

## Sustainable public finance – illusion or reality? Evidence from old EU member states

Tomasz Uryszek  
*University of Lodz*  
*Poland*  
*e-mail: tomasz.uryzbek@uni.lodz.pl*

**Abstract.** The main goal of the article is to investigate the level of sustainability of public finance in short and long run in the old EU member states. It is accompanied by the following hypotheses: (1) the old EU economies are able to generate primary fiscal surpluses and in this way they can aim to achieve sustainability of their public finances, (2) the last financial crisis and high costs of debt service were the obstacles in aiming at the sustainability of public finance. The research method is based on the primary fiscal balances and debt service costs. The research period covers the years 1996-2015. Data were taken from Eurostat and the European Commission's Directorate General for Economic and Financial Affairs. The outcomes of the research prove the hypotheses were correct.

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### INTRODUCTION

The concept of public finance sustainability is connected to the value and structure of budget expenditure and revenue as well as the volume of fiscal deficit and debt. The size and structure of public expenditures result from the scope of state responsibilities (Kosikowski, 2005, p. 107). The tasks of the public sector determine the demand for financial resources (Kleer, 2005, p. 129). Budget revenue is determined by fiscal capacity. The public authorities face the dilemma whether they should increase budget revenue (by increasing taxes) or should they cut expenditure (Głuchowski, 1995). The third choice is to create deficit financed by public debt. As the volume and structure of public expenditure and revenue are country-specific and closely related to the political doctrine as well as to social and economic policies (Lubińska, Franek, 2005, p. 35), the optimal choice for international comparisons is to focus on the outcome of the different fiscal policies – deficit and debt.

Nowadays, fiscal deficits and public debts are immanent characteristics of almost all free market economies. Financing current consumption with borrowing seems attractive to the governments, but they cannot issue ever increasing debt. Last financial crisis verified the perception of public debt instruments. Investors stopped perceiving them as "no-risk" or "very low risk" papers. Risk premium went up making the cost of

debt service higher. Some countries, including EU member states, have generated excessive volumes of public debt. Under such circumstances meaningful questions arise: can we consider public finances as sustainable or seeking to sustainability? Can indebted public finances be sustainable?

The main goal of the article is to investigate the level of sustainability of public finances in the short and long run in the old EU member states. It is accompanied by the following hypotheses:

- old EU economies are able to generate primary fiscal surpluses and in this way they can aim at sustainability of their public finances,
- recent financial crisis and high costs of debt service were the obstacles in aiming to sustainability of public finance.

The research method is based on the primary fiscal balances and debt service costs. The research period covers the years 1996-2015. Data were taken from Eurostat and the European Commission's Directorate General for Economic and Financial Affairs.

## SUSTAINABILITY OF PUBLIC FINANCE – THEORETICAL BACKGROUND

The idea of sustainability in the area of public finance dates back to the first classical economists, such as Adam Smith, David Hume or David Ricardo (see e.g.: Rowley et al, 2002). They linked sustainable fiscal policy directly with the volume of public debt and then focused on the effects of the debt. They compared the effects of tax and debt financing of public expenditure. Public spendings were mostly assumed to be exogenous at the same time (Neck, Sturm, 2008, p. 2).

Public debt can be an instrument for aggregate demand and national income increase. Assuming that (according to classical economy) the economy achieves its equilibrium when all the resources are used, additional demand will only lead to the rise of the level of prices. On the other hand, if we assume that the economy itself is unable to achieve equilibrium using all the factors of production, and there are some "supplies" of unused resources (according to the Keynesian approach), public debt increase should result in the rise of national income. Additional public expenditure financed by public debt will generate higher level of aggregate demand which will be met by higher level of supply (Gali, 2013, pp. 973-1003). Of course, a question about the optimum or maximum value of the deficit and debt remains.

