

INVESTIGATING THE GAP OF PUBLIC DEBT SUSTAINABILITY IN EMU MEMBER STATES

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Abstract: The issues of assuring public debt sustainability and the impact of tax and budgetary policies on it were the subject of numerous studies both at national and international level, with complex approaches in the specific literature. Debt sustainability is al so important because of the need to ensure long term sustainability of public finances in the context of risk factors represented by rising longevity, falling fertility rates and the retirement of the baby boom generation (European Commission, 2006). In this context we find important to investigate the sustainable gap of public debt over 1990-2005 and the public indebtedness path over 2050 in EMU member states.

Key words: public debt, fiscal balance, primary balance, sustainability.

Introduction

The issues of assuring public debt sustainability and the impact of tax and budgetary policies on it were the subject of numerous studies both at national and international level, with complex approaches in the specific literature. They start with defining the sustainability and its the factors of influence, continue with identifying the type of sustainability and ending with the determination of the impact of public policies on the sustainability and the impact of sustainability on other macroeconomic variables (e.g. economic growth, inflation).

Debt sustainability is al so important because of the need to ensure long term sustainability of public finances in the context of risk factors represented by rising longevity, falling fertility rates and the retirement of the baby boom generation. These risks were identify by the European Commission (2006) based on the projections until 2050 taking into the consideration the incidence of population ageing on economic growth and public expenditure in order to avoid an excessive burden on future generations.

The purpose of this paper is to analyze the gap sustainability in EMU member states. This paper is structured as follows. Starting with empirical evidence on public debt sustainability in section 2 and sustainability model in section 3, section 4 presents the gap of public debt sustainability and risk factors (rising longevity, falling fertility rates and the retirement of the baby boom generation) effects on public debt path. Section V discusses the conclusions of our study.

2. Empirical evidence on public debt sustainability

In the studies that focused on the analysis of public debt, sustainability at country level there were used different methods (Blanchard, 1990; Buiters, 1995; Bohn, 1998, 2005), which lead sometimes to contradictory results. Thus, in the case of US economy, tests on the stationarity of deficit and public debt allowed to identify the existence of public debt sustainability, although data series differed among the studies, as follows: Hamilton and Flavin (1986), annual data series for 1962-1984; Trehan and Walsh (1988, 1991), annual data series for 1890-1983, 1960-1984; Kremers (1988), annual data series for 1920-1985; Bohn (2005), annual data series for 1792-2003. Wilcox (1989) used annual data series for 1960-1984 and stationarity tests on the public debt of USA. He concluded that there is a lack of sustainability, result confirmed Hakkio and Rush (1991), who used quarterly data series or the period 1950-1988 and cointegration tests between the budgetary revenues and expenses. These cointegration tests between the budgetary revenues and expenses of the USA were used for testing the sustainability in the works that

followed. This time, the result was positive, although the data series were both annual and quarterly: annual for 1950-1989 in Tanner and Liu (1994) (except the year of 1982); quarterly for 1947-1992 in Quintos (1995) (sustainability until 1980); quarterly for 1950-1990 in Haug (1995); quarterly for 1950-1994 in Crowder (1997) (sustainability until 1982); quarterly for 1947-1992 in Cunado, Gil-Alana and Perez de Gracia (2003), who observed that public debt had a weak sustainability which meant that the adjusting processes are long lasting.

The studies developed on other countries had led to different results: (i) public debt is sustainable in Australia (Elliot and Kearney, 1988); Greece (Visaggio, 2004); Germany (Payne, 1997; Greiner, Koeller and Semmler, 2005); France (Monnier and Tinel, 2006); Japan (Doi, Ithori and Mitsui, 2006); (ii) public debt is not sustainable in Canada (Smith and Zin, 1991); India (Buitner and Patel, 1992); Greece (Makrydakis, Tzavalis and Balfoussias, 1999), Italy (Baglioni and Cherubini, 1993; Athanasios and Sidiropoulos, 1999; Galli and Padovano, 2005); Brazil (Issler and Lima, 1998; Giambiagi and Ronci, 2004; de Mello, 2005).

