-1-6684-5876-1.ch006

Jurek, L. (2023). The Impact of (In)Stability of Pension System on Retirement Timing: Macro-Level Analysis Based on Certainty Effect. Journal of Social Policy, 1-21. https://doi.org/10.1017/S004727942300020X

Katanich, D. (2024). Which European Country Has the Best Pension System and What Does AI Have to Do with it? Euronews. Source online. https://www.euronews.com/business/

Li, Z., & Dalaker, J. (2022). Poverty Among the Population Aged 65 and Older. CRS Report, RE5791. Congressional Research Service, 1-26. https://sgp.fas.org/crs/misc/R45791.pdf

Liberto, D., Anderson, S., & Perez, Y. (2023). Stability and Growth Pact (SGP): Meaning, History, and Criticism. https://www.investopedia.com/terms/s/stability-growth-pact.asp

OECD (2023). Pensions at a Glance 2023: OECD and G20 Indicators, 1-236, ISBN 978-92-64-48100-8. https://www.astrid-online.it/static/upload/6780/678055dd-en.pdf

Pape, M. (2023). Understanding EU Action on Pensions. European Parliamentary Research Service, 1-12. https://www.europarl.europa.eu/

PPI (Pensions Policy Institute) (2023). The DC Future Book 2023: the Ninth Annual Report. Pension Policy Institute, London, 1-86, ISBN 978-1-914468-12-4. https://www.pensionspolicyinstitute.org.uk/

Sandberg, D., Kessler, K. K. E., Crossan, W. P. Mc., Milligan, A., Petertil, J., Rappaport, A., & Rizzo, J. (2020). Risk Management and Public Plan Retirement Systems. PPPTF Report to American Academy of Actuaries Board of Directors, 1-56. https://www.actuary.org/

Samuelson, P. A. (1958). An Exact Consumption-Loan Model of Interest with or Without the Social Contrivance of Money. The Journal of Political Economy, 66 (6). https://dx.doi.org/10.1086/258100

Sarfati, H., & Ghellab, Y. (2012). The Political Economy of Pension Reforms in Times of Global Crisis: State Unilateralism or Social Dialogue? Working Paper 37. International Labour Office, Gene a, 1-101. https://www.ilo.org/

Sanchez-Romero, M., Schuster, P., & Prskawetz, A. (2023). Redistributive Effects of Pension Reforms: Who are the Winners and Losers? Journal of Pension Economics and Finance, 1-27. https://10.1017/S147474722300015X

SPC (Social Protection Committee) (2021). Pension Adequacy Report: Current and Future Income Adequacy in Old Age in the EU. European Union, Luxembourg, 152. ISBN 978-92-76-38203-4. https://org/10.2767/013455

Stankovic, S., Ilic, B., & Rabrenovic, M. (2024). Using the Composite EEPSE Green Economy Index to Assess the Progress of Emerging Economies in Achieving the Sustainable Development Goals. Problemy Ekorozwoju, 19(1), 78–88. https://doi.org/10.35784/preko.5751

Stewart, F. (2022). Understanding Poverty: Pension and Insurance Funds. The World Bank. Source online. https://www.worldbank.org/

Trading Economics (2023). Euro – Area – At Risk of Poverty Rate of Pensioners. Source online. https://tradingeconomics.com/euro-area/

WB (World Bank) (2023). Pensions. Source online. https://www.worldbank.org/en/topic/pensions