The challenges of the sustainability of state pension systems

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Abstract: Nowadays, financial knowledge and financial literacy are a fundamental issue in everyday speech, as the crises and their consequences have highlighted the shortcomings of financial knowledge. When we talk about the causes of crises, we always mention the responsibility of households, companies and banks, in addition to the responsibility of governments. One of the main reasons for this may be a lack of financial knowledge and financial awareness. Many articles and studies deal with the importance of financial culture today. All of these studies point to the importance of financial literacy. Financial literacy can only be developed through education. The reform of the state pension system is a cardinal and noteworthy topic in all countries of the European Union and is often discussed at various scientific meetings. The presentation and related study describe the current pillars of the international and Hungarian pension system, and using demographic and statistical data, address the problems of the mandatory social security system in detail, such as the sustainability issues of the current system. The main goal of the research is to present the possible scenario of changes in pension benefits in Hungary. Using a variety of statistics and research based on a questionnaire of economic attitudes.

Keywords: financial crises, sustainability and modeling of state pension systems, pension savings, pension security, the role of financial culture in education

1 Introduction

According to the calculations of the United Nations (UN), the total world population exceeded the 8 billion milestone on November 15, 2022 (UN, 2021). More than half of the world's population (51.6 percent/4.11 billion people) lives in the seven most populous countries: China, India, the United States, Indonesia, Pakistan, Nigeria, and Brazil. It took more than 50,000 years for the world's population to reach 1 billion. Since 1960, we have added successive billions every decade or two. The world population was 3 billion in 1960; It reached 6 billion around 2000, and the UN predicts it will exceed 9 billion by 2037. However, the rate of population growth is currently slowing from an annual peak of more than 2 percent in the late 1960s to about 1 percent. to half of this by 2050. Population aging is the dominant demographic trend of the twenty-first century—increasing life expectancy, declining fertility, and the advancement of large cohorts into old age. Never before have such a large number of people reached the age of 65 (the traditional old-age threshold). According to our expectations, in the next three to four decades, one billion elderly people will be added to the more than 700 million elderly people living today. Among the older population, the over-85 group is growing particularly fast and is projected to exceed half a billion in the next 80 years. This trend is significant because the needs and capacities of those over 85 are generally significantly different from those between 65 and 84. The age structure of a population primarily reflects its fertility and mortality history. In high-mortality populations, improvements in survival occur disproportionately among children. This effectively creates a baby boom. Eventually, the boom ends when fertility declines due to perceptions of improved child survival, and fertility declines as desired with economic development. But as relatively large baby-boom cohorts move through adolescence and adulthood, the proportion of the population swells during peak working and saving years. The increase from 7 billion to 8 billion took only 12 years, raising long-standing fears about rapid population growth, including food shortages, rampant unemployment, population depletion, and uncontrolled degradation of natural resources and the environment. Earth's carrying capacity is about 5 billion people. So the Earth can provide an adequate amount of resources (e.g. soil, drinking water) for 3 billion fewer people than at present. Furthermore, for the previously mentioned reasons, it is questionable whether there will be an adequate pension level in aging societies.

2 Pension systems in OECD countries

The Organization for Economic Co-operation and Development (OECD) is an international economic organization based in Paris, of which Hungary has been a member since 1996. in the development and evaluation of social policy. According to the OECD, pension systems usually consist of "three pillars" (see Figure 1).

