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MACROECONOMIC SUSTAINABILITY OF PENSION AND SOCIAL FUNDS IN BOSNIA AND HERZEGOVINA

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Abstract

The purpose of this analysis is to point to the necessity of reforming pension and social funds as a result of increase in the expected age of the population, negative demographic trends and insufficient activity of the working-age population. According to the conducted analysis of the funds in the Bosnia and Herzegovina, aging of the population will inevitably have a major impact on the operations of funds. A one-time model analyzing the equilibrium of the pension system based solely on the intergenerational solidarity in times of great technological advancement, depopulation, and an extension of life expectancy, indicates the unsustainability of funds.

Keywords: Public Expenditure, Balanced Budget, Demography, Emigration, Pay as You Go

JEL classification: C200, E240, E260, E620, H50, H51, H52, H55, J110, J130

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Abbreviations

BG – ISO code for Bulgaria

BH – Bosnia and Herzegovina

BD – District Brčko of BH

BHAS – Agency for Statistics of Bosnia and Herzegovina

BP – Bosansko-Podrinje Canton

CBBH – Central Bank of Bosnia and Herzegovina

CZ – ISO code for Czech Republic

EA – Eurozone

EC – European Commission

EU – European Union

EUROSTAT – Statistical Office of the European Union

FBH – Federation of Bosnia and Herzegovina

FIPDI – Federal Institute for Pension and Disability Insurance

FZO FBH – Health Fund of FBH

FZO RS - Health Fund of RS

FZS – Federal Statistical Office

FZZZ – Federal Agency for Employment

GDP – gross domestic product

GR – ISO code for Greece

HB – Hercegbosanska Canton

HN – Hercegovačko-neretvanska Canton

HR – ISO code for Croatia

HU – ISO code for Hungary

MK – ISO code for Macedonia

PO – Posavska Canton

RO – ISO code for Rumania

RS – Republic Srpska

RS PIDF – Republic Srpska Pension-Disability Fund

RSZ – Statistical office of RS

SA – Sarajevska Canton

SB – Srednjobosanska Canton

SI – ISO code for Slovenia

SK – ISO code for Slovakia

TU – Tuzlanska Canton

UN – United Nations

US – Unsko-sanski Canton

ZD – Zeničko-dobojska Canton

ZH – Zapadnohercegovačka Canton

ZZRS – Employment Agency of RS

1. *Introduction*

To the best of the author's knowledge, this is the first paper in Bosnia and Herzegovina that investigates the effect of demographic changes on the pension and social funds (hereinafter referred to as funds). In the previous period, the funds based their finances on extra-budgetary funding, which means that both the entity and local budgets were not directly influenced by the operations of the funds, although they always acted as a financial guarantee. Nevertheless, a steady increase in the number of pensioners, accompanied by a slower growth in the number of employees, created a financial pressure on the health and pension funds business, resulting in a shift from extra-budgetary funding to budget funding. Thus, the indirect impact of pension funds on the budget became direct, which will in the future require economic and social policy makers to adopt a more adequate strategy concerning the funds' operations. Furthermore, most EU countries continually change and develop the strategy on social and demographic policies, which further points to the necessity of reform in the social and economic system of Bosnia and Herzegovina.

In order to obtain a complete picture of the demographic changes, it is necessary to draw attention not only to the natural decline in local population, but also to the rapid trend of dislocation of the population, especially of younger age, which will in the long run create even more greater pressure on the sustainability of funds. In doing so, it is significant to point that not only the unemployed population emigrates, but also the most qualified professionals, consequently weakening the market competitiveness. The thorough reform of funds is possible only with creation of new jobs, which will lead to the reduction of emigration and to building confidence in the social protection, pension, health, and education sectors.

The aggregate and individual fund operations have been evaluated for the international sector, while the domestic sector lacked a thorough analysis with regard to shortcomings in pension and social funds. Although the operations of funds are mostly assessed to be very vulnerable, common conclusion is that systematic analysis is needed, especially in times of negative demographic trends. These problems, affecting the funds' operations, are one of the main interests of developed countries, as well of some developing countries, which is particularly evident in Europe, which has a prominent problem of depopulation and the increase in the share of elderly population.

Concerning the methodology and findings for the EU in this paper, the selected categories of funds and available data has been selected from "The Ageing Report", presented by the Economic Policy Committee and European Commission services. In addition to the EU data,

the BH database compiles the yearly frequency data in the period from 2011 to the end of 2017, based on the available cantonal, entity and state statistics. The database includes employment data, gross and net wages, demographic changes, retirement population data, pension fund types, and funds' income and expenditure data. Even though the respective agencies report elementary statements on funds' operations, the data is still inadequate for creation of a high-level quantified model, which prevents comprehensive analysis and hinders the transparency of the system itself. In addition, decentralization of the social security system, especially in the Federation of BH (FBH), complicates the functionality of the system, transparency and reporting compliance even further. The time span selected for the analysis has been determined by the availability of data on the pension system. In addition to the entity data, the analysis also includes pension funds operations on the cantonal level for FBH, which, along with the employment data by cantons, illustrate the operations of pension funds at this level. Furthermore, the Brčko District of BH (BD) and the Republic of Srpska (RS) data shows the operations of pension funds in these regions. It is important to demonstrate the effectiveness of the analysis at the regional level from which the economic and demographic activity of the regions can be determined. Besides the data for the domestic sector, the analysis includes data on the pension and social funds and demographic changes in the EU. Moreover, the data is available for new members of the EU, whose level of development can be used as a benchmark to analyze demographic and social trends in BH. In order to determine the difference in projections of developed and less-developed EU countries, average EU-level data and Eurozone data is included in the study. Comprehensive analysis of pension and social funds in the EU, which includes long-term projections of all indicators relevant to the operation of funds, sufficiently indicate the importance of establishing an adequate socio-economic strategy.

The remainder of the paper is organized as follows: Section two highlights the demographic trends, budget spending and individual funds operations in the EU. Section three presents macroeconomic overview and sustainability of funds in BH with special emphasis on the pension sector analysis where one-time model of balanced and intertemporal equilibrium conditions for pay as you go system is introduced. Future challenges and recommendations for the BH funds are presented in chapter four, while the last section offers concluding remarks.

2. *International environment*

In times when the main public focus is on high public debt, accompanied with sluggish economic and credit growth and numerous geo-political disagreements, the issue of demographic changes, especially in developing countries, has not received significant attention, although it is closely linked with many problems. Serious demographic strategy implies long-term planning, establishing legal and social security, and continual investment. Even though the focus, for most developing countries, is on short-term goals, the EU bodies are seriously concerned with aging population and demographic changes. The long-term projections have to be recognized not only by developed members, but also by countries aiming to join the European integration process.

2.1. Demographic trends in the EU

After the Second World War, which was a period of severe economic and social conditions, the next decade was marked by the "baby boom" generation. The average fertility rate, which represents the average number of children per woman per calendar year, was 2.6. Constant decline in fertility characterized the period between 1960 and 2000 (1.5), and was followed by a slight increase in fertility, as shown in the table below. Moreover, the projections of selected countries, such as the average long-term fertility projection at EU level, show a positive trend (Table 1), which is still below the sub-replacement fertility, where new generations are less populous than the older ones.

Table 1. Projected fertility trends

Country	2013	2016	2020	2040	2060
BG	1.5	1.5	1.6	1.7	1.8
CZ	1.5	1.6	1.7	1.8	1.8
HR	1.5	1.4	1.5	1.5	1.6
HU	1.4	1.5	1.6	1.7	1.8
RO	1.7	1.5	1.7	1.8	1.9
SI	1.6	1.6	1.6	1.7	1.8
SK	1.3	1.4	1.5	1.7	1.8
EU	1.6	1.6	1.7	1.7	1.8
EA	1.6	1.6	1.6	1.7	1.8

Source: EC.

The above-mentioned projection of fertility, as well as projections of the total population and life expectancy (Table 2), are in line with the economic conditions, mortality and birth rates

and the net migration of the population. It is apparent from the available that a higher degree of social security and economic prosperity prolongs life expectancy. The different dynamics of fertility rates, expected ages, and migration will significantly change the structure of the population's aging in the coming decades. According to the EC projection, the share of the EU population older than 65 years in 2070 will be 28.8%, while at the end of 2013 it was 18%. In addition to the change in the overall structure of population, the proportion of economically active and inactive population, or dependency ratio, is projected to be 51.2% in 2070, while in 2013 it was 27.8%, implying that the EU, instead of four, will have two active persons per one person over the age of 65. Given the UN projections for 2070, the EU, Japan and China will have the highest old-dependency ratio, exceeding the 50% benchmark.

Table 2. Expected total population and life expectancy

Country	2013		2016		2030		2040		2060	
	Population	Life expectancy	Population	Life expectancy	Population	Life expectancy	Population	Life expectancy	Population	Life expectancy
BG	7.3	74.6	7.1	75.2	6.4	78.2	5.9	80.2	5.2	83.9
CZ	10.5	78.2	10.6	79.5	10.7	81.4	10.5	82.9	10.3	85.8
HR	4.3	77.4	4.2	78.1	3.9	80.6	3.8	82.3	3.5	85.3
HU	9.9	75.4	9.8	76.7	9.7	79.2	9.5	81.1	9.1	84.7
RO	20.0	74.7	19.7	75.4	18.0	78.6	17.0	80.7	15.7	84.4
SI	2.1	80.2	2.1	81.0	2.1	83.1	2.1	84.4	2.0	86.9
SK	5.4	76.3	5.4	77.2	5.5	80.0	5.4	81.9	5.1	85.2
EU	507.2	80.4	510.9	81.0	524.1	83.2	528.5	84.6	524.4	87.1
EA	334.5	81.4	340.3	81.4	349.0	83.9	352.2	85.2	348.3	87.5

Source: EUROSTAT, EC. Note: Population expressed in millions.

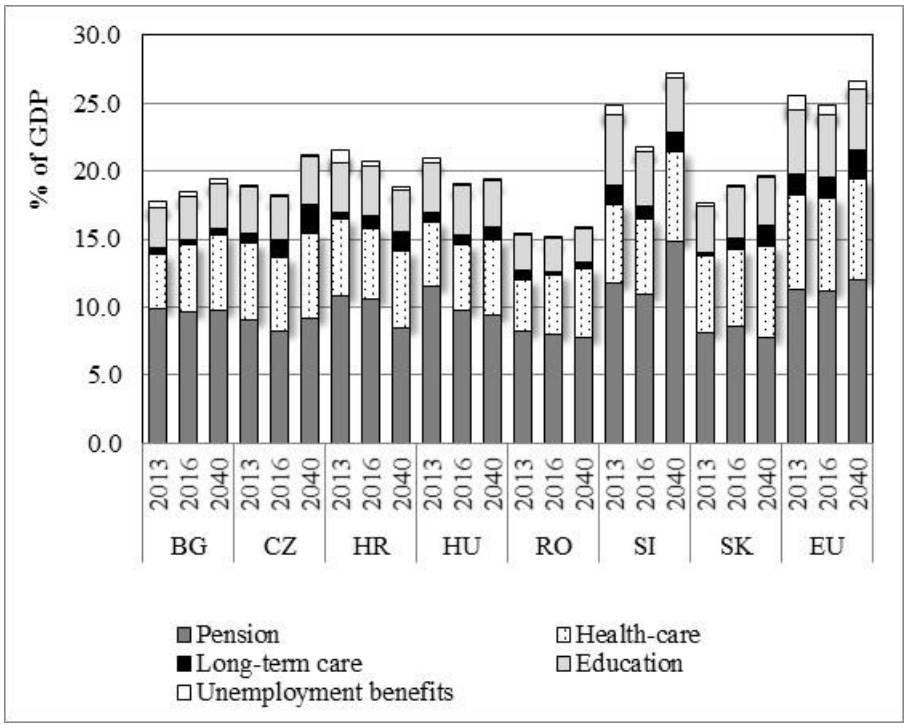
Aging population is not a new phenomenon that is only a challenge for the EU countries, because it is apparent on other continents and countries (e.g. Japan). The official statistics of the UN Population Demographics show that the share of Europeans in total population was reduced by half in the period from 1950, when it was 21.0%, to 10.6% in 2010, making it evident that the population of other continents recorded a faster growth. Likewise, the projection by the same agency expects further deterioration of this share at the end of 2060, resulting in a decline to 6.9% of the total population. Furthermore, according to the dependency ratio, Europe is currently the oldest continent. Projection of this indicator illustrates that Europe will keep this status in the future.

