

THE IMPACT OF DEMOGRAPHIC CHANGES ON THE PENSION SYSTEM FINANCING SUSTAINABILITY IN THE FEDERATION OF BOSNIA AND HERZEGOVINA

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ABSTRACT

The aging of the population causes unfavourable demographic trends that are significantly affecting the current state and the future of pension systems on a global basis. The increased number of pensioners and a significant decrease in the rate of demographic reproduction have negative effects on the sustainability of pension systems based on intergenerational solidarity (pay as you go systems), which are prevalent in most European countries. In this paper, the issue of demographic aging and pension systems is analysed from the point of view of sustainability of public finance in the Federation of Bosnia and Herzegovina (FBiH). There are three projected scenarios and the worst one is based on the assumption that pension expenditures will grow at a pace similar to the period from 2002 to 2012. In that case, the share of pension expenditures of Gross Domestic Product (GDP) in 2035 would be over 25%, which is unsustainable by any means. According to long-term projections of the reformed pension system of the FBiH, the greater stability of initial and average pensions, as well as stable social security of pensioners, will result in a relatively stable share of pension expenditures in GDP, of about 10%.

Keywords: demographic changes, pension expenditures, public finance, Federation of Bosnia and Herzegovina (FBiH)

JEL: G17, G22, H55.

1. INTRODUCTION

From their beginnings, pension systems were designed to fight against extreme forms of poverty among older and disabled people. After World War II, the majority of European countries stopped using the system of collective capitalization of pensions. Due to this, the model of current distribution (the so called “pay as you go” system or PAYG system) prevailed in the pension systems of developed countries, which could be set up relatively easily and quickly.

The above-mentioned model of current distribution faced many challenges and problems, which are mainly caused by an aging population and changes in the work structure. The aging of modern population is becoming a global phenomenon and is greatly affecting the current state and the future of pension systems. Firstly, it leads to prolongation of life expectancy. Furthermore, it leads to a significant decrease in the demographic reduction rate, i.e. low fertility.

Significant spending on pension and disability insurance (10-15% of GDP), with the already mentioned adverse demographic trends and the retention of the existing state, could lead to a significant negative impact of the public pension system (PAYG system) on the sustainability of public finance in some countries. Such phenomenon has not bypassed the pension system of the FBiH and the pension systems of the neighbouring countries.

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Bosnia and Herzegovina and the FBiH have their own peculiarities that further complicate and aggravate the stability of the pension system, such as (Government of the FBiH, 2013):

- complicated and complex political-territorial structure,
- high level of underground economy which results in insufficient coverage of all working age people, and
- the unresolved system of pension and disability insurance in certain population categories.

The relevance of this topic arises from discussions that are currently led in the Government of the FBiH. A document *Proposed Strategy for Reform of Pension System in the Federation of Bosnia and Herzegovina* has been presented. It deals with the upcoming and possible reforms of pension system of the FBiH. The document also analyses the problems of demographic aging and pension system in terms of the sustainability of public finances of the FBiH.

The aim of this paper is to point out the long-term unsustainability of the current state in the FBiH and the necessity of reform. If nothing changes, the continuous aging of the population and low activity rates will dominantly influence the pension system of the FBiH. This will result in a growing number of pensioners up until 2040, when that number will also start to decrease due to the overall decrease in the number of the population (Government of the FBiH, 2013).

In the first part of this paper, demographic movements and spending on pension insurance are shown, as well as the share in GDP. The above-mentioned indicators in the FBiH are compared with those in the countries of the European Union (EU) and the immediate surroundings. The second part of the paper gives an overview of the FBiH. The

third part presents the methodological framework and research results. The conclusion gives a brief summary of research, discussions and recommendations based on research results.

2. LITERATURE REVIEW

Considerable demographic changes have caused scientists and researchers in different disciplines to consider possible long-term effects of these changes. A number of papers deals with the issue of demographic aging impact on public finances.

Dang et al. (2001) and Jackson (2003) studied the fiscal impact of aging population on the level of the Organization for Economic Cooperation and Development (OECD) and EU countries, not neglecting any other economic areas which could be affected by demographic changes in the long run.