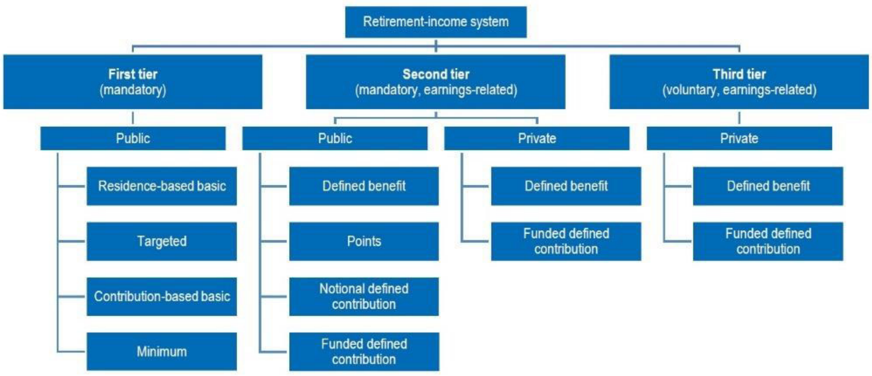

Figure 1 Summary framework of the various pension financing systems
(OECD, 2019, 2021, Novoszáth, 2014, own editing, 2022)

The "first pillar" (state) pensions are legal state pensions managed by the state, usually financed from social security contributions and/or general tax revenues on a pay-as-you-go (PAYG) basis. In some countries, individual plans financed by law have been introduced alongside the first pillar. "Second pillar" (employer) pensions are private supplementary programs related to the employment relationship. Finally, "third pillar" (personal) pensions are personal pensions, i.e. pre-financed private voluntary supplementary programs in which contributions are invested in an individual account managed by a pension fund or financial institution.

Pension systems can be grouped based on the principle of financing and the principle of operation. Regarding the financing of pension systems, there are three main types based on the principle of current financing and capital coverage: pay-as-you-go, capital coverage and expectation coverage systems. Based on the form of financing, there are also two types: the pay-as-you-go (PAYG), otherwise known as the financing system, and the funded system. In terms of the operating principle of the pension system, there are two types: the defined benefit (DB) and the defined contribution (DC) pension system.

	Pension System		*Private Pension Coverage*	
	Public	*Private*	*Mandatory*	*Voluntary*
	Type	*Type*	*%*	*%*
Australia		DC	85	18
Austria	DB			13.9
Belgium	DB			55.6
Canada	DB			39.4
Denmark	DB+DC	DC	>90	
Finland	DB			8.7
France	DB+points			15
Germany	Points			64
Hungary	DB	DC	74	31
Iceland		DB	>90	
Ireland	DB			42.9
Italy	NDC			10.6
Japan	DB			45
Mexico		DC	34.5	
Netherlands		DB	>90	
New Zealand				32.6
Norway	Points		>90	60
Poland	NDC	DC	71.7	1
Slovak Republic	Points		65.8	
Spain	DB			8.7
Sweden	NDC	DB+DC	>90	
Switzerland	DB	d.credit	>90	
United Kingdom	DB			47.1
United States	DB			46

Figure 2 Funding and operating principles of pension systems
(OECD, 2019, 2021, own editing, 2022)

In time, DB pension financing systems based on the principle of capital coverage were formed first, and the consequences and experiences of the Second World War led to the transition to DB systems based on the pay-as-you-go principle. Later, in parallel with the strengthening of the capital markets, DC systems based on the principle of capital coverage were formed and developed, and starting from the 1990s - in developed countries - the transformation of the systems into DC systems with current financing can be observed more and more. The pay-as-you-go pension system is based on the solidarity of the successive generations, while the essence of the capital protection system is self-care (Dezse, 2022).

During the 1950s, no distinction was made between defined benefit (DB) and defined contribution (DC) pension systems. Sometime later, when they recognized the difference between these two systems, they believed that annuity-based financing was synonymous with pay-as-you-go financing, and that contribution-based financing was equivalent to equity financing. However, in the mid-1990s, Sweden reconsidered the previously pay-as-you-go pension system, and as a result of the reform, a notional defined contribution (NDC) system was introduced, and this highlighted the need to treat the endowment system as synonymous with defined contribution - if not necessarily incorrect - but definitely an oversimplification (Dezse, 2022). The points system and the basic pension system (DB+Ponts) differ from the pure points system (Ponts) in that a part of the total pension, say half, goes equally to all old-age pensioners, and only the other half is distributed in proportion to the earned pension points (Simonovits , 2010, 2019).