2.2. Budget spending in the EU

As noted, the demographic changes pose a challenge for public spending, especially the expenditure of pension and social funds. In the coming decades, the effect of population aging

will have a significant impact on pensions, health and long-term care, education, and unemployment benefits (Graph 1). According to the long-term projection of the EU budget spending, population aging affects expenditure growth by 1.2% of GDP in 2040.

Graph 1. Structure of budgetary expenditure



Source: EC.

Looking at the country's cost trends, there are significant differences in the trends observed across countries, where largely developed countries have a greater impact on the total cost increase at the EU level. Reduction in budget spending for some countries is due to lower share of pension costs, which is the result of not only the GDP growth[1] but also of pension reforms. These reforms in most countries imply an increase in retirement age. However, these assumptions of long-term projections entail temporary retirement legislation, so any increase in pensions or the reduction of retirement age can further increase the budget expenses. As for other social funds, the prolongation of life expectancy is closely related to the greater need for health and long-term care, hence increasing the costs of health services. The expected increase in health and long-term care costs at the end of 2040 is 0.8% and 0.7% respectively, while education and unemployment costs at the EU level are lower by 0.2% and 0.4% respectively.

[1] According to the EC, the average annual GDP growth rate is projected to be quite stable over the long-term, at 1.4% on average up to 2070.

2.2.1. Pension funds in the EU

Aging of the population has a crucial impact on pension funds, thus, projection of pension expenditures represents a strategic decision to create a budget policy. The EU pension system is characterized by the existence of various public and private funds. The focus of the analysis is on an exclusive sample of public funds, which are directly influenced by demographic changes, while projection of private funds is more linked to the macroeconomic fundamentals and the risk aversion, which makes long-term projections of private funds less reliable. Although there are differences in the policies of the EU public funds, aging population issues are universal for all countries. Following the recent reforms, prompted by rising pension costs and worse predictions, most EU members' countries have begun to evaluate pensions by the total years of service, while in the previous decades the calculation of pension took a certain lifetime period (e.g. ten years before the retirement). As a result, the distribution of pensions was unfair, especially for people who paid a significant amount of the contribution throughout their working life. Likewise, reforms that penalize early retirement, as well as remuneration for the extension of working life, have been introduced to alleviate the pressure on increasing number of pensioners.

In addition to these reforms, the average age of retirement at the EU level at the end of 2016 was 63.4 for males, and 62.6 for females. The projection of retirement age at the end of 2030 will increase the indicator by one year, while at the end of 2070 it will be higher in comparison to the base year by 2.1 and 2.4 years for males and females respectively. Taking into account the retirement age, the average duration in 2017 for males was 18.6 years, while for females it was 23.1 years. Further projections indicate that the retirement age will increase in the coming decades despite the shift in working life. At the end of 2070, duration of retirement will extend by 4.0 years for males, and by 3.2 years for females. Bearing in mind the aforementioned forecasts, the pension-related spending will grow rapidly, with the costs further influenced by change in the age structure and inadequate growth of the total number of insured persons.

The contributions paid to the pension system by employees, voluntary insurers and companies represent the future fundamentals in tuning the potential pension fund deficit. At the end of 2013, total contributions measured relative to GDP were 9.6%, with projected increase of 0.3 percentage points at the end of 2060, mainly due to the increase in contributions and the number of insured persons in more developed countries. The expected contributions do not adequately amortize pension expenditures of public funds, resulting in the budget spending increase.

Expected trends of insurants and pensioners in the coming decades (Table 3) in particular point to the importance of a pension strategy for new member countries, as it is apparent that long-term projections of the insured people are relatively constant, while the expected number of pensioners for most member countries is considerably larger.

Table 3. Projection of contributors and pensioners

Country	Contributors					Pensioners				
	2013	2016	2030	2040	2060	2013	2016	2030	2040	2060
BG	2,730	2,765	2,537	2,269	1,814	2,196	2,181	2,031	1,899	1,780
CZ	4,935	5,145	4,840	4,588	4,099	2,882	2,907	3,053	3,291	3,539
HR	1,453	1,453	1,400	1,386	1,258	1,218	1,233	1,244	1,172	1,154
HU	3,978	4,349	4,572	4,296	3,812	2,806	2,542	2,720	2,928	3,087
RO	5,948	5,591	5,429	4,728	4,295	5,392	5,152	5,131	5,527	5,467
SI	833	891	860	810	748	606	616	721	790	775
SK	2,313	2,176	2,122	2,036	1,800	1,322	1,364	1,480	1,558	1,673
EU	-	182,617	186,297	181,034	173,098	124,008	128,045	144,692	158,173	162,639
EA	135,675	140,579	145,613	142,747	139,695	83,478	87,790	101,083	110,600	111,562

Source: EC.

When looking at the data on the expected trends of insured and retired persons, it is clear that the coverage ratio for individual member countries in the coming decades will be less than one, which means that there will be more pensioners than contributors. At the end of 2013, the average ratio for selected countries[2] was 1.39, while at the end of 2060, it is 1.06. Considering the coverage ratio for the more developed member countries, the indicator at the beginning of the initial period is 1.63, with a decline of the ratio at the end of 2060 to 1.29.

2.2.2. Health and long-term care in the EU

Complexity of the health sector is reflected in the presence of a moral hazard, where insured persons can use unnecessary services, as they do not bear the cost of treatment, and asymmetric information, where doctors have more information than patients, and this further exaggerates the forecast for this sector. However, long-term projections, which can be taken with reservations, serve to set up a strategy and to monitor key health costs. The average EU health care spending in 2016 was 17.1% of the total government spending, which highlights the pressure that this sector puts on fiscal policy.

Looking at the factors that increase the cost of health care, special attention is paid to the risks of prolonged life expectancy with lower self-care, increasing the need for frequent services,

[2] BG, CZ, HR, HU, RO, SI and SK.

and the inadequate number of insured persons, which cannot compensate for all the necessary costs associated with the general aging of the population. Although technology has progressed significantly in the past decades, enabling the treatment of many previously severe diseases, the problem of individual health preservation has not been resolved, which is best reflected in reduced activity and neglect of the importance of good nutrition.

Total expenditure on health and long-term care in the EU at end of 2016 equaled 8.4% of the GDP, while the average spending for newer member countries was 4.8%. Looking at the long-term projections, there is an increase of 2.1% in 2070 at the EU level, while new members are expected to have an increase of 0.9 percentage points. Preciseness of this projection is not only conditioned by the aging of the population, but also by numerous other factors. The analysis carried out by the EC has determined that if the past trends persist, the non-demographic factors will mostly affect the movement of the total health sector spending. The fact that spending in the more developed countries is higher in absolute and percentage terms when compared to the new EU member states, indicates that a higher standard of living compels the public administration to invest more in the healthcare services. In addition, a rise in the standard of living changes the people's perception of a healthier lifestyle, and creates a framework for a longer lifespan.

Long-term care represents a wide range of services required by individuals with lower functional capacity, psychological or cognitive, who are consequently long-term dependable on day-to-day assistance. While the healthcare cost rise is not necessarily related to aging, long-term care costs are mostly caused by prolonged life, thus increasing the risk of physical and mental illness for older people. As already mentioned, the dependency ratio in the future will almost double, especially including children up to the age of 14, who also depend on the active population (between 15 and 65), and will reach the total age dependence of 78.0% in 2070; therefore, it is reasonable to expect higher demand for long-term care in the decades to come.

2.2.3. Education sector in the EU

Depopulation and negative demographic trends will heavily influence the rate of enrollment in education. However, there are many other factors influencing budget spending that are related to education, such as duration of compulsory education, government investment in the education system, enrollment progress in the secondary and tertiary education, relative wages in the education system, and the average size of classes. Looking at the demographic changes alone, assuming that the educational policy will not change, expectations are that the budget

spending will be reduced by 0.1 percentage points, which is mostly due to lower primary and secondary education costs because of a lower student enrollment. As regards the expenditure structure of education, it is noticeable that gross wages and salaries account for the largest share of costs (61.8%), while other expenses, tranches and capital investments take up 21.4%, 9.3% and 7.5%, respectively.

2.2.4. Unemployment benefits in the EU

Despite the fact that the unemployment benefit is not closely related to the age of the population, but rather to the short-term cyclical fluctuations and structural factors of the labor market, incorporating it into the long-term projection of the budget expenditure gives a complete picture of the challenges social funds will face in the upcoming period. Past trends, especially at times of sudden crisis, indicate how unpredictable long-term projections of unemployment are. According to the official data from 2005, the average unemployment benefit in the EU measured in the total GDP was 0.7%, while at the end of 2010, it grew by 0.2 percentage points, following the global economic crisis. Furthermore, growth in expenses was particularly pronounced in the countries most affected by the economic crisis, with Greece, Ireland and Spain registering costs for unemployment higher by 0.4, 1.8 and 1.1 percentage points respectively. Although it is notable that the above-mentioned countries recorded costs higher than the average EU-level costs, some countries, such as Germany and Sweden, significantly reduced the same type of costs over the same period, thus reducing the growth in total costs. Under the assumption that long-term unemployment will drop with a rise in GDP, the trend of budget spending will decrease in the coming decades, compared to the base year 2016, when it was 0.8%.

3. Sustainability of pension and social funds in BH

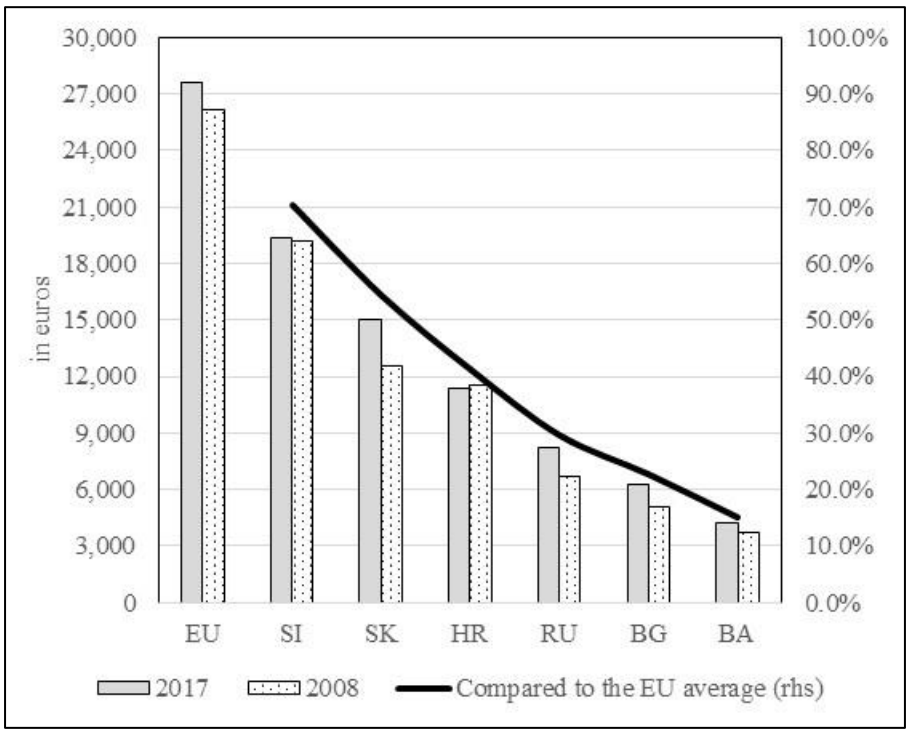
Data on the EU budget expenditures indicates issues and challenges that the creators of socio-economic strategy in Bosnia and Herzegovina will face. In an environment where the short-term vision is based on political compromises and the system is complex, projecting socio-economic trends is an almost impossible task. Long-term projections, as an instrument of a more adequate planning, are not so necessary in the case of BH, because the current state of the pension and social funds is already alarming, so any delay in the reform will further expose the already instable funds. In addition to the existing problems that the funds face, reflected in the insufficient contributions, high share of grey economy, highly decentralized system and the

insufficiently skilled labor force, BH will also have to face the same challenges that the EU countries are facing, if not greater.

3.1. Macroeconomic overview in BH

Analysis of the pension and social funds is mainly focused on the factors that pressure the sustainability of funds, since analysis of the BH economy has been presented in numerous reports evaluated both by domestic and international authorities. However, it is crucial to indicate some real factors that influenced high emigration, inadequate pensions, and insufficient investment in health care and education sector. Looking at the trend of real GDP per capita (Graph 2) it is evident that some countries still have not reached the pre-crisis levels of this indicator. At the same time, there is large gap between the average EU levels and the levels in the selected countries. This indicator in BH was 15.2% of the average EU level at the end of previous year, suggesting inferiority for converging to the more developed countries. In addition, the unfavorable structure of economy, low productivity, high share of public administration, and high unemployment caused slow economic recovery in BH.