The Institute of Economics in Zagreb analysed the long-term fiscal effects of demographic changes in Croatia in a study in 2006. The study links the expected long-term demographic movements with their possible fiscal implications. The research was designed as a practical usage of the European Commission (EC) methodology for the projection of long-term trends in fiscal expenditures connected with aging in Croatia. Accordingly, the research projected the long-term trend in pension, health, education, and unemployment expenditures. Furthermore, the movement of fiscal revenues was rated and a long-term fiscal position was projected in terms of public debt and deficit.

In the document of the Government of the FBiH from 2008, a projection was made on the sustainability of the pension system in the FBiH under the assumption that there will be no reform of the pension system. The projection simulates changes in the number of pensioners, number of insured, total expenditures for pensions, and the level of pensions of GDP.

Zdravković et al. (2012) analysed the issue of demographic aging and pension systems in the context of sustainability of public finance in Serbia. The main objective of the analysis was a long-term projection of pension expenditures as shares in GDP, which was indirectly achieved by modelling the average pension expenditures. The results of the analysis indicate that there is a fiscal space that could be used in the long term to achieve growth in pensions with the reduction of total pension expenditures in GDP.

3. DEMOGRAPHIC TRENDS AND SUSTAINABILITY OF THE PENSION SYSTEM

One of the most significant challenges and problems of the pension system across the world is the demographic aging of the population, caused by an increase in life expectancy and a decline in birth rates. Various projections point out the adverse trends on a global level, which result from constant demographic aging of the population.

Table 3.1 displays the assumptions of the EC on demographic trends in the European Union for the period from 2008 to 2060.¹

According to these projections, the total population will grow until the year 2020, stagnate between 2020 and 2040, and fall between 2040 and 2060.

Working age population will decrease in the period 2020-2040. After that, it will significantly fall, by about 10%. The projection of the demographic dependency rate shows that the rate will increase from 25.4% in 2007 to 53.2% in 2060.

Similar demographic trends are also present in the FBiH, as well as in the neighbouring countries. According to the World Bank projections on the share of old population (65+) in the total population number, its increase is seen in all countries, as shown in Chart 3.1.

Table 3.1. Assumptions on demographic trends (2008-2060)

Period	2008 - 2020	2020 - 2040	2040 - 2060	2008 - 2060
Total population	3.7	0.0	-1.6	2.1
Working age population (15 - 64)	-0.4	-4.4	-10.2	-15.0
Dependency ratio	25.4	31.1	53.5	28.1

Source: *The 2009 Ageing Report, Assumptions (European Commission, 2008)*

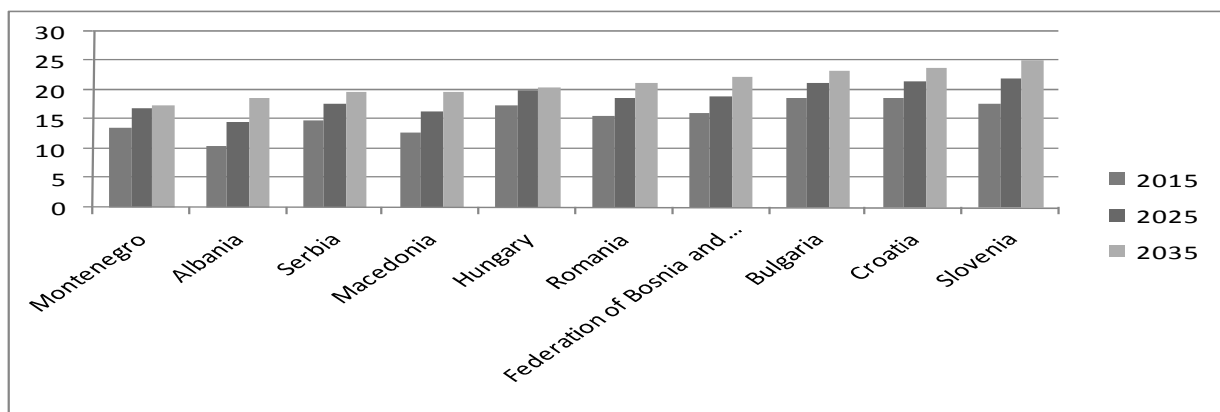


Chart 3.1. Projections of changes in the share of the old population of the FBiH and the neighbouring countries