The Figure 1 summarizes the financing and operating principles of pension systems in OECD countries. In Hungary, the state pension system is DB-based and accounts for 74% of the pension benefits, which means that there is a high dependence on the state pension system. Based on the OECD's recommendation, it would be important to put more emphasis on self-care, which could reduce the high dependence on the state pension system. Occupational pension schemes are not present in all OECD countries, and when they are, they may be voluntary or compulsory, while some countries have both. Along these lines, structural differences in pension systems and various reforms have led to different pension systems in individual countries. The vast majority of pension systems are public. At the same time, several countries have introduced occupational pension systems and/or private mandatory and voluntary systems (European Commission, 2021). In most countries, earnings-related old-age state pension systems are the main type of insurance, except for example Denmark, Greece, Ireland and the Netherlands (European Commission, 2021). The vast majority of European countries also provide a minimum guaranteed pension, which is usually means-tested, to ensure minimum adequacy for all pensioners. In contrast, in some other countries, such as Denmark, Ireland, the Netherlands and the United Kingdom, the minimum guaranteed pension is provided by a flat-rate pension that pays the same amount to all pensioners (European Commission. 2021). Most pension systems rely on a state (earnings-based) pension system. The basic indicator of the generosity of the pension system is the replacement rate, i.e. the percentage of employees' pre-retirement monthly income that they receive after monthly retirement. Recent evidence shows that the theoretical net substitution rate from mandatory schemes averages 59% and ranges from almost 30% in Lithuania and the UK to almost 90% in Austria, Italy and Portugal (OECD, 2019). Therefore, it becomes essential to examine whether enough information is provided to people to understand whether they are aware of how the pension system works in their own country.

3 Investigation of the sustainability of public pension systems

The sustainability and adequacy of social security systems primarily depends on how the level of employment and contributions deducted from the income of the employed, taxes and savings set aside for pension purposes develop and what influence they have on it (Augusztinovics, 2014). The sustainability and adequacy of social security systems primarily depends on how the level of employment and contributions deducted from the income of the employed, taxes and savings set aside for pension purposes develop and what influence they have on it (NYIKA, 2010, Mészáros, 2014, Banyár, 2016). The financing rules, eligibility conditions and labor market conditions must be adjusted in such a way that there is a balanced relationship between contributions and entitlements, the number of actively contributing employees and retired beneficiaries (Novoszáth, 2017).

Figure 1 summarizes the summary framework of the various pension financing systems based on the OECD. The Hungarian pension system currently consists of two pillars, the mandatory social security system ("giant") and the voluntary private pension system ("dwarf") (NYIKA, 2010, ONYF, 2015). Of the 30 OECD countries, only Hungary, New Zealand and Ireland do not have a mandatory second pillar, which includes community and private systems (Novoszáth, 2014). The previously mentioned demographic pressure can be modeled with economic-social impact assessments. In European countries, including in Hungary, the state pension system operates on a pay-as-you-go basis based on different financing principles and pre-calculations are made for the sustainability of the pension system. The essence of the pay-as-you-go principle is that it is tax-free: the pension contribution is paid out (imposed) on active employees, and it is distributive: the pension contributions collected from the employees are distributed among the current pensioners as a pension benefit. In pay-as-you-go systems, current pension expenses are covered from the contributions of economically active employees (Samuelson, 1958).

The European Union published its report on the change in the number of people living in the Union on its official website (Eurostat, 2015). The contents of the report are not very positive for Hungary. Considering the rate of population decline, the population of Hungary in 1995 was still 2.1% of the European Union, by 2015 only 1.9% of the population of the Union could call themselves Hungarian citizens. The basis of the sustainability of the pay-as-you-go pension system is that there are far more people of working age than people of retirement age, otherwise the balance of the system will be upset (Holtzer 2010). Based on his precalculations, the ratio of employed and retired people in OECD countries will change in an inappropriate direction, as the number of elderly people will increase and the number of people of working age will decrease, which are summarized in Figure 3.