Graph 2: Real GDP per capita in the selected countries



Source: EUROSTAT, BHAS.

According to the ILO methodology, unemployment rate in 2017 was 20.5%, and compared to the previous year, it was lower by 4.9%. Youth unemployment in the previous year was 46.4%

and it decreased by 7.9% when compared to the year before. In order to encourage higher employment among young people, educational needs and demographic changes should be strategically recognized. As part of the Euro 2020 Strategy, which puts forward mutually reinforcing priorities for smart, sustainable and inclusive growth, one of the headline targets is to increase employment rate of the population aged 20-64 to at least 75% (Table 4). It is evident from the figures below that there is a discrepancy in employment rates between countries within the EU. Considering the BH data, the share of inactive people is substantially higher than in the EU countries.

Table 4. Employment rate of the population aged 20 to 64

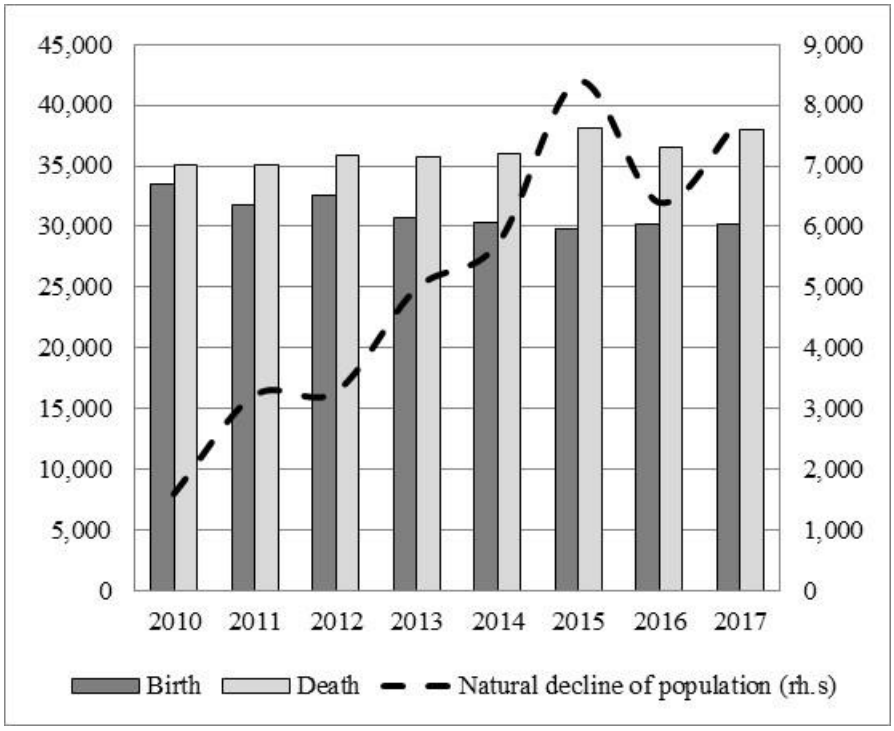
Country	2008	2012	2016	Target-2020
BA*	40,7%	38,5%	40,2%	44,0%
BG	70,7%	63,0%	67,7%	76,0%
GR	66,3%	55,0%	56,2%	70,0%
HR	64,9%	58,1%	61,4%	62,9%
SI	73,0%	68,3%	70,1%	75,0%
SK	68,8%	65,1%	69,8%	72,0%
EU	70,3%	68,4%	71,1%	75,0%

Source: Eurostat, BHAS. Note: Data for Bosnia and Herzegovina take into account age group 15-64, while official data for 2018 represents the target data for 2020.

3.2. Demographic trends in BH

There has been a clear natural decline of the population in BH in the previous period, despite the prolonged life span. The data presented (Graph 3) indicate that in the reviewed period, the number of deceased persons had slightly increased, while the total number of births had declined, with an increasingly intense trend. When the official data in the previous year is compared with the data from twenty years ago, birth rate decreased by 37.6% while the death rate increased by 36.2% over the same time period. Moreover, it is clear that demographic changes for policy makers and society in general will be a short- and long-term challenge, and will require creation of a new strategy for economic, social, tax, educational, health, pension, and other policies.

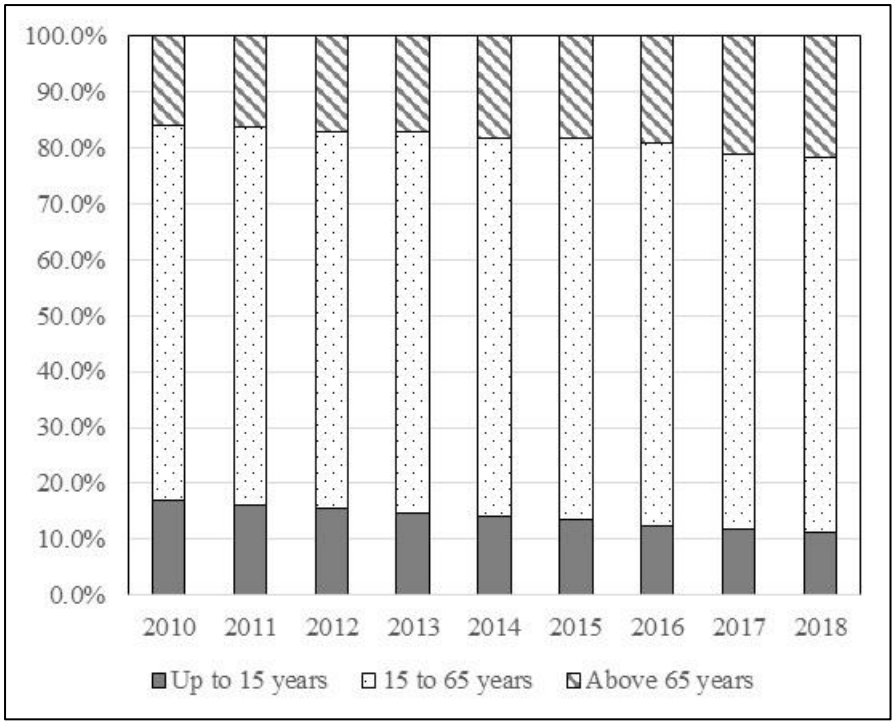
Graph 3. Demographic trends of population in BH



Source: BHAS

From 2010 through 2018, age group above 65 has grown by 5.9% (Graph 4), because of the increase in life expectancy. Considering the number of children below 15 in the same period, their share in the overall population is lower by 5.7%, which will in the long run increase the costs of the pension and health care system. Moreover, high number of emigrants to the more developed countries may affect the labor force shortage, especially in the sectors requiring highly skilled workers.

Graph 4. Age structure in BH



Source: BHAS

Although the official data on demographic changes do not include external migration, it is clear that lower economic standards and high unemployment, especially among young people, contribute to the rapid trend of population dislocation. Furthermore, after Croatia joined the EU, citizens of BH with dual citizenship use the possibility of easier employment in certain EU countries, where no work permit is required, and this resulted in further reduction of the population in BH. Besides that, some EU countries announced that they would accept workers from non-EU countries without administrative barriers, which may also foster emigration in the next years. Significant demographic changes occurred in a relatively short period, reflected in a negative natural increase and an increasing number of emigrants, which is likely to have implications for aggregate consumption, investment, public spending, and economic growth itself. According to the projection by the non-governmental organization "Union for Sustainable Return and Integration in Bosnia and Herzegovina", in the last five years, 150 thousand residents emigrated to the more developed countries, which caused depopulation of 5.2% during this period. Moreover, not only does the unemployed population emigrate, but so does the highly skilled labor force, especially medical professionals, which will in the long-run create even higher pressure on the sustainability of the health care and pension funds. In the situation where the likelihood of reverse migration is low. shortage of skilled workforce will be the crucial challenge for policy makers and for the long-term growth prospects.

Growth in the expected age of the population, along with the already mentioned demographic changes, further complicates the operations of the funds, whose operating costs are constantly on the rise. Bearing in mind that the average age of the deceased in 2000 was 66.8 years (69.7 for women, 64.2 for men), while in 2017 it was 73.9 years (76.5 for women; 71.2 for men) it is obvious that the expected age in the observed period has increased by 7 years. Likewise, the projected life expectancy (Table 5) points to the long-term budgetary pressure due to life span extension. By comparing the age of the population in BH with the average age in selected EU member countries, it is obvious that the average lifespan is longer in the selected member countries, by 4 years on average, while the average life expectancy is significantly higher if data for other EU members is included. If these demographic trends, above all the low fertility, continue, this will cause an even faster decline in the total population and an increase in the share of the age group over 65 years old.

The fertility rate in BH is the lowest not only in the region, but also in comparison to the most EU members, and was 1.26 at the end of 2017. This data clearly shows that demographic changes in Bosnia and Herzegovina are reflected in the increasingly unfavorable relationship between functional age contingents (pre-employment, work and post-employment contingents).

Table 5. Projected life expectancy

Country	2013			2016			2030			2040			2060		
	Total	M	F	Total	M	F	Total	M	F	Total	M	F	Total	M	F
BA*	72.7	70.0	75.5	73.4	70.7	76.2	75.8	73.3	78.5	77.5	75.2	80.0	80.6	78.6	82.7
EU	80.4	77.6	83.1	81.0	78.3	83.7	83.2	80.7	85.6	84.6	82.2	86.9	87.1	84.9	89.2
EU-selected countries	76.7	73.3	80.0	77.6	74.4	80.7	80.1	77.2	83.1	81.9	79.2	84.7	85.1	82.7	87.6

Source: EC, BHAS. Note: Projection for BA considers the moving average of EU selected countries in the next decades. EU-selected countries are BG, CZ, HR, HU, RO, SI and SK.

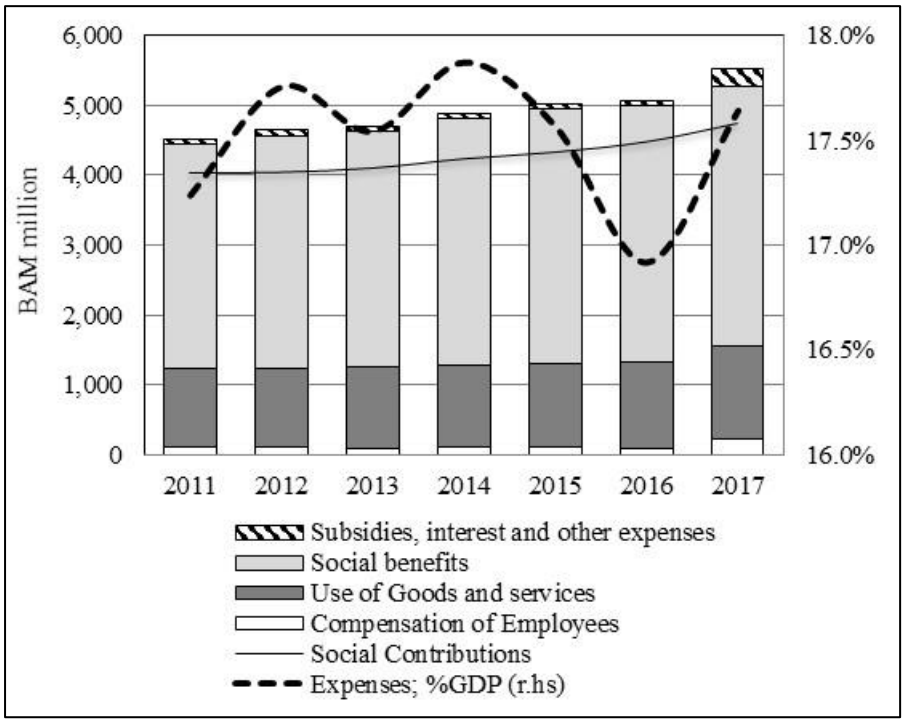
3.3. Budgetary expenditure in BH

Issues of pension and social funds in BH do not come down solely to the impact of aging and general depopulation, but also to the lack of transparency and high decentralization of the system. In case that BH acquires the long-awaited EU membership candidate status, all funds and statistical agencies will face major challenges in terms of consolidated reporting. In addition, some sectors will have to align statistical reporting that is significantly different if data is extracted from different sources. Likewise, exclusion of certain categories of insurance

significantly distorts the overall picture, which is particularly evident in the case of health insurance funds that do not include the entire health sector in the reports sent to relevant institutions.

