# Affecting the Sustainability of Public Finances by the Social Measures Adopted in Romania between 2006 and 2017

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## Abstract

*Sustainability has become one of the most used terms in public finance assessment. This article treats the issue of sustainability of public finance in terms of social measures adopted in Romania during 2006-2017. In other words, indicators for public finance sustainability will not be calculated in this article, but will be measured the impact of population aging, expenditures with all social and health protection measures on total public debt and government debt. This study has started from the idea that public finance sustainability is, essentially, the ability of a government to sustain the long-term expenditures without increasing public debt. According to the results obtained from the econometric calculations, the increase of the public debt in Romania in the last 12 years is explained in the ratio of 9% by the increase in pension expenditures and 16.8% by the increase of the social security expenditures. In this case, more coherent fiscal, social and economic policy measures are needed in Romania.*

**Key words:** Sustainability, Public Finance, Fiscal Policy, Public Pensions, Social Security
**J.E.L. classification:** H51, H53, H55

## 1. Introduction

First of all, it is necessary to clarify the concept of sustainability of public finance or sustainable public finance. In the literature, we come across several definitions of the concept of sustainability of public finance, but all refer to the same thing: the ability of a government to sustain long-term current expenditure, fiscal policy and other policies without endangering the government's solvency or without paying government or forecasted expenditures (European Commission, 2017).

Sustainability of public finance or the issue of debt or fiscal sustainability is multilateral and there is no agreed definition of what is a sustainable debt position. Blanchard et al. (1990) considers that, in essence, it refers to the direction towards which the government's actions are directed, in other words, whether the current policies adopted by the government will lead to an excessive accumulation of debts.

The time horizon in which debt sustainability is analyzed depends on its purpose. In some cases, it could be a relatively short horizon and the aim is to assess in the short and medium term the debt dynamics (for example, in the European Commission's assessments of the update of stability and convergence programs for the purpose of budgetary surveillance) or analysis of the debt service dynamics, including in many cases external debt service (e.g. IMF default risk assessment). Short and medium term, sustainability assessment depends on factors such as the debt structure by maturity, currency denomination and average terms of new commitments. In the case of assessing the long-term sustainability of public finance, the time horizon should be considerably longer to assess the budgetary impact of governmental commitments, notably in terms of pensions. Against such a significant budgetary challenge of population aging, the latter has been a concern for the EU in recent years and is the focus of several research and reports (European Commission, 2006, 2009, 2017).

Fiscal sustainability is crucial and has become more evident in the context of the recent global downturn. However, the sustainability of public finance is not a circumstantial concern; it essentially affects intergenerational fairness and sets useful principles at all times and to all governments, regardless of their current levers. Maintaining public debt under control and maintain the capacity to issue debt when necessary, is essential for the proper functioning of the economy.

Moreover, Obstfeld M. (2013) and Eyraud L. and Wu T. (2015) have shown that the limited capacity to obtain tax revenues in the economy, the motives of the political economy that complicates consolidation, and the evidence that structural reforms are implemented more successfully in countries with healthy initial fiscal positions are reasons for adopting cautiousness policies.

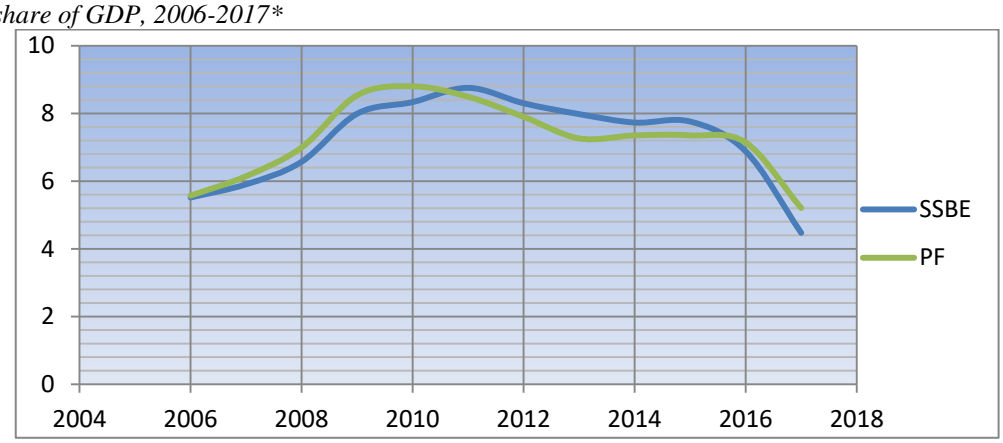
## 2. Sustainability of public finance in terms of aging population in Romania