It is worth mentioning that not only Keynesian approach but the classical economy also brought justification for public debt as an instrument of fiscal policy. According to the *Ricardian equivalence* theorem, public debt (in the sense of its consequences) can be neutral to the economy. Public debt neutrality means here, that "...deficit and tax financing of government budgets are equivalent with respect to capital accumulation" (Neck, Sturm, 2008, p. 2). If so, we could risk saying that indebted public finance can be considered sustainable. The idea of debt neutrality was reviewed and examined by Robert J. Barro (Barro, 1974, p. 1095-1117; Barro, 1989, pp. 37-54). It is based on the concept of the hard public budget constraint and the permanent income theory, incorporated into the modern theory of finance by Milton Friedman in 1957 (Friedman, 1957). In the literature we may find a lot of pros and cons of this theorem. The main problem still remains: there is no clear information on the maximum (or optimum) fiscal deficit or public debt volumes.

Another explanation for public debt financing of government expenditure is connected with the *Ricardian equivalence*. It is based on the idea of intergovernmental redistribution. Intergenerational redistribution in the area of public finance concerns, among others, tax aspects, transfers and debt (Lindbeck, Weibull 1986, pp. 239-267). It is considered in the context of its long-term impact on the economy. The literature review shows that public authorities can (to some extent) be forced to rollover liabilities to future generations (Miles, Cerny, 2001, pp. 549-550; Laffargue, 2009, pp. 79-104), although it may have nega-

tive consequences for the economy (Heller, 2003, pp. 2-3). Long-term “postponement” of debt repayment seems not to follow the idea of sustainable development, according to which the government should take into account the needs of future generations. On the other hand, future generations will benefit from the investments made today, so maybe they should participate in the cost of these investments (assuming that the debt financed investment expenditure rather than current consumption) (cf.: Lindbeck, Weibull, 1986, pp. 239-267). So, to some extent, the idea of sustainable finance depends not only on the level of debt but also on the expenditure financed by borrowing.

According to the literature review, sustainable fiscal policy excludes the possibility situation “...where the government systematically services the cost of existing debt exclusively by issuing new one” (Fan, Arghyrou, 2013, p. 961). Sustainability of public finance is based on generating primary budget surpluses and controlling public debt volume (Gevorkyan, 2010, p. 169). This is necessary to reduce growing debt servicing costs. Nowadays, “...trust in fiscal sustainability is key. Either the markets trust a country or that country is in deep trouble. If trust fades away and interest rates race to the top, there is no space left to encourage growth and employment, nor to finance the tasks of the state to the necessary extent. Thus, sound public finances are a prerequisite for growth and proper functioning of the state” (Steger, 2012, p. 62).

## RESEARCH METHOD AND DATA

The research problem focuses on two macroeconomic variables relevant to sustainability of fiscal policy: deficit and public debt. They both describe the situation of public finance. First, the level of debt and deficit was checked and compared with the maximum levels stated in the Maastricht Treaty. Then, more detailed analyses were conducted. The sustainability problem was considered in the short and long run. The crucial condition for short term sustainability, tested in this article, is that the value of primary fiscal balance should be higher than the cost of public debt service (Neck, Sturm, 2008, p. 7). Such situation allows reducing the public debt volume. This condition can be pictured as follows:

$$PB_t \geq DSC_t \quad (1)$$

where:

$PB_t$  – primary balance in the period t,

$DSC_t$  – cost of public debt service in the period t.

Primary fiscal balance is calculated as the difference between value of public revenue and expenditure reduced by costs of the debt service. It can be written as follows:

$$PB_t = Rev_t - (Ex_t - DSC_t) \quad (2)$$

where:

$Rev_t$  – public revenue in the period t,

$Ex_t$  – public expenditure in the period t,

the rest – as in equation 1.

Primary fiscal surplus causes that the volume of public revenue exceeds the sum of current and investment budget expenditure. The existing surplus is able to cover a part of (or even the whole of) debt servicing costs.

Primary fiscal deficit proves the lack of fiscal balance resulting from the shortage of revenues needed for financing current and investment expenditure. Primary deficit results in the rise of the volume of public borrowing (Uryszek, 2011, pp. 93-102).