The average public budget spending shown in Graph 5 indicates annual data on revenues from social contributions and expenditures of pension and health insurance funds, employment, disability and child protection fund in RS. It is evident from the listed funds that there are differences among the categories of funds, which thus points to the discrepancy between economic and social policies. Official data of the public funds indicates a slight growth in operating costs, which is mostly due to increased social benefits. At the end of 2016, the average budgetary spending was 16.9% of GDP, which means that spending of funds in BH was higher by 1.9 percentage points than spending of new EU member states. At the same time, spending is lower by 3.5 percentage points when compared to the average EU spending, considering that the data on the EU education system is excluded since it is not included in the BH fund data.

Graph 5. Contributions and expenditure structure of funds in BH



Source: CBBH.

However, in order to make a more reliable comparison between pension and social funds in BH and the EU funds, individual funds in BH will be analyzed in detail. Despite the fact that official statistics is very infrequent, especially for the education and health sector, the results

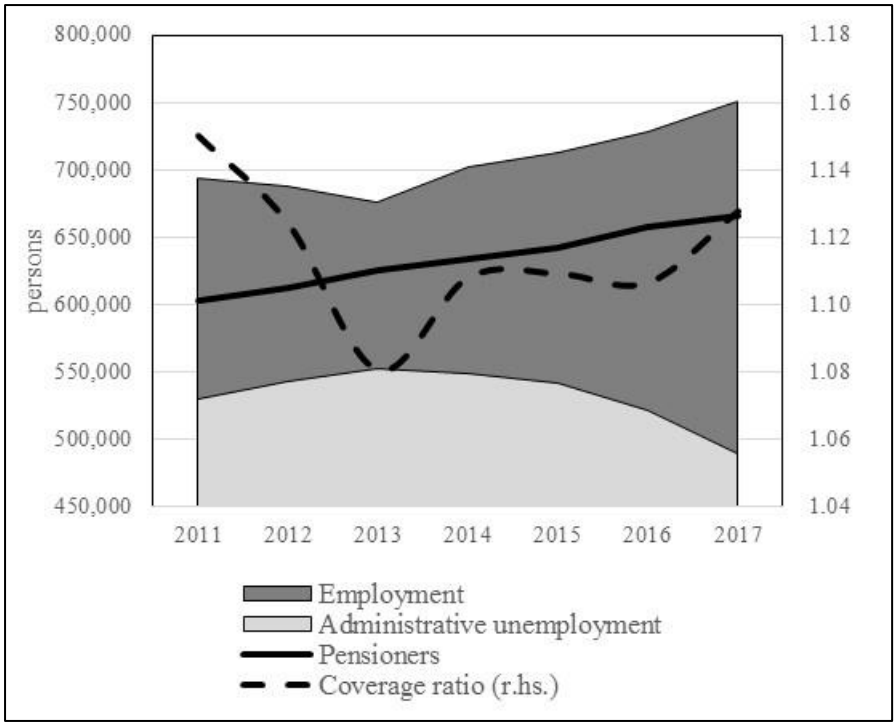
show a significant budgetary spending in BH. When estimates of spending on the education are included, the budgetary spending of funds amounts to 21.2% of GDP, which is again below the EU average consumption, as this ratio at the EU level for the same year was 24.9% of GDP. It is also significantly higher than in new EU member states. However, this ratio is still underestimated, because part of the health sector in BH does not submit the necessary documents. The budget spending ratios show the economic and social importance of funds, and point to the necessary reforms of pension and social funds as a result of demographic changes and the poor work activities of the population in BH.

3.3.1. Pension system in BH

Announcement of the reform of the pension system, which includes, inter alia, a later period of retirement and the abolishment of early retirement, meant a significant increase in the number of employees at the end of 2015. In addition, the pension fund in the RS moved from extra-budget to budget funding as the fund's revenues could not provide payments on time and social peace to the retired population. This was followed by adoption of the new law in the FBH. As for the differences in retirement age, the average for men in the EU is 63.6 years, while for women, the average is 62.6 years. Although there is no official data on retirement age at the BH level, it is clear that the current maximum age of 65 for men and 60 for women, taking into account the high level of early retirement, also indicates a large difference in average working period.

The BH pension system, based on inter-generational solidarity, is organized at the entity level, where fund operations are fundamentally and legally different, as is the tax rate from which contributions for pension funds are collected. The taxable pay in the FBH is 23%, while in the RS it is 18.5%. Although the legislation, as well as direct taxes, are not harmonized, funds' operations in the previous years recorded the same trend, which is reflected in the increase in the number of pensioners, with a slower increase in employees. For this reason, considerable pressure was placed not only on the budgets of the funds, but also on the budgets of the entities, which partly financed the funds' deficit. Graph six shows the deterioration of the coverage ratio, which at the BH level is 1.13 employees per pensioner, between 2011 and 2017 as a result of a faster growth the number of pensioners. In the observed period, the number of employees increased by 8.3%, while the number of pensioners increased by 10.5%.

Graph 6. Coverage ratio of pension funds



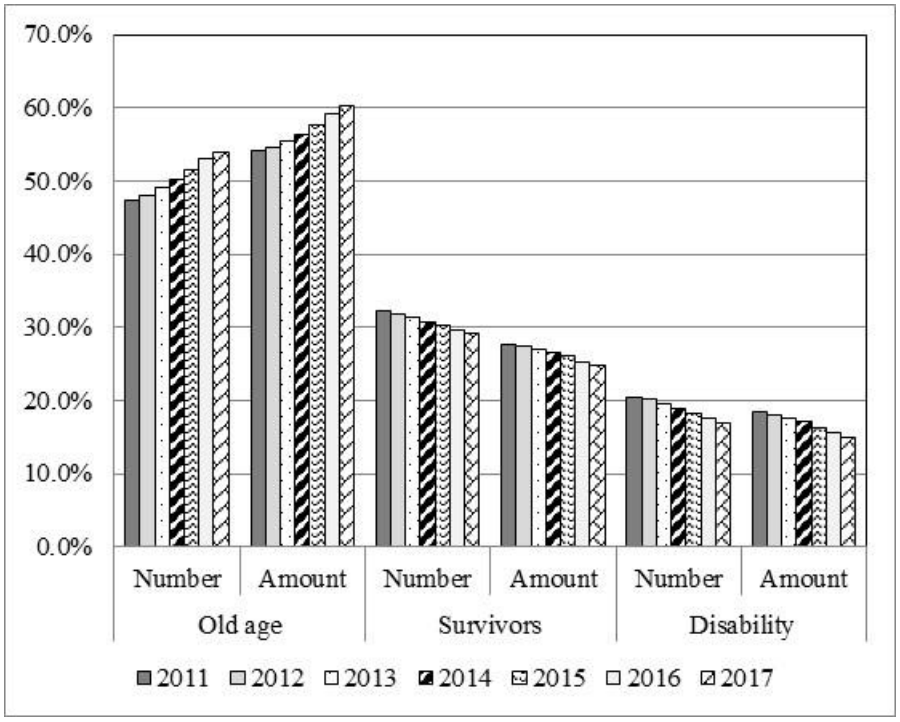
Source: FIPDI, RS PIDF, BHAS, own calculations.

The intergenerational solidarity implies the financing of pensions from individual contributions. This system was introduced at the beginning of the 20th century, in line with the then trends and technological progress, as well as the life expectancy of the population. Numerous countries have extended the existing system over the last century by including voluntary pension funds, generating a risk dispersion and diversification of pension funds' portfolio. Private pension funds operate on the principle of capitalized savings, by balancing contributions with their obligations, in order to ensure the stability of the system. On the other hand, in the public funds based on intergenerational solidarity, the equilibrium only corresponds to the theory, which is particularly evident in times of major demographic changes. The key difference between these systems is in the fact that private funds are resistant to demographic changes, while they are under influence of economic cycles. In the case of pension funds based on intergenerational solidarity, they are resistant to economic changes, while under significant influence of demographic changes. In a period of economic expansion, as well as the growth of stock indexes and interest rates, private pension funds recorded a significant growth, thus making a significant return on the paid savings of working-active population. After the stagnation of the world economy, unprecedented low interest rates on savings and high quality government bonds, pension funds faced another challenge, alongside the already mentioned demographic challenge.

Reform of the pension system in BH, which is harmonized with most pension systems in the region, implies the formation of mandatory and voluntary funds, which will be based on capitalized savings. However, it is highly certain that the economic cycle does not correspond to the period of establishment, which can further complicate operations of new funds. Likewise, question arises as to how private funds could survive, as it is obvious that contributions to the so-called "first pillar", based on intergenerational solidarity, cannot be allocated to private funds, since the functioning of public funds is uncertain without any deduction of the contributions. Introducing new contributions to finance the so-called "second pillar", the capitalized savings fund, would further burden the economy, which could lead to an increase in the informal economy. In addition, the increase in contributions will burden public administration and state-owned companies that are the largest debtors of pension and social funds. The voluntary fund business is not only conditioned by the economic cycle, but also by the economic standard of the population, which makes the profitability of new funds even more vulnerable.

Considering the types of pension (Graph 7), it is evident that there is a significant share of family or survivors and disability pensions, as the result of war. However, there is a suspicion that a certain number of retirees in these groups have illegally acquired a pension, which negatively reflected on funds' budgets. At the end of 2017, old-age pensions accounted for 60.3% of the total pensions, which is moderately low in comparison with other countries due to the already mentioned shares of other types of pensions. It is also evident that old-age pensions are the only ones with a positive growth trend over the years, which is the result of not only a drop in other groups, but also of the growth of the base for calculating old-age pensions, resulting from a longer time frame, especially in the public sector.

Graph 7. Structure of pension system



Source: FIPDI, RS PIDF.

Regarding the group's share in GDP, there are significant differences between the EU members and BH (Table 6). The only pension structure in Croatia approximates the structure of BH, which has also been influenced by the war. Likewise, expectation of new members for 2020 implies a lower share of retirement expenditure, while the same indicator for developed countries is constant. Looking at the data for BH at the end of 2017, the expenditures for old age and disability pensions are slightly higher than in the previous year (0.5%, 0.7% respectively), while survivors' pensions grow by 4.5%. Even though it is apparent that the share of expenditure in GDP declines over years, mainly due to the raise in overall economic activity, by adding salaries and benefits of fund employees, as well as health insurance for retirees and other expenses, the share of total pension funds expenditure would increase.

Table 6. Pension structure comparison with EU, as % of GDP

Country	Old-age			Survivors			Disability			Total		
	2013	2016	2020	2013	2016	2020	2013	2016	2020	2013	2016	2020
BG	7.9	7.7	7.1	0.3	0.3	0.3	1.3	1.3	1.5	9.5	9.6	9.1
CZ	7.3	6.8	6.7	0.7	0.5	0.6	1.1	0.9	0.8	9.1	8.2	8.1
HR	5.1	6.9	6.9	1.6	1.8	1.7	2.5	1.8	1.8	9.2	10.6	10.4
HU	9.1	8.0	7.4	1.3	0.9	0.8	1.0	0.7	0.7	11.4	9.7	9.0
RO	6.9	5.9	5.4	0.4	0.4	0.4	0.8	0.6	0.6	8.1	8.0	7.3
SI	9.1	8.3	8.5	1.2	1.3	1.2	1.3	1.3	1.2	11.6	10.9	11.0
SK	6.1	6.7	6.5	0.9	0.8	0.8	1.0	0.9	0.9	8.0	8.6	8.3
EU	8.5	8.6	8.7	1.6	1.2	1.2	0.7	0.8	0.8	10.8	11.2	11.1
EA	9.1	9.6	9.7	1.7	1.7	1.6	0.8	0.9	0.9	11.6	12.3	12.3
BA*	5.2	5.5	5.3	2.5	2.4	2.4	1.6	1.4	1.4	9.4	9.3	9.1

Source: EC, BHAS, FIPDI, RS PIDF. *Note: Expected results for BA in 2020 represent official data at the end of 2017.