The determinants of the budgetary deficit and public debt were the subject of many papers meant to explain how the public policies can explain them. Analyzing the OCDE countries Tujula and Wolswijk (2004) have identified a series of factors, as the macroeconomic environment, interest rates, electoral cycles, integration in the Economic and Monetary Union. Some works are in favor of the importance of public debt management (maturity, instruments etc) in stabilizing of public debt to GDP ratio (Bacchiocchi si Missale, 2005).

The studies on the relation between the fiscal sustainability and the external sustainability show a strong correlation between the budgetary and current account deficits that lead to the concept of twin deficits. (Enders,1990; Raybaudi, Sola and Spagnolo, 2003; Ley, 2005).

The recent studies analyze the issues of assuring public debt sustainability through tax and budgetary policies on emergent economies. They use simulations for medium term projections of the impact of excess debt. Gupta, Baldacci, Clements and Tiongson (2003) study on 25 emergent economies the factors that influence the fiscal adjustment periods quantified by the variation of the ratio of fiscal deficits to GDP. Thus, based on the variables used (number of periods when the fiscal consolidation failed; the ratio of budgetary expenses to GDP; the ratio of budgetary revenues to GDP; the initial level of debt to GDP ratio; the exchange rate; the unemployment rate; corruption etc) they draw up a model of fiscal consolidation that emphasizes the importance of both budgetary deficits and public debt. They obtained results that concluded that the risk of fiscal adjustment decreases as the economy heads to a sustainable level of public debt (link between the dimension of fiscal adjustment and sustainability).

Through their study, Hostland and Karam (2005) show that tax and budgetary policies can prevent the excessive debt on medium term of the emergent economies only if they are flexible. Therefore, the governments of emergent economies have to make a trade-off between the management of the risks induced by the unsustainable debt and other fiscal and budgetary goals. These findings were confirmed also by Celasun, Debrun and Ostry (2006), Jeanne and Guscina (2006). Celasun, Debrun and Ostry (2006) demonstrate the role of tax and budgetary policies, and of the noise that they induce in economy on the risk of unsustainable public debt using the example of Argentina, Brazil, Mexic, South Africa and Turkey. Jeanne and Guscina (2006), analyzing the determinants of public debt sustainability on 19 emergent economies conclude that the sustainability of public debt can be assured by a mix of fiscal-budgetary policies, that have goals like reducing the budgetary deficit and increasing the primary surplus, and the monetary policy, that aims at monetary stability. Michel, von Thadden and Vidal (2006) give an answer to the question of the possibility of establishing the sustainable public debt level as a rule in drawing up all the instruments of tax and budgetary policies. They use a model of a closed economy with several generations and conclude that the answer to the above question depends on the long-term level of public debt at which the economy is stable

In Romania, the interest for the study of public debt sustainability and incidence of tax and budgetary policies has grown as these are among the objectives of the governmental policies needed to fulfill the five criteria for convergence to the European Union. Such studies were performed by Albu and Pelinescu (1999, 2002), Campeanu, (2007, 2006, 2005, 2003, 2002), Stoian (2007, 2006, 2005, 2004), Mosteanu, Catarama and Campeanu (2005), Obreja and Brasoveanu, (2005), Roman and Marin (2005).

3. Public debt sustainability according to the intertemporal budget constraint

Public debt sustainability is investigated especially by using intertemporal budget constraint which implies that public debt at the moment t (b_t) depends on primary deficit at the moment t (pd_t) and public debt at the moment $t-1$ (b_{t-1}). Equation 1 indicates the budget constraint presented in many studies such as Blanchard (1990), Buiters (1995), Bohn (1998,2005):

$$b_t = pd_t + \frac{1+r}{1+g} \cdot b_{t-1} \quad (1)$$

where: b_t is public debt to GDP ratio at the moment t ; pd_t is primary deficit at the moment t ; r is real interest rate of public debt; g = real growth rate.