It is obvious that imminent demographic changes - driven by the aging of the population - will be a major challenge for the development of public finance and social security systems. Population aging in Romania and other EU Member States will have a significant impact on economic growth and will generate significant pressures for increasing public expenditures. In order to assess the extent of this challenge, the evaluation of the long-term sustainability of public finance is part of the EU's ordinary budgetary surveillance, based on projections of long-term public spending and budgetary strategies presented in the Stability and Convergence Programs. In this context, the correctness of short- and medium-term budgetary objectives and long-term sustainability are at the heart of the European Commission's analysis.

Romania's population will age in the coming decades, and life expectancy will grow happily compared to previous generations; however, at the same time, the labor force will shrink. Public finance need to be prepared for this development.

To highlight the impact of the aging population on the sustainability of public finance, I will present in this section the evolution of the pension fund as a share of GDP in Romania during 2006-2017 (September 2017), compared to the evolution of expenditures registered in the social security budget in the same period, with a view to highlighting the periods during which the pension fund exceeded the social security budget expenditure and how much (as a share of GDP).

*Figure no. 1. Evolution of social security budget expenditures (SSBE) and pension fund (PF) in Romania as share of GDP, 2006-2017**




*Source*: Own processing of data available on https://www.cnpp.ro/statistici and http://www.mfinante.ro
*) Data available until September 30, 2017

As shown in figure no. 1, between 2006 and 2017 (September), spending on state pensions exceeded social security budget expenditures in 2006 (by 187 million lei, representing 0.05% of GDP), 2007 (by 935 million lei, representing 0, 24% of GDP), 2008 (by 2164 million lei, representing 0.42% of GDP), 2009 (by 2744 million lei, representing 0.54% of GDP), 2010 (by 2391 million lei, of GDP), 2016 (by 1959 million lei, representing 0.26% of GDP), and the largest increase was recorded in 2017, with 6042 million lei (0.72% of GDP).

All of these extra amounts were covered by the state budget, affecting other public activities and policies. Only in 2011-2015 there were no additional amounts compared to those registered in the public social security budget.

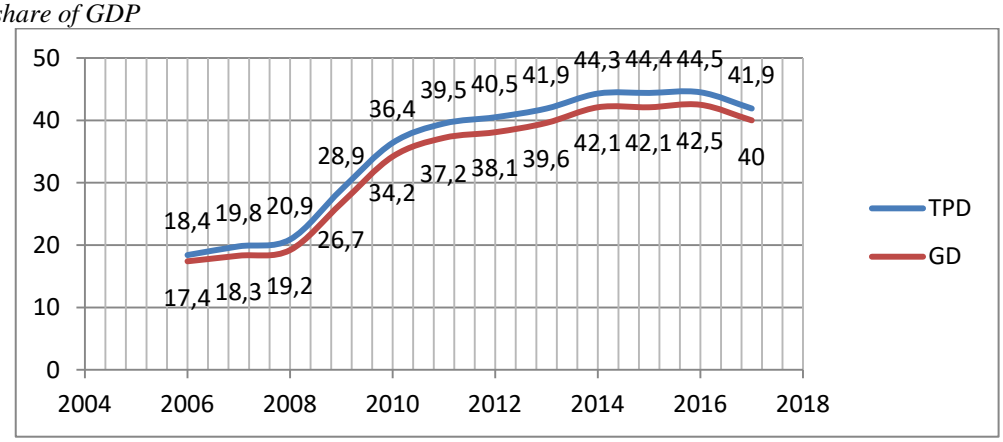
In order to highlight the impact of population aging coupled with the decrease of the labor force employed in the economy and the reduction of the young population on the sustainability of public finance, we used an econometric study with a linear regression equation of the form:

$$Y = \alpha + \beta * X$$

Where: Y - is the dependent variable; X - is an independent variable; α, β – are the regression equation parameters.