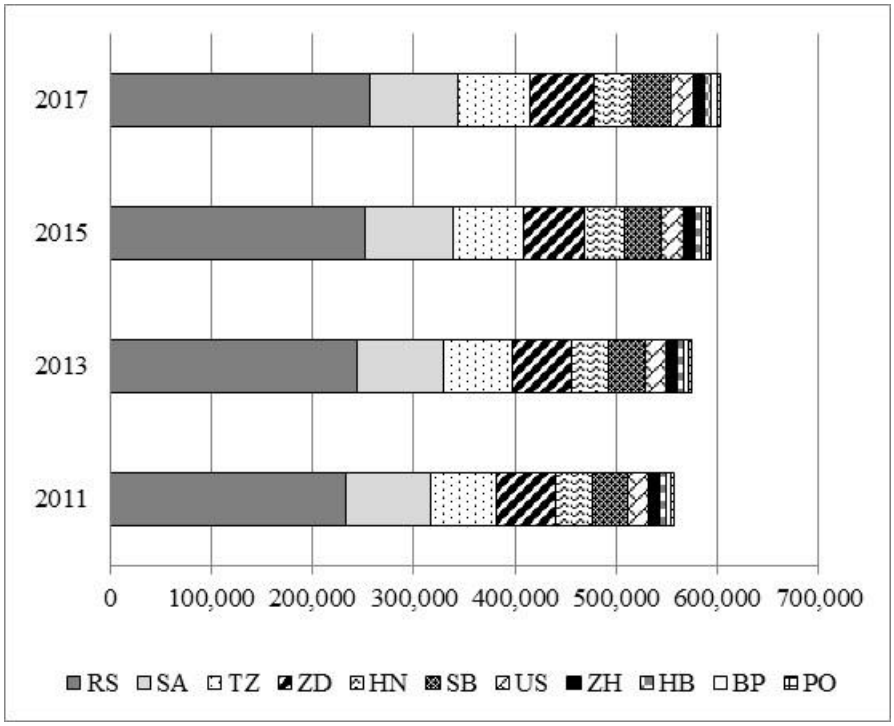
Box 1. Pension spending by regions in BH

In spite of the fact that pension system in BH is organized at the entity level, official data of the FIPDI allows the distribution of pension expenditures to cantons, which, together with data on employment and gross wages, can be used to estimate contributions and expenditures by counties. This shows the different economic activity in the regions. Regarding the data for the FBH, it is broken down by paying regions, meaning by cantons or other locations inside or outside BH. There are significant differences in statistical reporting between entities, so it is necessary to harmonize the funds' reporting in the future.

Movement of total pensions and employees by regions indicates a growing trend of these items, with pensions (Graph 8) having a faster growth trend than employees up to 2015, while at the end of 2017, the number of employees increased at a higher rate (Graph 9). Considering the change in pensions by regions at the end of 2017, compared to the beginning of 2011, the highest increase of 13.1% was recorded by PO, followed by RS 10.2%; ZD 7.9%; and TZ 7.8%, etc. The lowest increase is recorded by SA with 4.8%. As already mentioned, FIPDI submits a report by paying regions, not only in the FBH, but also in the rest of the country and abroad. Due to the inability to access similar data for the RS, the displayed graphs do not include the movement of pensioners by their place of residence for the BD and abroad. However, FIPDI data shows that the highest percentage increase was recorded for pensioners abroad, which amounts to 33.8% over a six-year period. Looking at the absolute figures, 49,834 pensioners lived abroad at the end of 2017, which places this pay-off region, based on the number of

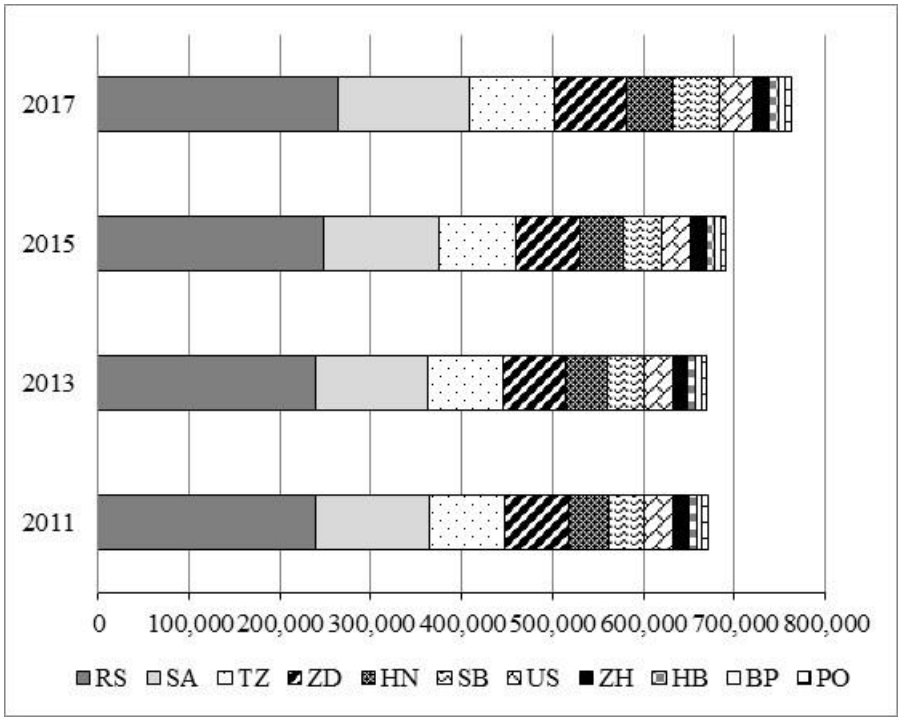
pensioners in the FBH, immediately after SA, TZ and ZD, while all other cantons have fewer pension beneficiaries. Increase in the number of pensioners abroad represents not only increased expenditure for the fund, but also weaker domestic consumption, as it is directed to the countries where they currently reside. In addition, by including data on foreign expenditures for the RS, the number of beneficiaries is increasing, and as a result, the outflow of capital from BH. According to the balance of payment statistics (CBBH), the social benefits outflow in the previous year increased by 7.0% on yearly level.

Graph 8. Number of pensioners by regions



Source: FIPDI, RS PIDF, BHAS. Note: The RS is an entity, while the above-mentioned cantons constitute the entity of the FBH.

Graph 9. Number of employees by regions



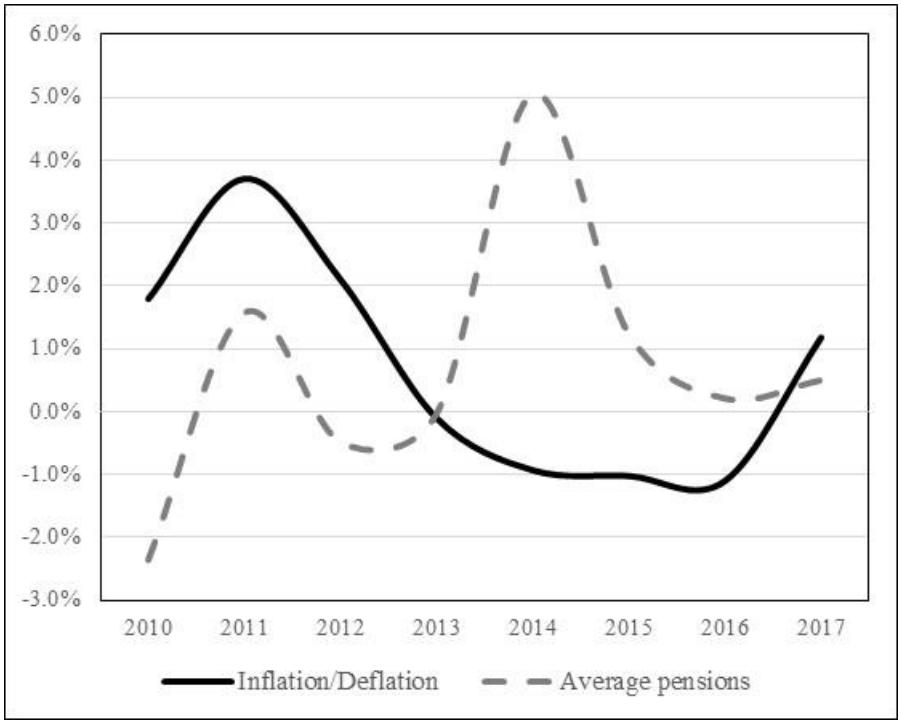
Source: FZS, RZS.

Regarding the coverage ratio by region, PO, US, and SA have the greatest ratios, and at the end of 2017, they were 1.72, 1.68 and 1.65 respectively. The lowest ratios among cantons have the ZD and BP, where the ratio is 1.28. Taking into consideration the entity data, coverage ratio for the FBH and RS is 1.22 and 1.03, respectively. It is clear that the number of pensioners in some regions is close to the number of employees, which in turn indicates a certain economic imbalance in the regions. Available data on pension expenditures by regions, employees, and gross wages are used to show the difference in the payment of contributions in comparison to the cost of pensions. According to the available data, the income from contributions is less than the cost of pensions for most regions. The most positive balance has been achieved in the SA, where the most positive balance has also been recorded in the natural increase of population; however, one needs to bear in mind that a large number of public institutions and publicly owned companies, situated in the capital, have a major influence on this indicator.

As for the current fund revenues, funds in BH largely depend on the payment of contributions, which, despite the increase in gross salaries and number of employees still insufficiently compensate for the increase in payment of pensions. In addition to the already mentioned growth in the number of retired persons, the total fund expenditures are negatively influenced by the increase in average pension during that period, which is largely reflected by the increase in the retirement coefficient, thus adjusting retirement pensions in the past, albeit insufficiently, to an increase in inflation (Graph 10). Normally, most EU countries align pensions with

changes in wages, prices, and GDP, which will also be a challenge for pension funds in the coming period.

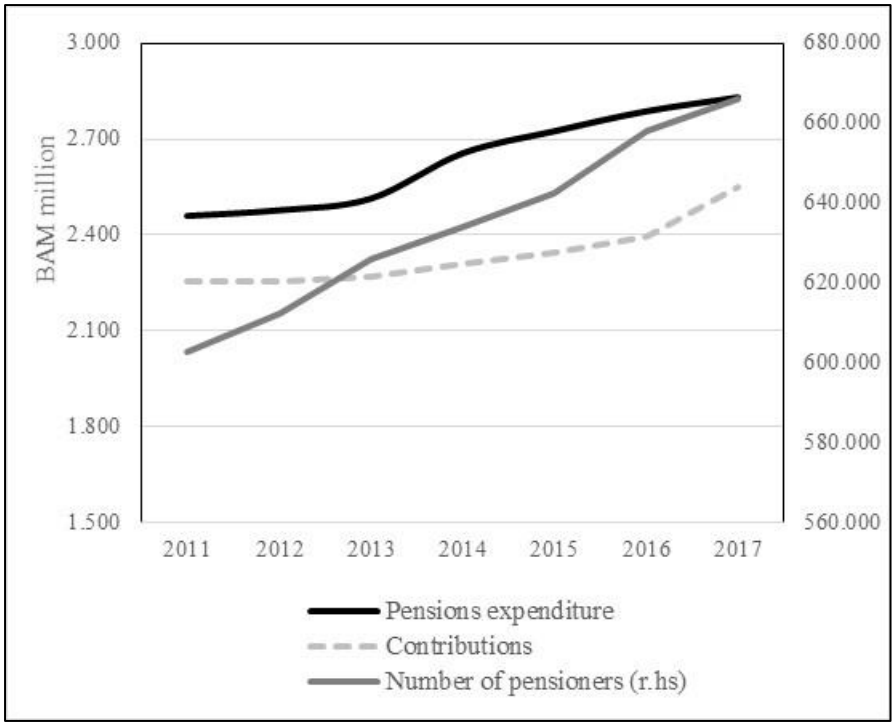
Graph 10. Yearly growth rate of average pensions and inflation



Source: BHAS, FIPDI, RS PIDF, own calculations.

It is evident from Graph 11 that pension income (+ 13.2% in 2017 compared to 2011) shows a slight increase in relation to pension payments (+ 15.2%), which is affected by the faster growth in the number of pensioners than employees, and a faster increase in the value of pension paid than gross salary.

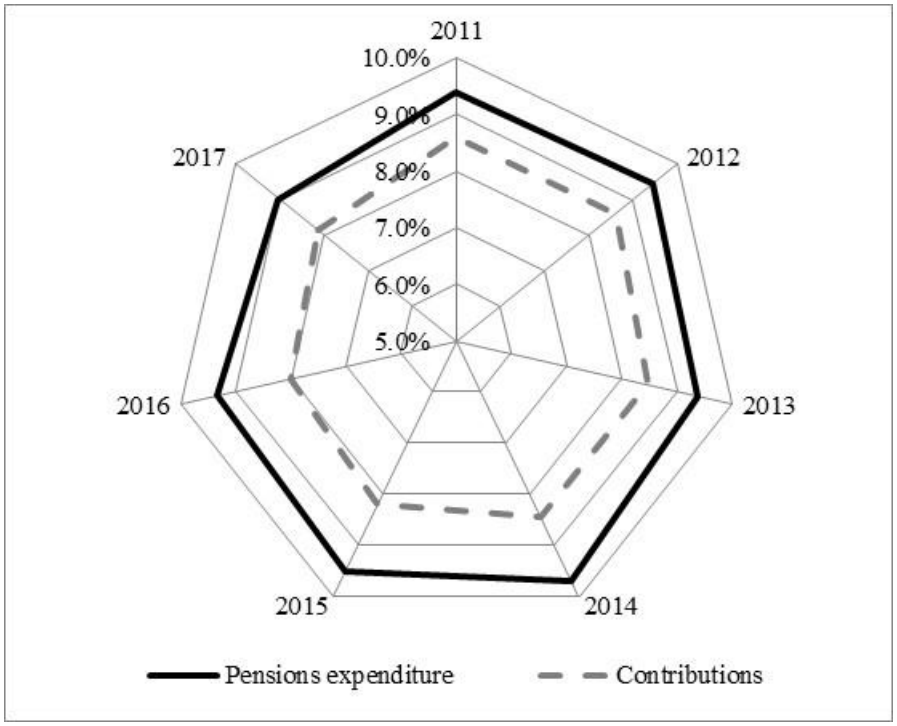
Graph 11. Pension spending and projected contributions in BH



Source: FIPDI, RS PIDF, BHAS, own calculations.