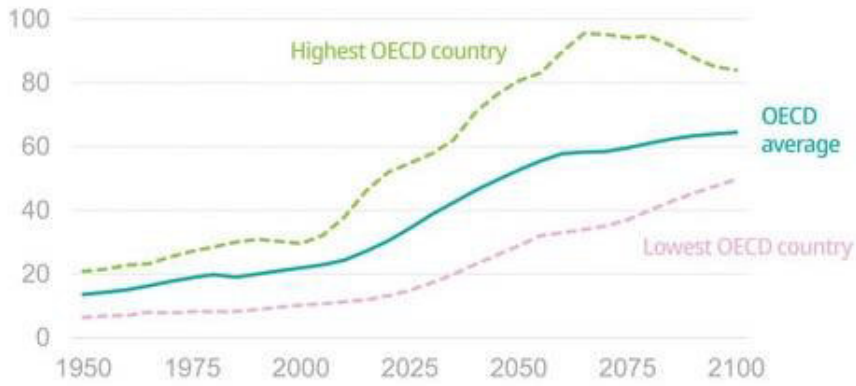

Figure 3 Old age ratio pensions
(OECD, 2019, 2021, own editing, 2022)

In Hungary KSH projections show that the proportion of pensioners and those of working age rose slightly from 22.4% in 1970 to 22.4% in 2000, but could rise to 47.7% by 2050. This means that in 1970 one pensioner was supported by five workers, while in 2050 one pensioner will be supported by the contributions of two workers (Simonovits, 2002). According to the medium-term macroeconomic forecast of the Ministry of Finance at the end of 2019, economic growth is expected to remain around 4 percent, and inflation will remain around the 3 percent target. In addition, until 2023, they forecast a confident reduction in the budget deficit, a decreasing state debt and limited budget room for maneuver. According to the PM, the labor market processes between 2019 and 2023 are likely to continue their favorable trend, as employment growth is associated with low unemployment. Average earnings may increase by 10.8% in 2019 and 9.3% in 2020. In addition, inflation may reach 3.4% in 2019, 2.8% in 2020, and 3% thereafter. The economic protection measures already in place and planned will probably contribute to protecting the achieved results and maintaining growth above the EU average (PM, 2019). According to forecasts, the state pension and the corresponding pension level will remain mostly unchanged in the short term, which still justifies the need to strengthen self-care in order to achieve an adequate pension in the long term.

4 Self-care as an option for pension security

The definition and importance of financial culture is one of the popular topics today. The financial crisis highlighted how much damage a lack of financial literacy can cause, and how much destruction events caused by irresponsible financial decisions can cause. Nevertheless, it should not have taken nearly ten years for the development of financial culture, but it should have started worldwide immediately after the crisis. The low level of knowledge was not an unknown fact in Europe and the United States of America either, as several articles and studies drew attention to this long before the crisis (Van Els et.al, 2007). The lack or insufficiency of financial literacy causes damage to the economy and leads to irresponsible decisions, which in many cases must be resolved by governments, just as in Hungary regarding the bailout of foreign currency loans.

Many researchers have already tried to formulate the definition of financial culture, but this study builds on the definition used by the Magyar Nemzeti Bank. In the strict sense of the word, financial literacy means financial reading and writing skills, which requires special professional knowledge. According to the generally accepted definition, "a level of financial knowledge and skills, with the help of which the individual is able to identify the basic financial information necessary for conscious and prudent decisions, to interpret it after obtaining it, and to make the actual decisions based on it, assessing their possible future financial and other consequences " (MNB – PSZÁF, 2008). Based on Atkinson and Messy's (2012) definition, financial literacy is a combination of knowledge, skills, abilities, attitudes and behavioral patterns that are essential for making appropriate financial decisions at both personal and societal levels. With financial culture, prosperity can be increased and improved, which can be felt not only at the micro level, but also at the macro level. Luxander et al. (2014) in their opinion, financial literacy is basically the ability to process financial information and make appropriate financial decisions.