Source: World Bank, web database: <http://go.worldbank.org/KZHE1CQFA0>

*Source: Government of the FBiH (2013): *Proposed Strategy for Reform of Pension System in the Federation of Bosnia and Herzegovina, Sarajevo, p.10*

The issue of sustainability of pension systems is a matter of great importance in many countries. Today, pensions represent a large and constantly growing share of public expenditures, on average more than 10% of GDP in the EU as a whole. Pensions have a tendency to grow and it is likely that by 2060, they will amount to more than 12.5% of GDP (the EC, 2012). Although faced with similar demographic challenges, other countries differ in expenditures on public pensions. For example, Ireland has 6% of GDP, Italy has 15% of GDP, and so on (the EC, 2012).

There is an increase in pension expenditures in many countries in relation to 2010. In Italy, the share of pension expenditures in GDP in 2012 amounted to 15.5% (an increase of 0.8% in relation to 2010), in Poland 12.3% (an increase of 1% in relation to the previous year). When we compare the FBiH with the selected OECD countries, it can be seen that the FBiH belongs to the countries with higher public spending on pensions.

When it comes to different pension systems, the so-called *pay as you go* system (the system of intergenerational solidarity) is particularly

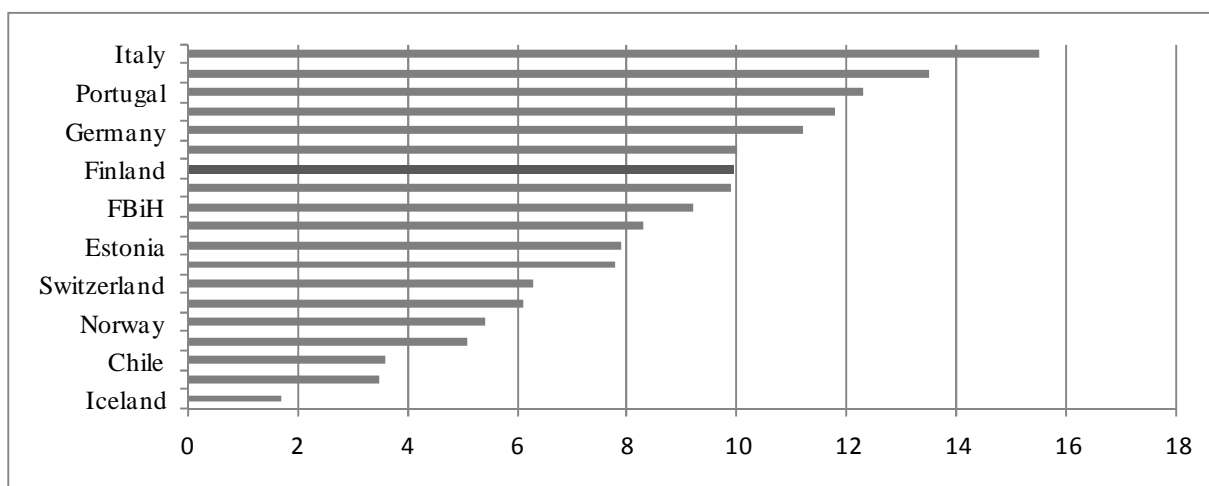


Chart 3.2. Comparison of pension expenditures shares in GDP in 2012, in the selected OECD countries and the FBiH

Source: OECD (2013) *Pension Markets in Focus*, p. 25.

* Author's estimate according to data from: Government of the FBiH (2013): *Proposed Strategy for Reform of Pension System in the Federation of Bosnia and Herzegovina*, Sarajevo

In the FBiH, the share of pension expenditures in GDP in 2010 amounted to 9.5% (Government of the FBiH, 2013). Compared with the data for 52 countries from the International Monetary Fund (IMF) study, only seven countries had higher public spending on pensions: Austria 13.9%, France 13.3%, Greece 12.1%, Italy 14.7%, Portugal 12.7%, Poland 11.3% and Ukraine 17.7% (Bađun 2012).