Considering the expectations at moment t on equation (1), sustainability is achieved when present discounted value of public debt converges to zero, as follow:

$$\lim_{k \rightarrow \infty} E_t \left(\frac{1+r}{1+g} \right)^{-(1+k)} b_{t+k+1} = 0 \quad (2)$$

The variables used in the model are in real terms and as GDP ratio, but real interest rate of public debt and real growth rate are considered constant in order to simplify the equation.

4. Public debt sustainability in European Monetary Union member states

The aim of our study is to investigate the public debt sustainability level using the equation 1 in order to see if fiscal policy is or nor on a sustainable path. The results of our study are presented in table 1, when we evidence the sustainability gap according to fiscal criteria established by Maastricht Treaty and to intertemporal budget constraint, and the effects of risk factors (European Commission, 2006) on public debt.

| | Public debt according to limit imposed by Maastricht Treaty | | Sustainable public debt according to intertemporal budget constraint | | Effects of risk factors on public debt |
|----------|-------------------------------------------------------------|------------------------|----------------------------------------------------------------------|---------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| | below 60% of GDP | above 60% of GDP | indebtedness below the sustainable level | indebtedness above the sustainable level | |
| EMU | 1990-1994 (gda 51.1%) | 1995-2005 (gda 76.2%) | 1998-2002 (sga - 2.6 p.p.) | 1992-1997 (sga 4.1 p.p.), 2003-2005 (sga 2 p.p.), | Positive effect on public debt during 2010-2030, when gda will be 47.04%, except 2050, when indebtedness will reach 126.9%. |
| Belgium | | 1990-2005 (gda 118.5%) | 1990-2005 (sga - 9.9.p.p.) | | Public indebtedness will decrease over 2010-2030 (gda 62%), so we may consider that these factors will have no effect on public debt |
| Finland | 1990-2005 (gda 44.7%) | | 1996-2005 (sga - 6.5p.p.) | 1990-1995 (sga 8.5p.p.) | Positive effect on public debt which will be 18% in 2010, and -39.5%, on average, during 2030-2050 |
| Slovenia | 1990-2005 | | 1994 (sg - | 1995 (sg 2.1.p.p.), | Major effects because |

| | | | | | |
|-------------|----------------------------------------------|-----------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| | (gda 24.9 %) | | 1.7p.p.),1996 (sg - 1.2p.p.), 1998 (sg -0.2p.p.), 2005 (sg -0.9p.p.) | 1997 (sg 1.1 p.p.), 1999-2004 (sga 1.7p.p.) | the public debt will increase from 67% in 2030 to 274% in 2050 |
| Austria | 1990-1992 (gda 56%) | 1993-2005 (gda 65%) | 1991-1992 (sga - 2.3.p.p.), 1996-1998 (sga -3.8p.p.) , 2000-2005 (sga - 3.3.p.p.) | 1993-1995 (sga 3.5p.p.), 1999 (sg 0.6p.p.) | Public debt will decrease over 2010-2030 from 63.4 in 2005 to 42% in 2030. But in the next two decades there will be a return to 63%. |
| Netherlands | 2000-2005 (gda 52.5%) | 1990-1999 (gda 74%) | 1991-1994 (sga - 5.1p.p.), 1996-2002 (sga - 6.8p.p.), 2004-2005 (sga -1.5 p.p.) | 1995 (sg 3.1p.p.), 2003 (sg 1.3p.p.) | Positive effect because the public indebtedness will be, on average, 31% over 2010-2050 |
| Luxembourg | 1990-2005 (gda 6.2%) | | 1991 (sg -2 p.p.), 1993-2003 (sga - 3.1 p.p.) | 1992 (sg 0.5 p.p.), 2004-2005 (sga 0.9) | A major negative impact because public debt will increase from 10% in 2010 to 268% in 2050 |
| Italy | | 1990-2005 (gda 112 %) | 1992-2004 (sga - 6.5 p.p.) | 2005 (sg 0.9 p.p.) | There will be an influence on public debt which will be 261% in 2050, from 110% in 2010 |
| France | 1990-2002 (gda 51.2 %) | 2003-2005 (gda 64.5%) | 1991 (sg -1.2p.p.), 1998-2001 (sga - 2.2 p.p.) | 1992-1997 (sga 3.5 p.p.), 2002-2005 (sga 2.7 p.p.) | Yes, public debt will increase with 258.9%, in 2050 from 2005 |
| Spain | 1990-1993 (gda 48.3%), 2001-2005 (gda 49.4%) | 1994-2000 (gda 64.1%) | 1991-1992 (sga - 0.03p.p.), 1997-2005 (sga -3.5 p.p.) | 1993-1996 (sga 4.3p.p.) | Public debt will decrease in 2010-2030 (dga 4.5%), except 2050, when public indebtedness will reach 72% |
| Greece | | 1990-2005 (gda 104.4%) | 1994-1999 (sga - 7.3 p.p.), 2001-2002 (sga -0.9 p.p.) | 1992-1993 (sga 8.5 p.p.), 2000 (sg 8.9 p.p.), 2003-2005 (sga 4.2 p.p.) | Yes, public debt will increase with 137.2% in 2050 from 2005 |
| Ireland | 1998-2005 (gda 37.1%) | 1990-1997 (gda 85.8%) | 1991-2005 (sga - 6.4 p.p.) | | Positive influence (gda 7.7%) |
| Germany | 1990-1996 (gda 49.4%) , 2001 (gda | 1997-2000 (gda 60.8%) 2002- | 1996-2002 (sga - 2.4 p.p.) | 1992-1995 (sga 4.2 p.p.) , 2003-2005 (sga 1.9 p.p.) | Influence the public debt path which will increase during 2010-2050 (gda 152.7%) |