For a long term sustainability we assume that the government cannot issue an ever increasing debt. In more general words, the government cannot run Ponzi games (see e.g.: Martins-da-Rocha, Vailakis, 2012, pp. 455-488; Wigger, 2009, pp. 492-499; Minea, Villieu, 2010, pp. 709-711) and must tighten fiscal policy now or in the future. This condition has been already used to assess fiscal sustainability in practice (see e.g.: Qin et al., 2006, pp. 63-84). In this case, the discounted value of primary balances generated over all future periods adjusted for the already existing public debt should be equal to zero. “For fiscal policy to be sustainable, sustainability being defined as the absence of default risk, this condition must be met” (Neck, Sturm, 2008, p. 6). It can be written as follows:

$$\sum_{t=1}^{\infty} \frac{PB_t}{(1+r_t)^t} - PD_0 = 0 \quad (3)$$

where:

$PD_0$  – the current volume of public debt,

$r_t$  – interest rate on public borrowing in the period t, the rest – as in equation 1.

For the purpose of the article, as well as for the empirical analyses, the above mentioned formula was changed a little. The long term sustainability was tested ex post for the period of 20 years between 1996 and 2015. The tested formulas are shown below:

$$\sum_{t=1}^{19} \frac{PB_t}{(1+d_t)^t} \geq 0 \quad (4)$$

$$\sum_{t=1}^{19} \frac{PB_t}{(1+d_t)^t} - PD_{1996} \geq 0 \quad (5)$$

where:

$d_t$  – interest as percent of gross public debt of preceding year (accorded to the excessive deficit procedure, based on ESA 2010),

$PD_{1996}$  – public debt volume in 1996, the rest – as in equation 3.

The length of the research period seems to be suitable, because the average term to public debt maturity in the old EU countries has been rising slowly but did not exceed 10 years (except for Greece, where it was around 15 years). The instruments with the original maturity longer than 15 years represent a few percent of the total public debt (with some exceptions, as Ireland, where their share was around 30%) (Uryszek, 2014, pp. 448-457). Hence, 20-year period is enough to check the sustainability. The interest as percent of gross public debt of preceding year (according to excessive deficit procedure, based on ESA 2010) was used as the discount rate. It seems to be a better solution than taking the long term interest rate, as it better describes the real cost of the debt service. If the outcome of the formula remains zero or higher than zero, the situation can be said to be sustainable during the analysed period. It would be the best, of course, if after adding the

debt volume recorded at the very beginning of the research period, the outcome of the formula still remained positive (or, at least, zero). It seems to be little possible rather unlikely.

To ensure comparability between countries, the data on entire public finance (General Government) sectors based on the European System of Accounts methodology are used. The research period covers yearly observations between 1996 and 2014 as well as the preliminary data for 2015. The data were taken from Eurostat and the European Commission's Directorate General for Economic and Financial Affairs. They are expressed as a percentage of GDP. The "old EU" member state is defined in the article as the country which joined EU structures before 2004 (the so called "Fifteen").

## MAASTRICHT CRITERIA IN OLD EU MEMBER STATES

According to the Maastricht Treaty, fiscal deficit should be lower than 3% of GDP and public debt should not exceed 60% of GDP. In Europe "...fiscal criteria of the Maastricht Treaty (...) are considered major devices to prevent excessive debt increases" (Neck, Sturm, 2008, p. 8). The values of General Government deficit and debt are shown in table 1.

Table 1

General Government deficit and debt in the old UE member states (in % of GDP)