Chart 3.2 shows a comparison of pension expenditures shares in GDP in 2012 between the selected OECD countries and the FBiH.

affected by the aging of the population, but also by a fall in employment rate, and lower pension contributions. The main challenge for pension reforms is to create a financially sustainable system that can at the same time ensure adequate pensions and enable older people an appropriate living standard and economic independence.

Aiming for this, the EC recommends a number of measures (EC, 2012):

- link the retirement age to the increased life expectancy

- limit the possibility of early retirement
- support a longer working life through lifelong education, develop work opportunities for older employees and access to more active and healthier aging
- equalize the retirement age for men and women, and
- support development of additional forms of savings for old age.

In the part that deals with additional savings, it was highlighted that many countries have taken a series of measures to improve their pension systems by adding schemes of personal savings (the so called “models of capitalized savings”) to the existing intergenerational solidarity systems (the EC, 2012).

countries in the period from 2004 to 2025 shown in Chart 3.3. According to the projections of the Government of the FBiH from 2008, the share of pension expenditures in GDP in 2025 in the FBiH will amount to 24.93%, which is a rather unfavourable and unsustainable indicator.

There has been a considerable progress in the reforms of pension arrangements in the last decade. Most of the EU member states adjusted their pension systems in order to be sustainable on several grounds. In addition to this, the adjustment took place so that those member states would be able to overcome demographic changes currently occurring. However, the problems and challenges are still present so that more significant reform measures will be required, as well as further

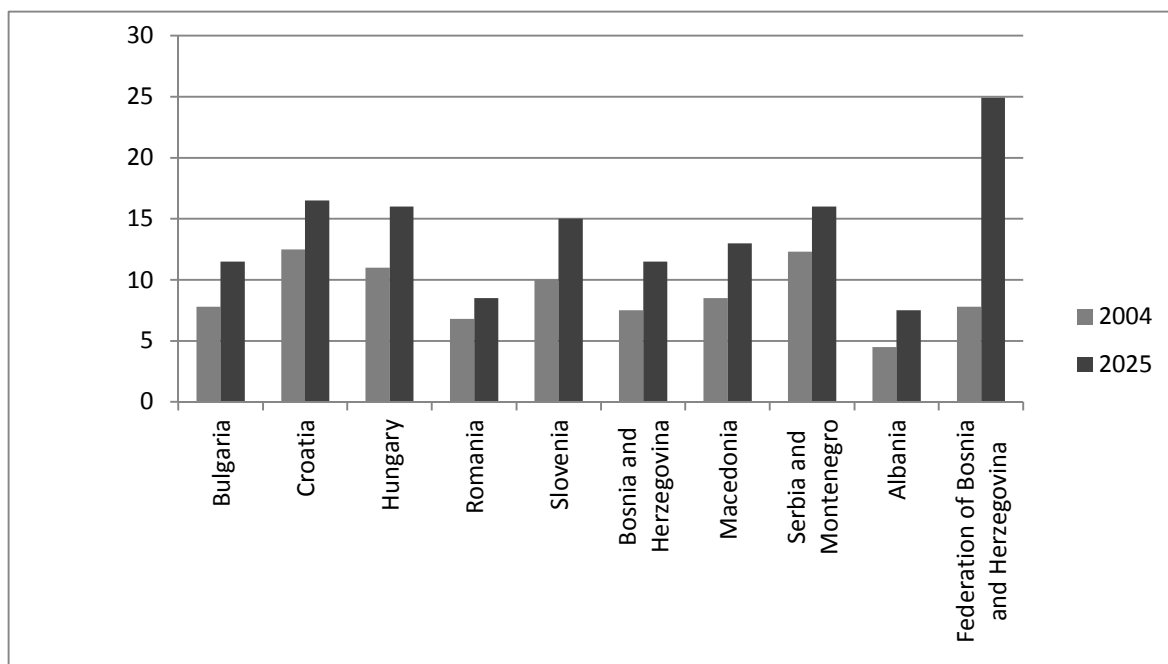


Chart 3.3. Projections of pension expenditures for the FBiH and the neighbouring countries, 2004-2025, (percentage of GDP)

Source: World Bank (2007) *From Red to Gray, Ageing and Pension Expenditures (CHAPTER 4)*, p. 160

*Source: *The Government of the FBiH (2008)*, p. 10.