Looking at the movement of retirement pensions and estimated contributions measured as the share of GDP (Graph 12), it is obvious that there is a relatively constant gap between the items. Likewise, knowing that most public institutions and publicly owned companies have problems with settling their obligations, it is clear that funds have to come up with other means of fundraising. As a result, pension funds borrow capital from commercial banks and sell out their assets to pay off their obligations by trying to secure short-term stability, which can be difficult to achieve without a stronger employment and better control of business entities that still compensate employees through informal payments.

Graph 12. Projected contributions and pension expenditure, as % of GDP



Source: FIPDI, RS PIDF, BHAS, own calculations.

Box 2. Balanced conditions of pay as you go public system fund

A pension system based solely on the intergenerational solidarity in times of great technological advancements, depopulation, and extension of life expectancy is unsustainable, creating a large imbalance between revenue and expenditure of funds, and resulting in a budget deficit. Bearing in mind that the coverage ratio of pensioners and employees is almost equal (1.17 at the end of 2017), and that average pensions are significantly higher than average paid contributions for pensions from gross wages (23% in the FBH, 40% in the RS), the hypothesis states the importance of establishing the balance of the pension system as soon as possible.

For the need of analyzing the system's equilibrium presented in an analysis of the Portuguese public system (Coelho, 2013) the assumption of a one-time model is used where the insurant income represents employee contributions without the inclusion of other revenues, such as transfers from the budget. In this context, income from the insured persons (QC_t) defined as:

$$QC_t = (k_q + k_c) * S_t \quad (1)$$

where S_t represents the gross salary earned at the moment t, while k_q and k_c represent the fraction of the gross salary paid by employees and employers. The total system revenue at the moment t (R_t), with the involved system employees (n_t) is expressed by the extension of the equation as follows:

$$R_t = n_t * (k_q + k_c) * \mathrm{S_t} \quad (2)$$

The expenditure of the system at the moment t with the retirement pension (P_t) of a representative pensioner is shown by this formula:

$$P_t = \emptyset * \mathrm{S_t} \quad (3)$$

where $\emptyset$ represents the replacement rate between the salary of the representative employee and the expenditure for the retirement pension. The total expenditure of the system at the moment t, (D_t) for all retirees (m_t) is defined as:

$$D_t = m_t * \emptyset * \mathrm{S_t} \quad (4)$$

Therefore, in order to establish the balance of the system, the following condition has to be satisfied, where the contribution income is equal to the pension expenditure:

$$R_t = D_t \quad (5)$$

Assuming that the total population (L) reflects the sum of employees (n_t) and pensioners (m_t), and by expanding the stated system equilibrium, the following equation is true:

$$n_t * (k_q + k_c) * \mathrm{S_t} = m_t * \emptyset * \mathrm{S_t} \quad (6)$$

This results in a replacement salary rate with a retirement that is reflected by using:

$$\emptyset = \frac{n_t}{m_t}(k_q + k_c) \quad (7)$$

Furthermore, with a given replacement rate ($\emptyset$), employee contributions (k_q), contributions from the employer (k_c), and the number of pensioners (m_t), the system would be balanced if the number of employees is equal:

$$n_t = \frac{\emptyset}{(k_q + k_c)} m_t \quad (8)$$

In this context, the system will be unbalanced if n_t is greater than the right side of the equation, or if $R_t > D_t$, or if there is a surplus in the system. In addition, the system will be unbalanced if n_t is smaller than the right side of the equation, or if $R_t < D_t$, or if the system is in a deficit. In accordance with the stationary condition of the above equation, the balance between the insured persons and pensioners at different rates of contribution and the replacement rate is shown in the table below (Table 7).

Table 7. Balanced relationship between the number of pensioners and employees

Contribution rate	Replacement rate									
	29%	**28%**	**27%**	**26%**	**25%**	**24%**	**23%**	**22%**	**21%**	**20%**
25.0%	1.16	1.12	1.08	1.04	1.00	0.96	0.92	0.88	0.84	0.80
24.0%	1.21	1.17	1.13	1.08	1.04	1.00	0.96	0.92	0.88	0.83
23.0%	1.26	1.22	1.17	1.13	1.09	1.04	1.00	0.96	0.91	0.87
22.0%	1.32	1.27	1.23	1.18	1.14	1.09	1.05	1.00	0.95	0.91
21.0%	1.38	1.33	1.29	1.24	1.19	1.14	1.10	1.05	1.00	0.95
20.0%	1.45	1.40	1.35	1.30	1.25	1.20	1.15	1.10	1.05	1.00
19.0%	1.53	1.47	1.42	1.37	1.32	1.26	1.21	1.16	1.11	1.05
18.5%	1.57	1.51	1.46	1.41	1.35	1.30	1.24	1.19	1.14	1.08
18.0%	1.61	1.56	1.50	1.44	1.39	1.33	1.28	1.22	1.17	1.11
17.0%	1.71	1.65	1.59	1.53	1.47	1.41	1.35	1.29	1.24	1.18
16.0%	1.81	1.75	1.69	1.63	1.56	1.50	1.44	1.38	1.31	1.25
15.0%	1.93	1.87	1.80	1.73	1.67	1.60	1.53	1.47	1.40	1.33

Source: FIPDI, RS PIDF, BHAS.

The table indicates the equilibrium position for the selected replacement and contribution rates, including the stationarity of employees and pensioners. According to this, it is evident that lower contribution rates require a better coverage ratio, that is, a higher number of employees in relation to the number of pensioners. The data presented coverage ratios for the FBH and the RS, but in the case of the RS, all insured persons are taken into account, while the given ratio is considerably worse if we take into account only the employees. As previously stated, the contribution rates in the entities are different, 23% in the FBH and 18.5% in the RS. So, in case the contribution rate in FBH is reduced by 1%, which is a frequent proposal from the real sector, given the high operating costs, it is necessary to increase the coverage ratio to 1.27. Likewise, any increase in contributions in the case of the RS reduces the current imbalance, assuming stationarity, but it is clear that only 2% lower replacement rate yields a coverage ratio of 1.08, which almost equalizes the number of employees and retirees, and therefore creates greater imbalance.

For the purposes of estimating the intertemporal equilibrium conditions of a pay as you go (PAYGO) system with defined benefits, let us consider the assumption of a model with N periods, where the insured persons are also representative of employees and employers, and where recipients of compensation are representative pensioners. In addition, the system revenues exclusively depend on the contributions, while the potential system surplus accumulates with the corresponding annual interest rate (i). Accordingly, the budgetary constraint of the PAYGO system with defined benefits in terms of expenditure and income in each period depends on the movement of employees and pensioners. In order to explain the relationship, which implies two periods, equations 2 and 4 are replaced with:

$$R_2 + R_1(1+i) = D_2 + D_1(1+i) \quad (9)$$

According to which:

$$\emptyset m_2 s_2 + (1+i)\emptyset m_1 s_1 = (k_q + k_c) n_2 s_2 + (1+i)(k_q + k_c) n_1 s_1 \quad (10)$$

Bearing in mind that the universe of pensioners (employees) grows at constant rates of β (α), the equivalence between the rate of employees and pensioners' equals:

$$\emptyset\left[(1+\beta)\mathrm{m}_1 S_2 + (1+i) m_1 S_1\right] = (k_q + k_c)[(1+\alpha) n_1 S_2 + (1+i) n_1 S_1] \quad (11)$$

With assumption $S_1 = S_2$, the equilibrium of the system is shown by the following equation:

$$\emptyset m_1 S_1\left[(1+\beta) + (1+i)\right] = (k_q + k_c) n_1 S_1[(1+\alpha) + (1+i)] \quad (12)$$

According to which,

$$n_1 = \frac{\emptyset[(1+\beta)+(1+i)]}{(k_q+k_c)[(1+\alpha)+(1+i)]}\mathrm{m}_1 \quad (13)$$

In the same context as for the model with a single period, the system will be unbalanced if n_t is greater than the right side of the equation or, in other words, there is a surplus in the system, while the reverse case represents system's deficit. In order to illustrate the equilibrium of the system in Table 8, a coverage ratio is presented, including different scenarios for increasing the number of employees and retirees. The calculation includes the aforementioned replacement rates, and rates of contributions that differ by entities, which requires the separation of results into different tables. According to the FBH rates, it is evident that the minimum number of employees per pensioner ranges from the lowest ratio of 1.17, which implies an increase in employees by 5% and a reduction in the number of pensioners by 5%, to a maximum ratio of 1.29, which implies an increase in the number of pensioners by 5%, and a reduction in the number of employees at the same rate. The table itself indicates, for example, that the 2% growth rate of employees annually and 5% growth rate of pensioners per year require that the number of employees per pensioner initially is 1.24. According to this, it is obvious how the growth rate of pensioners greater than the growth rate of employees affects the balance of the system.

Table 8. Intertemporal balance at the initial moment, FBH

		Growth rate of pensioners										
		-5%	**-4%**	**-3%**	**-2%**	**-1%**	**0%**	**1%**	**2%**	**3%**	**4%**	**5%**
Growth rate of employees	**-5%**	1.23	1.23	1.24	1.24	1.25	1.26	1.26	1.27	1.28	1.28	1.29
	-4%	1.22	1.23	1.23	1.24	1.24	1.25	1.26	1.26	1.27	1.28	1.28
	-3%	1.21	1.22	1.23	1.23	1.24	1.24	1.25	1.26	1.26	1.27	1.28
	-2%	1.21	1.21	1.22	1.23	1.23	1.24	1.24	1.25	1.26	1.26	1.27
	-1%	1.20	1.21	1.21	1.22	1.23	1.23	1.24	1.24	1.25	1.26	1.26
	0%	1.20	1.20	1.21	1.21	1.22	1.23	1.23	1.24	1.24	1.25	1.26
	1%	1.19	1.20	1.20	1.21	1.21	1.22	1.23	1.23	1.24	1.24	1.25
	2%	1.18	1.19	1.20	1.20	1.21	1.21	1.22	1.23	1.23	1.24	1.24
	3%	1.18	1.18	1.19	1.20	1.20	1.21	1.21	1.22	1.23	1.23	1.24
	4%	1.17	1.18	1.18	1.19	1.20	1.20	1.21	1.21	1.22	1.23	1.23
	5%	1.17	1.17	1.18	1.18	1.19	1.20	1.20	1.21	1.21	1.22	1.23

Source: FZ MIO/PIO, FZS.

Regarding the data from the RS (Table 9), which imply a different rate of contribution and replacement rate, it is evident that the ratios are lower compared to the FBH data, bearing in mind that the RS data include all insured persons, therefore voluntary contributors, as well as insured persons from the BD.