In this case, we considered the total public debt and government debt as dependent variables reflecting the sustainability of public finance, and as an independent variable, the state pension expenditures in Romania during 2006-2017. These two equations have to show the influence of pension expenditure on public debt in Romania.

*Figure no. 2. Evolution of total public debt (TPD) and government debt (GD) in Romania (2006-2017*) as share of GDP*




*Source*: Own processing of data available on http://www.bnr.ro
*) Data available until September 30, 2017

Romania's public debt, both total and government, as it can be seen in the figure above, has exceeded 40% of GDP since 2012. The maximum was reached in 2014 (44.3%), 2015 (44.4%) and 2016 (44.5%). For 2017, data are partial and public debt is 41.9% of GDP in September, and government debt is 40%.

The two equations considered are:

$$\boldsymbol{TPD = \alpha + \beta * PF}$$
$$\boldsymbol{GD = \alpha + \beta * PF}$$

Where:
TPD – is total public debt
GD – is government debt
} are the dependent variables
PF – is pension fund, independent variable
α,β – are the regression equation parameters

*Table no. 1. Correlation Matrix*

| | TPD | GD | PF |
|---|---|---|---|
| TPD | 1.000000 | 0.999673 | 0.300248 |
| GD | 0.999673 | 1.000000 | 0.279879 |
| PF | 0.300248 | 0.279879 | 1.000000 |

*Source*: Own processing of data with EViews

As it can be seen from the correlation matrix (in Table no. 1) there is a positive relationship between the independent variable – State Pension Expenditure (PF) and the dependent variables – Government Debt (GD) and total public debt (TPD).

Following econometric calculations, were obtained the results:

*Table no. 2 The regression equation between government debt (GD) and state pensions (PF)*

| Dependent Variable: GD<br>Method: Least Squares | | Sample: 2006 2017<br>GD=C(1)+C(2)*PF | | |
|---|---|---|---|---|
| | Coefficient | Std. Error | t-Statistic | Prob. |
| C(1) | 15.53289 | 19.29023 | 0.805221 | 0.4394 |
| C(2) | 2.432460 | 2.638530 | 0.921900 | 0.3783 |
| R-squared | 0.078332 | Mean dependent var | | 33.11667 |
| Adjusted R-squared | -0.013834 | S.D. dependent var | | 9.922136 |
| S.E. of regression | 9.990533 | Akaike info criterion | | 7.592165 |
| Sum squared resid | 998.1076 | Schwarz criterion | | 7.672983 |
| Log likelihood | -43.55299 | Durbin-Watson stat | | 0.102570 |

*Source*: Own processing of data available on http://www.bnr.ro and https://www.cnpp.ro/statistici

Using the least squares method in EViews, the following regression equation was obtained:

$$\boldsymbol{GD = 15,53 + 2,43 * PF}$$

According to this equation to a change in state pension spending by 1% of GDP, government debt will change in the same direction as 2.43 percent as a share of GDP. The coefficient of determination for regression (R-squared) signifies the fact that 7.8% of the variation in the government debt is explained by the modification of the pension fund.

*Table no. 3 The regression equation between total public debt (TPD) and State Pension (PF)*

| Dependent Variable: TPD<br>Method: Least Squares | | Sample: 2006 2017<br>TPD=C(1)+C(2)*PF | | |
|---|---|---|---|---|
| | Coefficient | Std. Error | t-Statistic | Prob. |
| C(1) | 15.63368 | 19.79563 | 0.789754 | 0.4480 |
| C(2) | 2.695188 | 2.707659 | 0.995394 | 0.3430 |
| R-squared | 0.090149 | Mean dependent var | | 35.11667 |
| Adjusted R-squared | -0.000836 | S.D. dependent var | | 10.24800 |
| S.E. of regression | 10.25228 | Akaike info criterion | | 7.643890 |
| Sum squared resid | 1051.093 | Schwarz criterion | | 7.724708 |
| Log likelihood | -43.86334 | Durbin-Watson stat | | 0.100932 |

*Source*: Own processing of data available on http://www.bnr.ro and https://www.cnpp.ro/statistici

Using the least squares method in the EViews program, the following regression equation was obtained:

$$\boldsymbol{TPD = 15,63 + 2,7 * PF}$$

According to this equation, at a change in state pension spending by 1% of GDP, total public debt will change in the same direction with 2.7 percent as a share of GDP. The coefficient of determination for regression (R-squared) shows us that 9% of the variation in the total public debt is explained by the modification of the pension fund.