It is expected that the negative trends will continue in the future, as shown in the projections of the EC from 2010 and the World Bank from 2007, which gave the projection of pension expenditures for Bosnia and Herzegovina and the neighbouring

adjustments of the system.

4. LEGAL FRAMEWORK AND KEY INDICATORS OF THE PENSION SYSTEM

Pension and disability insurance in the FBiH is regulated by the Act on Pension and Disability

Insurance (*Official Gazette of the FBiH, No. 29/98, 49/00, 32/01, 73/05, 59/06 and 29/03*). The Act is based on the principles of reciprocity, intergenerational solidarity and obligatory pension and disability insurance. The risks covered by such insurance are old age, disability, death and physical disability caused by labour. These rights are personal and inalienable; they cannot be transferred to another person or become obsolete. The Act determines the possibility of voluntary insurance for persons who are not covered by health insurance. It is this Act that represents the beginning of the pension and disability insurance reform in the FBiH.

The funds required for the actualization of rights from pension and disability insurance are provided from:

- contributions for pension and disability insurance, regulated by the Contributions Act (*Official Gazette of the FBiH, No.35/98, 54/00, 16/01, 37/01, 1/02 , 17/06 and 14/08*)
- revenue that the insurance holder reaches through activities

of the welfare system financing, represented by over 90% (Vukić and Tvrtković, 2013). Contributions for pension and disability insurance are no exception and are a key source of financing pension and disability insurance in the FBiH.

According to the data from the Federal Institute for Pension and Disability Insurance on the executed pension payments, the current state in the pension and disability system of the FBiH is described as follows:

- the number of active insured persons is 433,729, the number of pensioners is 384,123
- the minimum pension amounts to BAM 310.73, while the highest one for 127 pensioners is BAM 2,071.50
- guaranteed pension is BAM 414.30, it is received by 22,654 pensioners or 6.27% of the total pensioners number; the amount of an average pension amounts to BAM 349.95.

The pension system in the FBiH is largely funded by contributions from the category of

Table 4.1. Number of pensioners and pensions according to age (2008–2012)

Month/ year	The number of the pensioners	Chain index	Base index	An average pension	Chain index	Base index
December 2008	342,653	100.00	100.00	348.14	100	100
December 2009	356,063	103.91	103.91	342.90	98.49	98.49
December 2010	368,794	103.58	107.63	338.51	98.72	97.23
December 2011	376,180	102.00	109.78	351.69	103.89	101.02
December 2012	381,704	101.47	111.40	350.19	99.57	100.59

The base month is December of 2008.

Source: Government of the FBiH (2013), p.13. The analysis was made on the basis of the available statistical data, done by professor Snježana Musa.

- budget, and
- other sources.

Social security contributions are the fundamental source of financing social security in Bosnia and Herzegovina. This is best seen in their presence in the total sources

the employed. The contribution rate is equal to 23% of gross salary (17% of gross salary is paid by the employee and 6% is paid by the employer).

By raising the economic activity in the FBiH and with a greater discipline of taxpayers in terms of contribution payment, the revenues

of the Federal Institute for Pension and Disability Insurance grew in the period from 2002 to 2011. These revenues were collected on the basis of contributions for pension and disability insurance (Government of the FBiH, 2013).

Table 4.1 shows that the total number of pensioners in 2012 grew by 11.4% compared to 2008. At the same time, the average pension amount remained at the approximately same level. The reason for this is that with the growth of revenues from contributions, coefficients for the calculation and payment of pension also grew in the period from 2002 to 2011.

Although the average pension amount did not change in the observed period (it even slightly increased), pensions are low in their nominal value. This means they are not sufficient for the material and life need requirements of their users. The fact that over a half of the total number of pensioners receives the minimum pension contributes to this (Government of FBiH, 2013).

Table 4.2. displays the structure of paid pension according to their types (old age,

Act on Pension and Disability Insurance from 2008 regulates the pension reform in FBiH and restricts the rights provided by pension and disability insurance. Conditions for entitlement to old age pension are more stringent: new age limit is now 55 years of age for women, and 65 for men (60 before the reform). Potential pensioners are obligated to have 40 years of service, regardless of gender and age of the insured person.