The findings of Angus Deaton's Nobel Prize-winning British economist's research on consumption, well-being and poverty support that money does make you happy if you use it to move from poverty to subsistence and then to security. Above a certain level, however, more money no longer causes a significant improvement in the quality of life (Steptoe - Deaton - Stone, 2015). It should also be mentioned that he conducts research on the technique of surveying people living on less than one or two dollars a day and the reliability of the data, especially the household surveys conducted by the National Sample Survey (NSS) in India. His research also covers the relationships and national economic effects of social status, health, income and education. The Almost Ideal Demand System (AIDS), created by Angus Deaton, is the first globally applicable method for assessing poverty. The concept of the so-called Deaton paradox also comes from him, i.e. the fact that the level of consumption usually does not change even during rapid increases and decreases in income (Deaton, 2017). If we look at the levels of Maslow's hierarchy of needs, at the first two levels, income and money are necessary to be able to buy food, have a place to sleep and live, and we can achieve these almost exclusively with the contribution of money. Of course, these needs must also be satisfied in the long term, so it is clear that for the second level, money as a tool is the key to our long-term sustainability. As you move up the pyramid, you become more and more happy and satisfied with your own life. After this level, money as a value can do nothing more for our happiness, since love and acceptance cannot be bought by definition. The hierarchy envisioned by Maslow does not apply in all cases, as confirmed by numerous researches (Wahba - Bridwell, 1976).

Based on the forecasts, the number of pensioners will increase drastically, this cannot be changed in the short term. The Hungarian pension system currently relies on two pillars. Pillar I: the state pension system operates on a pay-as-you-go basis and Pillar II. pillar, which operates on the principle of capital coverage (Novoszáth, 2014). In the current pension system, choosing a voluntary pension fund can be an additional element of ensuring a living in old age. The voluntary pension fund can enable us to maintain the standard of living we were accustomed to during our active years upon retirement. These institutions supplement other retirement savings, such as pension insurance. In the general public perception, a pension is the pension that the elderly citizens of a country receive on a subjective basis, i.e. not on the basis of need. Its amount depends on the length of service, i.e. the number of years spent working (earning) and previous income (Matits, 2016). This definition reflects public opinion, according to which the concept of pension is exclusively related to social security benefits. However, any regular old-age income to which we are entitled during our active years can be considered a pension. Thus, our retirement income from some retirement savings can or could be a pension. It should be made aware that there is not and cannot be a form of state care that could promise an adequate pension for everyone, in all cases. In other words, if we really want to be safe in our old age, we must do a lot ourselves. In addition to raising taxes and contributions and pushing the retirement age further, there is also a more efficient and sustainable solution, which is called self-care. This means that people create for themselves the private pension fund that allows them to live a full life in old age. This also relieves the burden on the state, because, although with state aid, money is being set aside privately. They manage their own assets and do not pay more into the joint.

There are many different ways to save for retirement. Before choosing the right savings product, we must decide in advance to what extent the time period and liquidity will matter in the selection of the savings form. The state supports three types of pre-saving solutions for retirement purposes: the voluntary pension fund, the pension pre-savings account and pension insurances. For these, it is worth thinking in terms of at least 10-20 years. Accumulated private pension capital can be withdrawn upon reaching retirement age, with certain restrictions it can also be accessed earlier.