## 3. Sustainability of public finance in terms of social measures adopted in Romania between 2006 and 2017

The sustainability of public finance or of tax system can also be addressed in the light of all the social protection measures adopted. From this point of view, the study continues to measure the influence of all social protection costs, not just those with retirement pensions, on government debt and total public debt.

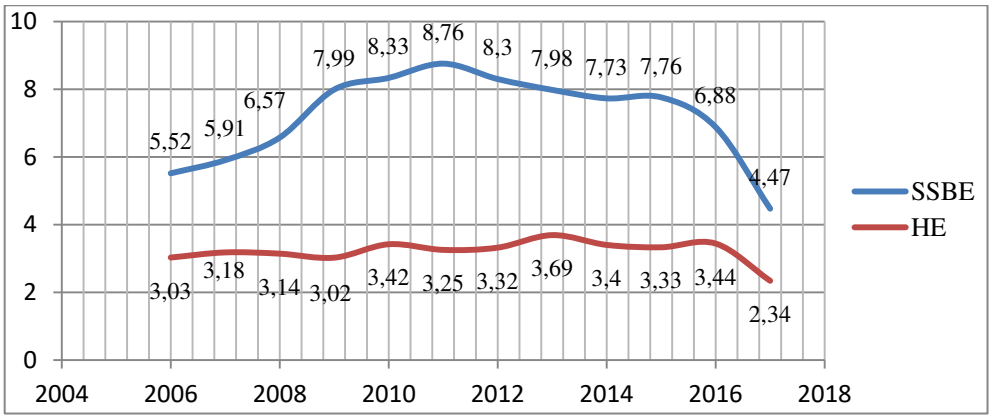
In this respect, using the regression technique and a multiple linear equation, the impact of social security and health expenditures, as independent variables, on government debt and total public debt was calculated. The equations used take the following form:

$$\boldsymbol{TPD = \alpha + \beta * SSBE + \gamma * HE}$$

$$\boldsymbol{GD = \alpha + \beta * SSBE + \gamma * HE}$$

Where:
TPD – is total public debt } are dependent variables
GD – is government debt }
SSBE – is social security budget expenditures } are independent variables
HE – represents health expenditures }
α,β, γ – parametrii ecuației de regresie

*Figure no. 3. Evolution of social security budget expenditures (SSBE) and health expenditures (HE) in Romania (2006-2017*) as share of GDP*




*Source*: Own processing of data available on http://www.mfinante.ro
*) Data available until September 30, 2017

The evolution of social security budget expenditures experienced an upward trend between 2006 and 2011 (see figure 3) from 5.52% to 8.76% as a share of GDP. After 2011, the trend was downward, reaching 4.47% of GDP in 2017, but this year's data is partial.

Regarding the health expenditures, they exceeded by around 3% of GDP over the whole period, except in 2013 when they reached 3.69% of GDP. The smallest value is still in 2017 and is due to partial data - until September 2017.

Following econometric calculations, were obtained the results:

*Table no. 4 The regression equation between government debt (GD) and Social Security Budget Expenditures (SSBE) and Health Expenditures (HE)*

| Dependent Variable: GD<br>Method: Least Squares | | Sample: 2006 2017<br>GD=C(1)+C(2)*SSBE+C(3)*HE | | |
|---|---|---|---|---|
| | Coefficient | Std. Error | t-Statistic | Prob. |
| C(1) | 17.80400 | 30.29614 | 0.587666 | 0.5712 |
| C(2) | 3.409952 | 3.348029 | 1.018495 | 0.3350 |
| C(3) | -2.856534 | 13.27042 | -0.215256 | 0.8344 |
| R-squared | 0.152193 | Mean dependent var | | 33.11667 |
| Adjusted R-squared | -0.036209 | S.D. dependent var | | 9.922136 |
| S.E. of regression | 10.10017 | Akaike info criterion | | 7.675300 |
| Sum squared resid | 918.1215 | Schwarz criterion | | 7.796527 |
| Log likelihood | -43.05180 | Durbin-Watson stat | | 0.121549 |