In addition to all the implemented reforms and restrictions, certain conditions to obtain a pension in the FBiH remain much milder when compared with most other countries. One example for this are the conditions for early retirement.

5. POSSIBLE MODELS OF SUSTAINABLE FINANCING OF PENSION SCHEMES

The efforts to solve the issues of pension systems are focused on two main goals:

- unburden *pay as you go* system and thus all the required charges, and emphasize the development of capitalised pension savings
- appropriately regulate, shape and

Table 4.2. Structure of paid out pensions according to their types (for the period 2008-2012)

Year	Old age pensions	Participation %	Disability pensions	Participation %	Survivors benefits	Participation %	TOTAL
2008	688,253,060	50.16	272,435,942	19.86	411,342,123	29.98	1,372,031,125
2009	744,899,645	51.26	285,256,680	19.63	422,942,455	29.11	1,453,098,780
2010	766,860,102	51.63	293,465,889	19.76	425,066,230	28.62	1,485,392,221
2011	814,144,702	52.13	306,423,495	19.62	441,139,815	28.25	1,561,708,012
2012	841,220,887	52.74	307,759,117	19.29	446,133,000	27.97	1,595,113,004

Source: Government of the FBiH (2013), p.13. The analysis was made on the basis of the available statistical data, done by professor Snježana Musa.

disability and survivor's benefit). It is evident that most of the paid out pensions are old age pensions (over 50%), while the rest covers disability pensions and survivors' benefits. A portion of old age pensions has a slight increase in the period 2008-2012.

promote the system of compulsory and involuntary pension savings to ensure stability and an adequate and sustainable capitalisation of pension savings by investing in highly volatile and risky financial markets.

The priority of the pension reform in the FBiH is to strengthen the existing system of solidarity and its long-term social and financial sustainability. Consequently, the system based on capitalised pension savings is not in the focus of decision makers at the moment, although all involved parties unanimously agreed it should be introduced in the future.²

Considering the expected decline in the adequacy of pensions in the FBiH, it is expected that possible savings will focus primarily on the increase of pensions within that column.

The expenses for pension insurance are significant for state budget. Therefore, current liabilities of the pension system should be determined, as well as liabilities for the following periods and their relationship to the budget.

Further in this paper, projections of expenditures movements for pension insurance in the FBiH will be shown in three different scenarios. Also, the paper will demonstrate their impact on the sustainability of public finance and the possibility of financing from the budget.

5.1. Methodological framework

The methodological framework used in this paper is based on a study of the Institute of Economics in Zagreb from 2006 and the study by Domazet, Nikitović and Zdraković from 2012, with adjustments and specifics related to the pension system of the FBiH.

The aim of this analysis is to project pension expenditures as a share in GDP. This model is based on previously created different demographic and defined economic assumptions and projections. These mentioned demographic and economic projections present one of the limitations of this model.

Although average pension expenditures would provide more precise data, the paper uses data from total expenditures because their movement is almost equal to the one of the product of average pension expenditure projections and projections of the number of pensioners.³ The total pension expenditures include all transfers from budget for pensions that are not covered by contributions, so they are closer to the real cost.

Another limitation is the use of aggregate parameter values (GDP, pension expenditures) and a relatively long period of time that potentiates significant changes. The third limitation is the adjustment and simplification of studies on which the methodological framework is based. This can affect the quality of the results.

Notwithstanding these limitations, the paper will display possible scenarios of pension expenditures, which also combine demographic movement projections. These projections are the basis for further research of this issue in the FBiH.

5.2. The research results

The input parameters in the model are projections of real GDP growth and assumptions of pension expenditure growth rate. GDP is treated as an exogenous variable and is calculated as follows: $GDP_t = GDP_{t-1}(1 + r_t)$, where r_t presents real growth rate of GDP in the period t .

The macroeconomic assumptions used in the projections until 2017 are taken from the projections of IMF. After 2017, they tend to be moderate, which implies that the possibilities of absolute optimism and pessimism are excluded (Government of the FBiH, 2013). The real growth rate of GDP for 2013 is estimated at 0.5%, for 2014 at 2% and at 3% for the period until 2075 (Government of the FBiH 2013).