| | | | | | |
|---------|-----------------------------|---------------------------------|------------------------------------------------------|--------------------|---------------------------------------------------------------------------|
| | 59.6%) | 2005 gda 64.5% | | | |
| Denmark | 1999-2005 (gda 46.8%) | 1990- 1998 (gda 69.4%) | 1992 (sg -4.4 p.p.), 1994-2005 (sga -8.2 p.p.) | 1993 (sg 4.1 p.p.) | Positive influence because public debt will decrease (gda - 84%) |

Source: data presented in this table are determined by authors, as percentage of GDP, using official data from EUROSTAT for 1990-2005 and projected debt developments for 2010, 2030 and 2050 (European Commission, 2006).

Note: gda is gross public debt average expressed as percentage of GDP; sg is sustainability gap that expresses the difference between gross public debt and sustainable public debt; sga is sustainability gap average.

Table 1 Sustainability gap and effects of risk factors on public debt

Investigating the results of our research we may identify the period of sustainable public debt in EMU member states and the effect on risk factors on public debt. The findings are presented in the next section.

5. Conclusions

The risk factors (rising longevity, falling fertility rates and the retirement of the baby boom generation) identified by European Commission (2006) express the need to realize policy adjustments in order to ensure long term sustainability of public finances. In this context, we consider important to investigate the debt sustainability and the sustainability gap in EMU member states taking into the consideration the Maastricht Treaty limit for public debt and the intertemporal budget constraint. We use these techniques because of the short series data which not allows us to run econometric tests.

As results of our researches we find: (i) evidences on sustainability using Maastricht Treaty criteria and intertemporal budget constraint in: EMU, 1990-1991; Finland, 1996-2005; Slovenia, 1994, 1996, 1998, 2005; Austria, 1990-1992; Netherlands, 2000-2002, 2004-2005; Luxembourg, 1991, 1993-2003; France, 1991-2001; Spain, 1991-1992, 2001-2005; Ireland, 1998-2005; Germany, 1996, 2001; Denmark, 1999-2005; (ii) positive influences of risk factors on public debt path in Belgium, Finland, Netherlands, Spain, Ireland, Denmark; (iii) major influence of risk factors on public debt in Slovenia, Luxembourg, Italy, France, Greece, Germany.

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