Table 9. Intertemporal balance at the initial moment, RS

		Growth rate of pensioners										
		-5%	**-4%**	**-3%**	**-2%**	**-1%**	**0%**	**1%**	**2%**	**3%**	**4%**	**5%**
Growth rate of employees	**-5%**	1.17	1.17	1.18	1.19	1.19	1.20	1.20	1.21	1.22	1.22	1.23
	-4%	1.16	1.17	1.17	1.18	1.19	1.19	1.20	1.20	1.21	1.22	1.22
	-3%	1.16	1.16	1.17	1.17	1.18	1.19	1.19	1.20	1.20	1.21	1.21
	-2%	1.15	1.16	1.16	1.17	1.17	1.18	1.19	1.19	1.20	1.20	1.21
	-1%	1.14	1.15	1.16	1.16	1.17	1.17	1.18	1.19	1.19	1.20	1.20
	0%	1.14	1.14	1.15	1.16	1.16	1.17	1.17	1.18	1.19	1.19	1.20
	1%	1.13	1.14	1.14	1.15	1.16	1.16	1.17	1.17	1.18	1.18	1.19
	2%	1.13	1.13	1.14	1.14	1.15	1.16	1.16	1.17	1.17	1.18	1.18
	3%	1.12	1.13	1.13	1.14	1.14	1.15	1.16	1.16	1.17	1.17	1.18
	4%	1.12	1.12	1.13	1.13	1.14	1.14	1.15	1.16	1.16	1.17	1.17
	5%	1.11	1.12	1.12	1.13	1.13	1.14	1.14	1.15	1.16	1.16	1.17

Source: Fond PIO RS, RZS

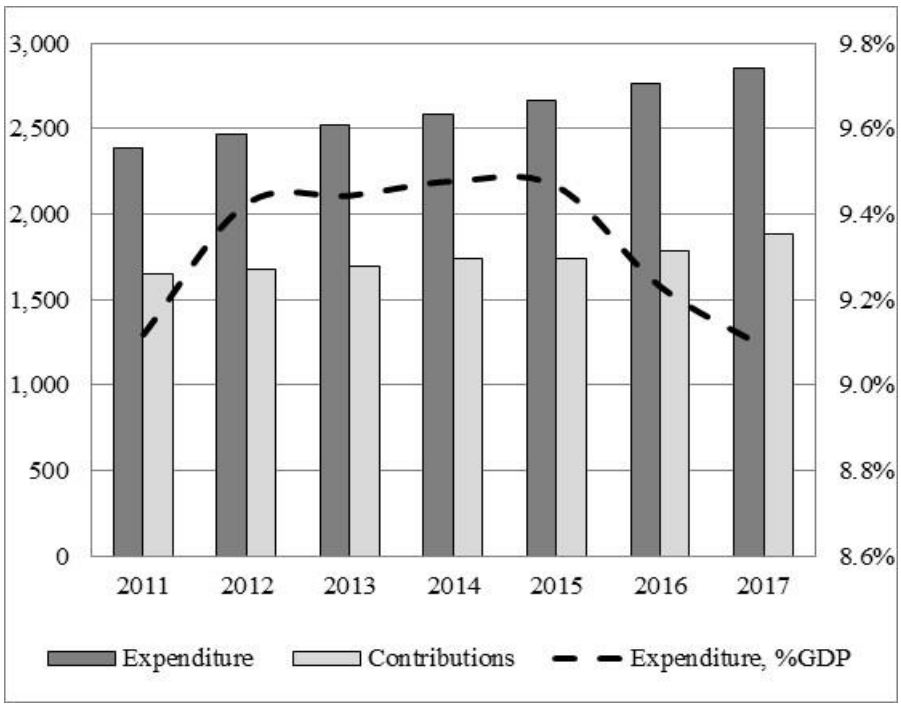
3.3.2. Health and long-term care in BH

Unlike the pension system that is organized at the entity level, the health care system functions at cantonal, the BD and entity levels. Decentralization of the system poses a major problem for the health sector, especially as the contribution rates at the cantonal level differ, and the contribution revenues vary considerably. Likewise, charging different premiums and health insurance fees also creates a social gap between different areas. Insufficient compliance with the health care regulations and controls requires users, who are already charged for health care services, to seek assistance in the private sector, which further burdens the economic standard of the population. For this reason, the public health sector loses high quality workforce, which

finds better working conditions in the private sector. In addition, the high demand for health care professionals in more developed countries because of the aging of the population, has an impact on increasing emigration of medical personnel. Estimate of the overall health spending in BH, made by the World Health Organization (WHO) and BHAS, indicates a marked reduction in public spending, which accounts for 70% of total consumption, while the private health care sector spending is growing to 30% of total spending.

As is the case with the pension funds' calculations, the health care budget is influenced by the faster growth in total expenditures than the collected contributions (Graph 13). By comparing the contribution payments at the end of 2017 with those from 2011, it is obvious that they recorded a growth of 14.5%, while total expenditures, which include the spending consumption of mandatory and non-compulsory insurance, increased by 19.5% over the same period. It should also be borne in mind that these health sector expenditures do not include data from a significant number of registered private sector entities, particularly in the FBH, although they have the same legal obligation to keep records and report just like the public sector. The deficit is funded partly by the state aid and other revenues, which include personal participation of insured persons, donations, and direct payments of legal and natural persons. As for the revenues generated by compulsory insurance, the highest share of total revenues is contributory income, which was on average 88.5%, according to the available data.

Graph 13. Health care trends in BH

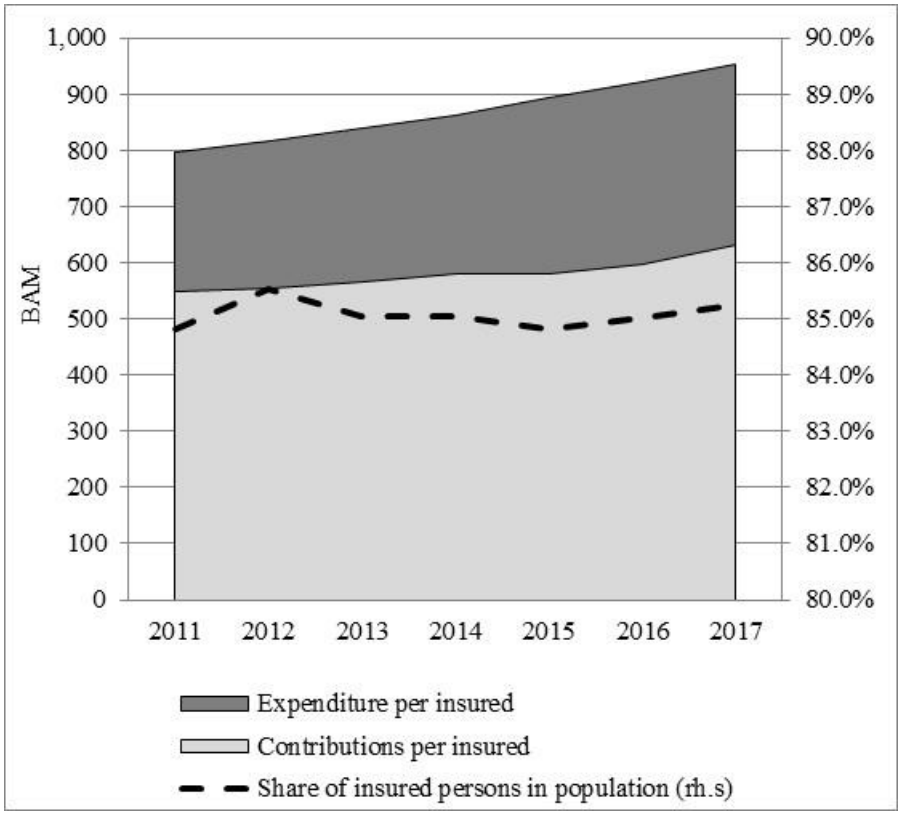


Source: BHAS, FZO FBH, FZO RS. Note: The FBH data for 2017 is based on the available historical information.

Issues of the health sector are reflected in the disproportion between the insured persons and the level of income by insurance categories, according to which, in the FBH case, the share of insured employees with an employer is 38.3% of the total insured persons in the health sector, while their revenues account for 94.9% of total income from contributions. On the other hand, the share of insured retirees is 32.1% in the total insured persons, while the same category has a share of 1.6% in the contribution income. Furthermore, unemployed insured persons covered by insurance and other categories of insured persons have a share of 29.6% in the total number of insured persons, while the revenues of the above-mentioned categories account for 3.6% of total income from contributions. According to the above, it is visible how much the burden of financing in the health sector is borne by the employees, so it is clear that the justified private sector desires to reduce the contribution rate, thereby increasing the competitiveness of the domestic economy, are not economically realistic given the current financial position of the funds.

Looking at the indicators on the movement of revenues from contributions and expenditures by the total number of insured persons (Graph 14), at the end of 2017, the estimate of the contribution income amounts to BAM 630.8 per insured person, while the annual expense per insured person amounted to BAM 953.5. Total number of the insured persons in the observed period did not show significant deviation, since there were about 3 million insured persons per every observed year. The stated ratio at the end of 2017 is 85.2%. With inclusion of the population migration data, a smaller number of inhabitants is expected, indicating that this ratio is underestimated.

Graph 14. Contributions and expenditure per number of insurants



Source: BHAS, FZO FBH, FZO RS. Note: The FBH data for 2017 is based on the available historical information.

3.3.3. Education system in BH

The education system in BH is characterized by a high degree of decentralization, insufficient investment in technological and personnel progress, and unavailable statistics on the sector. When comparing the availability of data on the education system between the EU and BH, there is a noticeable difference, especially with regard to the budget spending of this sector. Bearing in mind that education in BH is organized at lower levels of government and that the authorities at higher levels of government have not established a clear strategy for timely and transparent reporting, it becomes clear that the public is deprived of the information from the education sector. While most developing countries make education reforms one of the key national interests that should bring a complete turnaround in the system in place and stimulate innovation and creativity of future generations, educational system in BH is still scattered between different interpretations of political and historical facts.

According to the statistical report on the number of students and employees in the sector (Table 10), the number of students has been decreasing over the years, while the number of teachers is slightly increasing. When we compare the last available data from the school year 2017/2018 with the school year 2011/2012, there is a noticeable drop in the number of students by 12.7%,

which is mostly influenced by a decrease in the number of elementary, secondary and tertiary students, while the number of teachers is significantly higher. Evident drop in these categories can also be attributed to the demographic changes, reflected in low fertility and population emigration. It is to be noted that among the mentioned levels of education, only the figures in pre-school education are increasing due to the increased number of pre-school institutions providing pre-school education, and due to the fact that parents are working or have higher education.

Table 10. Structure of education system

School	Pre-school		Primary		Secondary		Tertiary		Total	Total
year	*Students*	*Teachers*	*Students*	*Teachers*	*Students*	*Teachers*	*Students*	*Teachers*	students	teachers
2011/2012	17,293	2,513	316,657	24,605	163,284	12,773	107,083	9,224	604,317	49,115
2012/2013	18,817	2,622	304,881	24,227	166,662	13,043	116,567	9,144	606,927	49,036
2013/2014	19,880	2,759	302,133	24,467	156,350	13,037	113,290	9,462	591,653	49,725
2014/2015	21,490	3,024	296,819	24,062	143,881	12,774	109,259	9,581	571,449	49,441
2015/2016	22,901	3,255	291,342	23,515	133,228	12,859	105,299	9,526	552,770	49,155
2016/2017	24,918	3,490	287,729	23,824	126,824	12,652	100,333	10,028	539,804	49,994
2017/2018	25,844	3,659	282,614	23,969	124,368	12,615	94,827	10,150	527,653	50,393

Source: BHAS.

By comparing the student to teacher ratio according to the different levels of education with the average ratios for EU-21 member states, the most significant differences are found in pre-school education, where the ratio at the EU-21 level in 2012 was 13, while in BH, that same indicator is seven. As far as the other education level are concerned, ratios in the EU-21 for primary, secondary and higher education are 15, 13 and 14, respectively. At the same time, in BH, the same ratios were 13, 13 and 12, respectively. The aforementioned student and teacher ratios can serve to create an adequate plan and rationalize costs.

By only comparing the number of teachers in the education system with the total number of employees in BH, at the end of 2017, their share was 6.4%. If the number of teachers is added to the official data on other employees in the education system (total activity: 65,917 persons), it may be concluded that the total share of those employed in education is 8.3%. In order to estimate the projected budget spending in education, the relevant information on expenditure in this sector is the data on gross fixed consumption and compensation of employees. According to these categories of expenditure and income approaches of calculating GDP, the budget spending in education amounted to 4.3% of total GDP at the end of 2016. According to the data presented in the EU education system, total costs at the EU level amounted to 4.5% at

the end of 2016, with a note that the cost of salary and compensation accounts for 61.8% of the total cost of the education system.

According to the 2018 World Economic Forum report "The Future of Jobs ", the technological change over the next five years will lead to the abolition of 75 million jobs, whose processes will be automated. At the same time, a necessary change in the existing skills of employees is expected in the mentioned period, suggesting that on average, 42% of current jobs will have to adapt to technological changes. In order to foster economic growth, especially in BH, where investment in the research and development stands at 0.2 percentage points of GDP, compared to the 2% of GDP in the EU, the new educational strategy is crucial in times of continues technological progress and digitalization.