5 The role of self-care in our decisions

The primary research is also directed at the current and future state of direct persons. We are curious as to what guides the respondents to the self-care decision, what habits and processes influenced their decision, and more precisely what motivated them to choose the examined form of savings. With the help of the questionnaire research, we examined the respondents using the methodology of behavioral economic foundations and factor analysis to see what decision-making options are available to us in relation to the pension level expected in the future. The research examines the extent to which self-care as a supplemental pension pillar plays a role in the public consciousness and in our decisions today, as well as what possible pension system is considered desirable in the future, what the pension of the future generation will consist of, how many people will work and how in the future. The research starts from the basic assumption that people think about pensions with fear and uncertainty. Based on the previous chapters, it can be seen that the pay-as-you-go system is in crisis, so the pension system II. pillar, self-care is getting more and more attention these days.

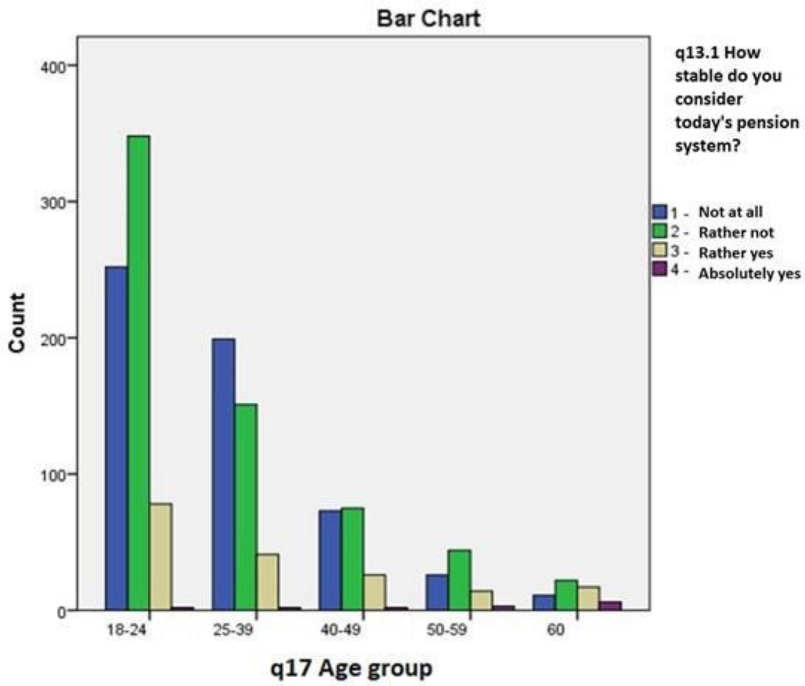

Figure 4 Pension system - Effects of demographic factors on financial awareness
(own editing, 2022)

The questionnaire data was processed using statistical methods. The online questionnaire research took place between April 26, 2020 and May 23, 2020. The total number of respondents was 1410 (n=1410). Anyone could fill out the questionnaire, but it was mainly addressed to colleges and universities where students and lecturers had economic and financial knowledge. Parallel to the research, an international research was also connected, where the online questionnaire was addressed to finance and economics students and lecturers from European and American universities. The total number of respondents was 127 (n=127). The international research is still being evaluated and published. Basic questions to which we sought answers were related to the planning of pension systems, forms of saving for retirement and self-care, pension security, as these are the elements that determine the financial background of our future existence, i.e. the extent of our self-care. The questions of the questionnaire survey were divided into the following groups:

• Financial and economic knowledge (e.g. economics or finance degree)

• Knowledge of pension systems (e.g. mandatory, voluntary)

• The role of self-care (e.g. savings)

• Financial planning (e.g. consulting)

• Cybersecurity issues (e.g. data protection, the role of information security in our lives)

• Mapping of personality traits (e.g. optimist, maximalist)

• What goals do we want to achieve (e.g. founding our own company, having children)

The groups were subjected to a number of statistical evaluations to examine demographic effects on the questions, such as means, frequencies, cross-tabulation. In this study, we only examine the role of the state pension and self-care, as well as the importance of data and information security in the case of online services. Based on the answers to the questions in the questionnaire and Figures 4 and 5, the respondents are basically informed about the issues related to pension systems, but the current state pension system is not considered stable by 40.2% of the respondents. On the other hand, they prefer pre-saving for retirement, based on the yes answer of 47.4% of the respondents. The results also show that financial savings are important to respondents. Based on the average age of those who completed the questionnaire (average age: 30.6 years), savings are important. Further analyzes show additional internal relationships, such as the role of optimism in retirement savings. Savings for retirement is more important for optimistic women, as yes answers are higher than for men with similar characteristics. Furthermore, in addition to the safety of savings, the respondents consider online services, data protection, and information security in relation to the pension system and self-care to be important.