*Source*: Own processing of data available on http://www.mfinante.ro and www.bnr.ro

Using the least squares method in the EViews program, the following regression equation was obtained:

$$GD = 17.80 + 3.41 * SSBE - 2.86 * HE$$

According to this equation, a change of state social insurance budget expenditure to 1% of GDP, government debt will change in the same direction by 3.41 percent to GDP. With the same 1% change in health spending, as a share of GDP, government debt will change in the opposite direction to 2.86% of GDP.

The coefficient of determination for regression (R-squared) shows us that 15.21% of the variation in the government debt is explained by the modification of the social security budget expenditures (SSBE) and health expenditures (HE).

*Table no. 5 The regression equation between total public debt (TPD) and Social Security Budget Expenditures (SSBE) and Health Expenditures (HE)*

| Dependent Variable: TPD<br>Method: Least Squares | | Sample: 2006 2017<br>TPD=C(1)+C(2)*SSBE+C(3)*HE | | |
|---|---|---|---|---|
| | Coefficient | Std. Error | t-Statistic | Prob. |
| C(1) | 18.92324 | 30.99926 | 0.610442 | 0.5567 |
| C(2) | 3.729741 | 3.425731 | 1.088743 | 0.3046 |
| C(3) | -3.297203 | 13.57841 | -0.242827 | 0.8136 |
| R-squared | 0.167935 | Mean dependent var | | 35.11667 |
| Adjusted R-squared | -0.016968 | S.D. dependent var | | 10.24800 |
| S.E. of regression | 10.33458 | Akaike info criterion | | 7.721186 |
| Sum squared resid | 961.2321 | Schwarz criterion | | 7.842413 |
| Log likelihood | -43.32712 | Durbin-Watson stat | | 0.120499 |

*Source*: Own processing of data available on http://www.mfinante.ro and www.bnr.ro

Using the least squares method in the EViews program, the following regression equation was obtained:

$$\boldsymbol{TPD = 18.92 + 3.73 * SSBE - 3.3 * HE}$$

According to this equation, at a change in the state social security budget expenditure by 1% of GDP, the total public debt will change in the same direction as 3.73 percent as a share of GDP. With the same 1% change in health spending, as a share of GDP, total public debt will reverse by 3.3% of GDP.

The coefficient of determination for regression (R-squared) shows us that 16.8% of the variation in the total public debt is explained by the modification of the social security budget expenditures (SSBE) and health expenditures (HE).

## 4. Conclusions and limitations

It is clear from the econometric analysis that an increase in pension expenditure leads to an increase of both government debt (by 2.43% of GDP) and total government debt (by 2.7% of GDP). From this point of view, we can say that the sustainability of public finance in Romania is affected by the aging of the population, but a healthier fiscal policy capable of bringing more revenues to budget from the economy and adopting measures to reduce the unemployment rate, otherwise said the increase in the number of taxpayers, would be viable measures, which would no longer affect the public finance.

It also follows from the analysis that an increase in the social security budget would also lead to an increase of both government debt (by 3.41% of GDP) and total public debt (by 3.73% of GDP). Because all social protection measures in Romania were considered in this analysis, the discussion could be more complicated. On the one hand, this includes both pension expenditure and other expenditure to support disadvantaged social categories. From this point of view, I believe that it is necessary to adopt more firm measures for the integration of these categories into the social and economic life of the country.

Health expenditures do not affect the sustainability of public finance, but on the contrary, they are inversely proportional in size due to the fact that the health system in Romania is underfunded, and yet there are still no coherent measures in this direction.

For a better clarification of the situation, it is necessary to carry out this study on all the chapters of the social security budget expenditures. Also, in order to see the sustainability of public finance in Romania, it is necessary to calculate its indicators - the S1 indicator, which measures the change in the primary structural balance for the next year, which is necessary to achieve a debt level in 2050 of 60% of GDP and the S2 indicator, which measures the size of a permanent budget adjustment that meets government's inter-temporal budget constraints on an infinite horizon.

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