3.3.4. Unemployment benefits in BH

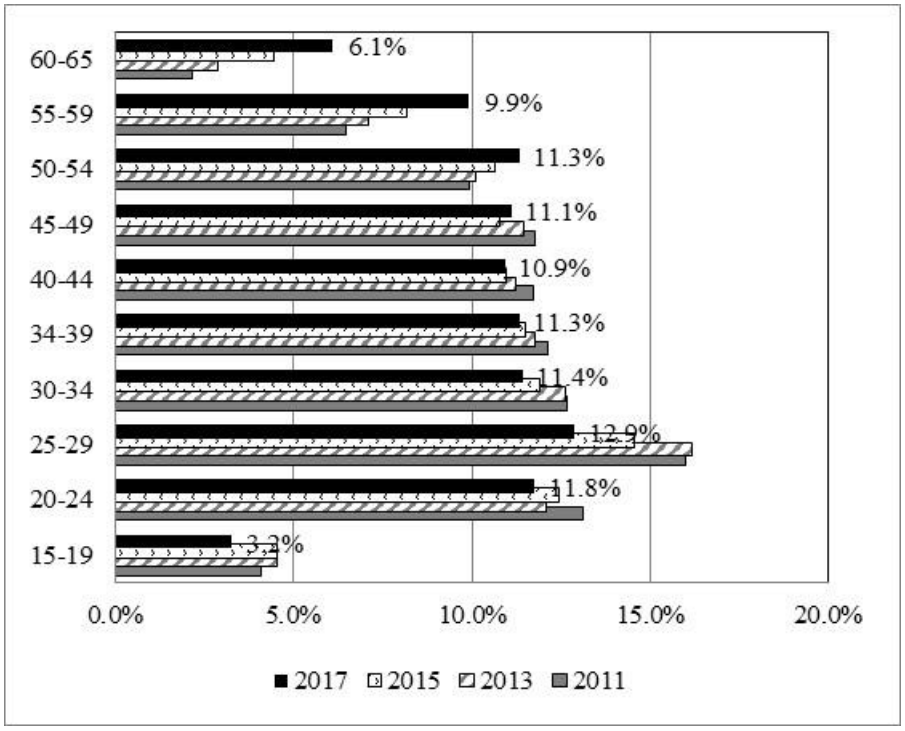
Employment agencies at cantonal and entity governance levels, designed to improve the quality of labor supply on the market through various programs, are under the same pressure as other social funds. The labor market is characterized by low productivity and high share of informal economy, which are one of the key problems of funds whose revenues depend solely on the contribution of the insured persons. Inadequate supply of quality jobs, high public sector share in the economy, and obsolescence in the education system, which directly affect the inadequate attractiveness for foreign investment, mostly mark low labor productivity. Furthermore, weakened supervision enhances the informal economy, whose share in BH economy is 29.9%[3] according to the latest projection, and this creates a large gap between legal entities performing activities in accordance with the regulations, and individuals who, by failure to register their employees and report the realized turnover, have a significant impact on the competitiveness of the market.

According to the structure of the registered jobseekers' distribution across age groups (Graph 15), it is evident that a substantial number of young people are unemployed, which confirms the theory of significant demographic changes, most often reflected through lower birth rates and higher rates of emigration for young people. Bearing in mind that by the end of 2017, 39.3% of the unemployed belonged to the age group up to 35, it is clear that young people,

[3] Leandro Medina and Friedrich Schneider (2017), "Shadow Economies Around the World: What Did We Learn Over the Last 20 Years?" IMF Working Papers 18/17.

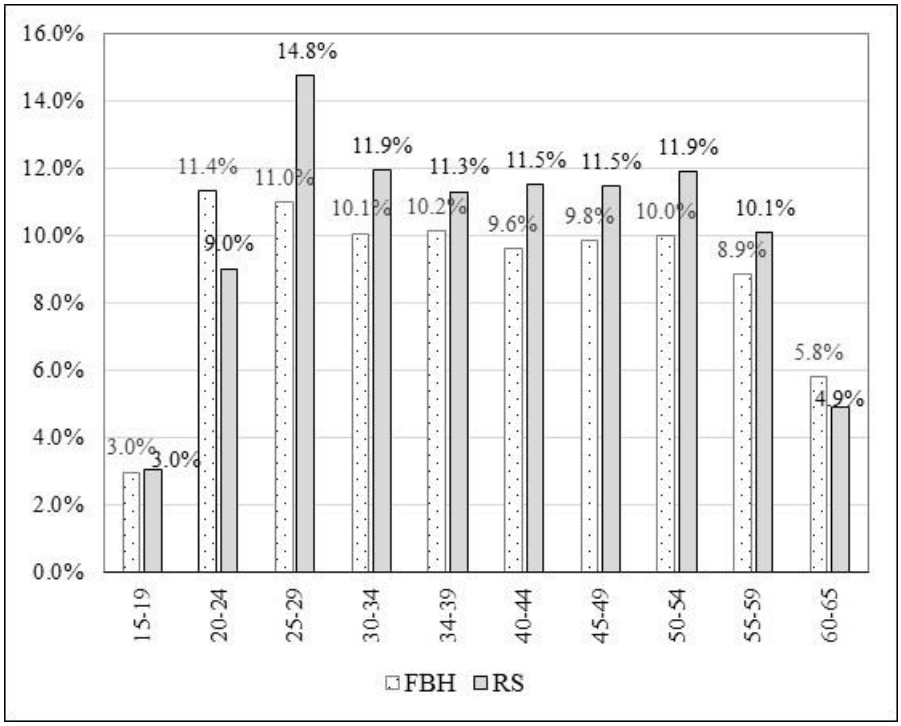
many of whom have no work experience after many years of education, do not have much choice in securing their own existence, and thus seize the opportunity in the more developed countries. In addition, deterioration of indicators for people older than 50 over the years' points to the fact that employers are prioritizing technological advances prior to their work experience. As for unemployment in entities (Graph 16), there is slight variation, especially in case of the youngest and the oldest age groups. The presented data can be used for budget planning, which is particularly interesting for unemployment over the age of 55 (74,406 persons), suggesting upcoming pressures on pension funds, depending whether female or male threshold for the retirement period is considered.

Graph 15. Unemployment age structure



Source: FZZZ, ZZRS.

Graph 16. Unemployment age structure by entities in 2017



Source: FZZZ, ZZRS.

In accordance with the employment agencies law, unemployed persons who at the time of employment have at least eight months of work or eight months with interruptions in the last 18 months, are entitled to unemployment benefit, with the payment of 40% of the average net salary paid in the last three months before the end of the employment contract. Depending on the time spent at work, the financial compensation can be paid for a period of three to 24 months. At the end of 2017, only 2.9% of total unemployed persons received financial allowance, while at the end of 2011, the same share was 2.0%. According to these figures, it is obvious that most of the registered unemployed persons have been registered for an extended period of time with the employment service in order to be entitled to health insurance. The latest available data for 2014 indicates that the total employment expenditure of the Employment Service amounted to 0.85% of GDP, which is below the EU average. However, long-term EU projections foresee a reduction in spending, while in the case of BH, increased spending on employment funds is expected due to the need for significant investments to boost employment.

4. Recommendations and future challenges in BH

Experience of the EU member countries in implementing the necessary reforms of pension and social funds must serve as a guide to improve the economic and social situation in BH. The

presented facts on the state of individual funds indicate the extent of need for prompt changes and the crucial role of time. Any further delay in the reform will undermine the already faltered pension and social protection funds. Additionally, a thorough reform of the education sector is necessary in order to enable future generations to respond to the complex labor market. Public administration has a crucial role to play in strengthening the needs of the real sector by creating a quality human resources pool that will increase the benefit of companies. It is obvious nowadays that there is a trend among young unemployed persons to seek existential security only in the public sector.

The challenges faced by pension funds should not be observed only through the regularity of pension payments and the provision of financial resources, but require a more extensive analysis of the current and future funding problems. Dealing with the reform of the funds by proposing the inclusion of private funds in economically unjustified periods points to the fact that copying laws and policies from other systems does not necessarily yield the same results. It is therefore essential to create a realistic and economically justified legal framework that will increase the security and profitability of pension funds. Extension of the retirement threshold, equalization of women and men, sanctioning of early retirement, and encouraging of continued work after the prescribed threshold are becoming necessary steps to stabilize the pension system. Previously anticipated fund liabilities and the prolonged life expectancy of the population do not leave much time, nor does the social sensitivity of individual issues. In addition, continual monitoring of the contribution payment represents an inevitable step in securing short-term liquidity. However, in order to respond to the increasing costs, it is essential to ensure a stable legal and political framework, bearing in mind the present and future age structure of the population, which will attract foreign and domestic investors and thus increase employment. Current reforms on the labor markets, resulting from the Reform agenda for BH, influenced the growth of employment and wages that has a positive impact on the increase in the payments of contributions, so it is crucial to continue with implantation of this plan in order to improve the funds' operations.

At times when the functioning of the health care system does not instill confidence in the population and when medical professionals emigrate to more developed countries, the reform of this sector is an elementary requirement. Moreover, hard work reflected through the lack of elementary working material and insufficient infrastructure additionally burdens insurance beneficiaries and increases the daily share of the private sector in the overall health care sector. Changing the policy that will stop further disturbances of the public sector will greatly increase

the confidence of the insured persons. Likewise, retaining high quality staff with a direct effect of increasing the work performance has an indirect impact on the reduction of emigration, not only of the medical professionals, but also of other categories in the society that lost confidence in the health care sector.

Along with the listed funding challenges, the key systemic problems are the high share of informal economy, inadequate tax discipline and inadequate contribution payments. Although these problems are always placed at the forefront when announcing the goals of economic policy makers, the activity of the working-age population is not sufficiently compensating for the increase in operating costs of the funds. Reducing the share of the informal economy, with the single premise of a fair and transparent control, would increase the economic activity and improve the funding of funds. Otherwise, business operations, marked by high fiscal and parafiscal charges[4], would further reduce competitiveness if contribution taxes increase or get introduced as new; therefore, it is essential to facilitate business through the inclusion of the informal economy, thereby reducing unfair competition on the market. In addition, most public companies have to restructure and privatize their assets in order to stop further deterioration of capital and assets, which ultimately can have a positive impact on the employment and funding of the funds. Domestic economy is highly dependent on the inflow of personal remittances[5], which are mainly used for consumption rather than for productive investment, so it is important to develop a new financial literacy program for the diaspora, prepared by the Ministry for Human Rights and Refugees and World Bank in order to mobilize investment potential of the diaspora.

According to the data in the analysis, there are some deviations from the statistical reports, where data at different governance levels has not been harmonized. Furthermore, omission of individual categories of insurance ultimately disrupts transparency and reliability of statistics. Highly decentralized system should not be the reason for the mismatch in statistical reports, but should present a challenge and opportunity for more detailed statistical reporting, which will serve as the basis for more detailed and better analysis.

[4] According to the Reform Agenda Action plan, the register of non-taxable payments is published by Public Administration Reform Coordinator's Office, and it states that there are 3,000 non-taxable receivables at all levels in BH.

[5] 8.1% of GDP on an average in the last decade.

5. *Conclusion*

The necessary reforms of pension and social funds must recognize these challenges by assessing demographic indicators. Significant demographic changes, especially in recent years, have to be in the focus when creating economic and social strategy, in order to stop further distortions of fund operations. The presented and interpreted findings base on the model of balanced conditions of a public system with defined benefit are consistent with the expected results regarding the influence demographic changes and ageing population have on the operations of the funds. The dependence ratio of those economically active in inactive population becomes one of the key indicators on which developed countries build their own strategy, so it is essential to begin providing the minimum conditions for the publication of reliable statistical data that will serve to create a long-term economic and social strategy.

Further emigration can be prevented by creation of new jobs, and by building confidence in the social protection, health and education sectors. Encouraging birth increases through various allowances is a necessary step in reduction of emigration, especially in times when the population's standard of living stagnates. Furthermore, ensuring a quality health and education sector will enable future generations' development and improvement, thus increasing the competitiveness of the economy. Aging of the population will inevitably have a major impact on the operations of all funds, in particular health and pensions funds, so it is necessary to create a more business friendly environment that will increase the salaries and allowances of employees in addition to the raise in economic activity and thus the payment of contributions. Reducing public sector can have a negative short-term impact on the fund budgets, but in the long run, it increases market competitiveness and reduces overall budget spending. Likewise, the analysis has pointed to many disadvantages of decentralization among all sectors, so any elimination or merge of individual bodies and levels of government can have a positive impact on reducing the budget spending. Funds released from the administration may be used for quality employment programs, increasing social benefits, and prevention of further natural decline of population.

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