Table 5.1. Projections of GDP movements (2015-2035)

	GDP (in BAM millions)
2010	16,712
2015	18,773
2020	21,763
2025	25,230
2030	29,248
2035	33,907

Source: *Thematic Bulletin of the Agency for Statistics in Bosnia and Herzegovina and author's calculation, 2014.*

Projections for pension and disability expenditures were made for three different scenarios of the real growth movement rate of total pension expenditures.

The base scenario assumes the growth rate of total pension expenditures, whose share in GDP in 2035 is equal to the one in 2010. The afore-mentioned scenario is shown in Table 5.2.

Table 5.2. The projection of pension expenditures (2010-2035): base scenario

Year	Growth rate (%)	Pension expenditures	Pension expenditures /GDP (%)
2010	3.15	1,485,392,221	9.50
2015	3.15	1,734,551,931	9.20
2020	3.15	2,025,505,693	9.30
2025	3.15	2,365,264,044	9.37
2030	3.15	2,762,013,464	9.44
2035	3.15	3,221,165,000	9.50

Source: *Authors' calculations, 2014*

The first alternative scenario is based on the estimates of the Government of the FBiH from 2013. According to these estimates, contribution income will be kept at around 9% of GDP by 2025 because of the continuity of the present contribution rate and economic activity rate. After that, contribution income will slowly decline to 7.7% by 2035 due to unfavourable demographic trends.

Table 5.3. The projection of pension expenditures (2010-2035): first alternative scenario

Year	Growth rate (%)	Pension expenditures	Pension expenditures GDP (%)
2010	2.3	1,485,392,221	9.50
2015	2.3	1,664,252,867	8.86
2020	2.3	1,864,650,673	8.56
2025	2.3	2,089,178,996	8.28
2030	2.3	2,340,743,464	8.00
2035	2.3	2,610,839,000	7.70

Source: *Authors' calculations, 2014*

The second alternative scenario is based on the assumption that pension expenditures will grow at a pace similar to the one in the period from 2002 to 2012. According to the data from the Government of the FBiH from 2008 and 2013, the growth rate from 2002 to 2007 equals 11.63%, while in the period from 2008 to 2012 it is 3.25%. When these rates are pondered, we get a rate of 7.9%⁴.

Table 5.4. The projection of pension expenditures (2010-2035.): second alternative scenario

Year	Growth rate (%)	Pension expenditures	Pension expenditures GDP (%)
2010	7.9	1,485,392,221	9.50
2015	7.9	2,172,442,891	11.57
2020	7.9	3,177,280,753	14.60
2025	7.9	4,646,894,529	18.41
2030	7.9	6,796,260,842	23.24
2035	7.9	9,939,791,217	27.71

Source: *Authors' calculations, 2014*

Chart 5.1 shows changes in the shares of pension expenditures in GDP for the period from 2010 to 2035 for all three scenarios. It can be noticed that the differences between the base and the first alternative scenario are significant when compared to the second alternative scenario, which is based on the assumption that pension expenditures will grow at a pace similar to the one in the period from 2002 to 2012. The last scenario is the worst one.

The projections prove that pension expenditures present a great challenge for long-term sustainability of public finance.

Therefore, it is important to determine in which direction it will be moving in the future. contributions. This way, a realistic preview of spending on pensions in the FBiH is given.