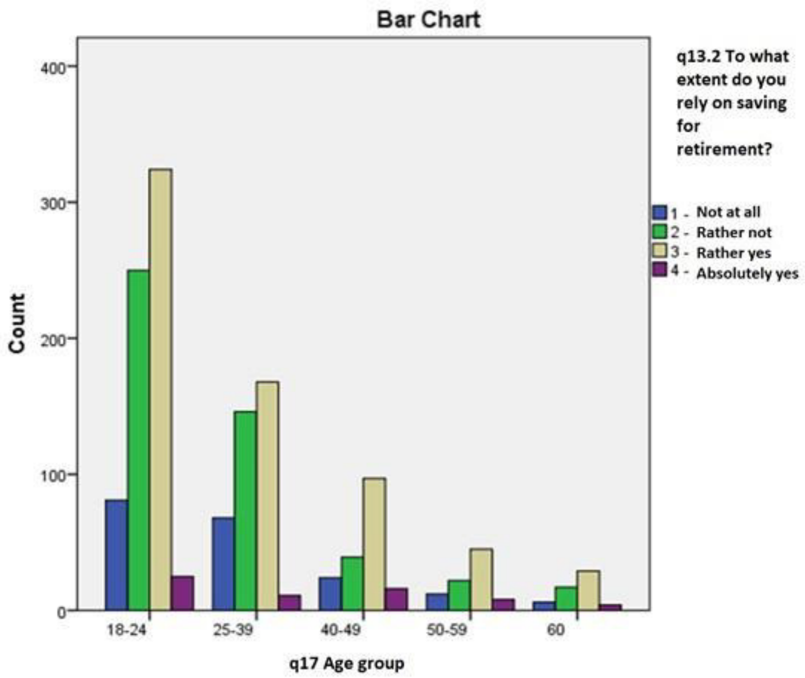

Figure 5 Pension savings - Effects of demographic factors on our financial decisions
(own editing, 2022)

Conclusion

The current pension systems, due to the high degree of aging of societies, and based on the forecasts, the drastic change in the ratio of active earners and pensioners will most likely cause social, economic and other problems globally and in our country in the future. Living in old age and preserving the sense of security of the retired society is a priority social interest. In most European Union countries, public systems play a central role in enabling people to reasonably maintain their standard of living during their working years and beyond retirement. The challenge facing the pension policies of the member states is to create systems that are financially sustainable in the long term and fulfill the basic purpose of the pension systems, namely to enable an adequate income and standard of living for the elderly, as well as to ensure their economic independence. They should create an institutional system that is able to create sufficient coverage in the long term to create the security of the retired society.

Due to the high rate of aging of society, the current pension system and, based on forecasts, the drastic change in the ratio of active earners and pensioners will most likely cause social, economic and other problems in the future globally and in our country as well. Experts argue in favor of a mixed system, but there is no accepted concept that everyone would like. Due to the mandatory nature of the state pension, there is no choice.

Based on the literature review and research, we were not able to prove with certainty that a harmonious old age and pension security are possible even without material well-being, but we managed to clarify that in order to maintain our current standard of living in retirement, it is necessary to take care of ourselves in some financial form in the future. We already have three state-supported options for this, the choice is up to us as to which one or which ones we choose. When it comes to saving for retirement, the amount of our income and our emotional decisions determine which form or forms of savings we choose.

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