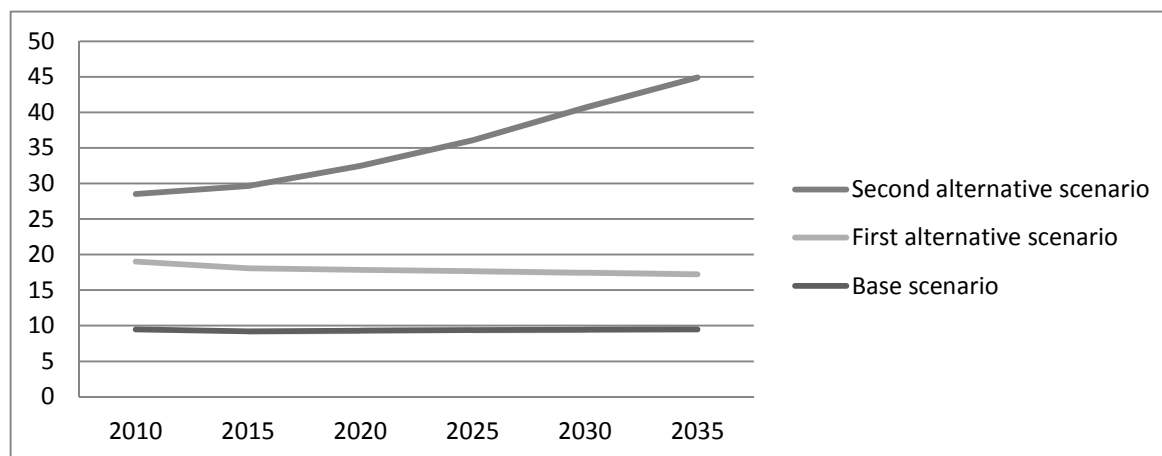


Chart 5.1. Changes in the shares of pension expenditures in GDP for all three scenarios (2010-2035)

Source: Author, 2014

If the share of pension expenditures in GDP reduces, the coverage of expenses will increase due to contributions for intergenerational solidarity pensions. This would also increase the need to finance pension expenditures by state budget. All projections are more or less sensitive to changes of assumptions on which they are based. Owing to this, many factors will influence the assumptions about the impact of pension expenditures on public finance of the FBiH. The key factors will be direction, means and pace of implementing the announced reforms of the pension system.

6. CONCLUSION

Demographic trends have a significant impact on the sustainability of public finance on a global level.

This paper analyses the issue of demographic aging and pension system in terms of sustainability of pension system public financing in the FBiH. The projections of pension expenditures were made for three different scenarios for real growth rate movement of total pension expenditures in the period from 2010 to 2035. Total pension expenditures include all transfers from budget for pensions that are not covered by

Out of the three projected scenarios, the worst one is the one based on the assumption that pension expenditures will grow at a pace similar to as the period from 2002 to 2012. In that case, the share of pension expenditures in GDP would amount to over 25% by 2035, which is unsustainable in every aspect.

No escalation of expenditures is expected, given that the FBiH is facing the most important part of the pension system reform, i.e. it is facing the selection of an appropriate pension system that will meet all criteria and satisfy all stakeholders (Government of the FBiH, 2013). Such system is somewhat delusive since it is very hard to find a suitable system for everyone among many unfavourable demographic and economic circumstances. Nevertheless, the main goal of any pension system reform is to achieve its long-term sustainability and adequate pension level, which this reform is exactly aiming at.

So far, many reforms of the pension system of the FBiH have been implemented. Last modifications of the Act from 2008, among other things, aimed at stabilizing and keeping the financial sustainability of the pension system (Government of the FBiH, 2013),

which is yet another argument in the discussion of scenarios in the future.

The election of the future model of pension system in the FBiH is the main issue of pension and disability insurance reform. In 2013, the Government of FBiH estimated that the future pension system should be modelled in *three pillars* if relevant ministries worked together with insurance holders in the FBiH. Also, this model will be achieved if international experts cooperate, with respect to the economic and social conditions in the FBiH. Lastly, a change is needed in the existing PAYG system of pension and disability insurance.

A greater stability of initial and average pensions and a stable social security of pensioners are expected with the long-term projections of the reformed pension system of the FBiH. This should result in a relatively stable share of pension expenditures of about 10% of GDP in a longer period of time, which is also one of the possible scenarios presented in this paper.

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¹ Assumptions on demographic trends from EUROPOP projection from 2008.

² In 2013, the Government of FBiH estimated that the future pension system should be modelled in *three pillars* if relevant ministries worked together with insurance holders in the FBiH. Also, this model will be achieved if international experts cooperate, with respect to the economic and social conditions in the FBiH. Lastly, a change is needed in the existing PAYG system of pension and disability insurance.

³Authors' calculations, 2014.

⁴Authors' calculations, 2014.