Country	1996		1999		2005		2011		2014		2015*)	
	FB*	PD*	FB	PD	FB	PD	FB	PD	FB	PD	FB	PD
Belgium	-4,0	128,5	-0,6	114,7	-2,6	94,8	-3,9	102,1	-3,2	106,4	-2,6	106,8
Denmark	-2,5	68,0	0,9	56,1	5,0	37,4	-2,1	46,4	1,8	45,0	-2,8	42,7
Germany	-3,4	57,4	-1,5	59,9	-3,3	66,8	-0,9	77,6	0,4	74,2	0,2	71,9
Ireland	-0,3	70,0	2,4	46,7	1,6	26,2	-12,6	111,1	-3,9	110,8	-2,9	110,3
Greece	0,0	0,0	0,0	0,0	0,0	0,0	-10,1	171,3	-2,5	176,3	1,1	170,2
Spain	-5,4	65,6	-1,3	60,9	1,2	42,3	-9,4	69,2	-5,6	98,3	-4,5	101,5
France	-3,9	59,4	-1,6	60,0	-3,2	67,0	-5,1	85,0	-4,3	95,3	-4,1	97,1
Italy	-6,6	116,3	-1,8	109,6	-4,2	101,9	-3,5	116,4	-3,0	131,9	-2,6	133,0
Luxemb.	1,3	7,6	3,5	6,4	0,2	6,3	0,3	18,5	0,5	22,7	-0,4	24,4
Netherl.	-1,7	71,8	0,3	58,5	-0,3	49,4	-4,3	61,3	-2,8	69,5	-2,2	70,5
Austria	-4,4	68,0	-2,6	66,4	-2,5	68,3	-2,6	82,1	-2,9	86,8	-2,0	86,4
Portugal	-4,7	59,5	-3,0	51,0	-6,2	67,4	-7,4	111,1	-4,6	128,9	-3,2	124,5
Finland	-3,2	55,3	1,7	44,1	2,6	40,0	-1,0	48,5	-2,7	58,9	-2,5	61,2
Sweden	-3,1	70,3	0,8	61,5	1,8	48,2	-0,1	36,1	-2,2	41,4	-1,6	41,3
UK	-4,1	47,9	0,8	41,9	-3,5	41,5	-7,6	81,9	-5,5	88,7	-4,6	90,1

\* 2015 – preliminary data; FB – fiscal balance; PD – public debt

Source: own elaboration based on Eurostat and European Commission's Directorate General for Economic and Financial Affairs data

Data analysis proves that Maastricht criteria connected to maximum levels of deficit and debt are mostly not fulfilled. This is particularly evident in the so-called PIIGS countries (Portugal, Italy, Ireland, Greece and Spain) and Belgium which has been struggling with excessive debt volume for years. It is worth mentioning that strong and stable European economies, as Germany, France or Austria also have problem

with Maastricht fiscal criteria fulfilment. Generally speaking, the old EU countries recorded unsatisfactory outcomes (excluding the Scandinavian economies, which have been running very well in this field). The situation deteriorated after the latest financial crisis. Under such circumstances a question arises: can we talk about the sustainability of public finances in the old EU member states? If so, what is the level of this sustainability in the short and long run?

## SHORT-TERM SUSTAINABILITY

The short-term sustainability was assessed using the equation 1. It allowed checking whether the primary fiscal balance was higher than the cost of the debt service each year. The results are shown in the table 2.

Table 2

The outcomes of the test for short term sustainability (in % of GDP)

	BE	DK	DE	IE	EL	ES	FR	IT	LU	NL	AT	PT	FI	SE	UK
1996	-4,0	-2,5	-3,4	-0,3	n/a	-5,4	-3,9	-6,6	1,3	-1,7	-4,4	-4,7	-3,2	-3,1	-4,1
1997	-2,3	-1,2	-2,8	1,3	n/a	-3,9	-3,6	-3,0	3,6	-1,3	-2,4	-3,7	-1,2	-1,6	-2,1
1998	-1,0	-0,4	-2,4	2,0	n/a	-2,9	-2,4	-3,0	3,4	-0,9	-2,7	-4,4	1,6	0,9	-0,2
1999	-0,6	0,9	-1,5	2,4	n/a	-1,3	-1,6	-1,8	3,5	0,3	-2,6	-3,0	1,7	0,8	0,8
2000	-0,1	1,9	1,0	4,8	n/a	-1,0	-1,3	-1,3	5,7	1,9	-2,1	-3,2	6,9	3,2	1,2
2001	0,2	1,1	-3,1	0,9	n/a	-0,5	-1,4	-3,4	6,0	-0,4	-0,6	-4,8	5,0	1,4	0,4
2002	0,1	0,0	-3,9	-0,3	n/a	-0,4	-3,1	-3,1	2,3	-2,1	-1,3	-3,3	4,1	-1,5	-2,0
2003	-1,8	-0,1	-4,1	0,4	n/a	-0,4	-3,9	-3,4	0,6	-3,0	-1,7	-4,4	2,4	-1,3	-3,4
2004	-0,2	2,1	-3,7	1,4	n/a	0,0	-3,5	-3,6	-1,0	-1,8	-4,8	-6,2	2,2	0,3	-3,6
2005	-2,6	5,0	-3,3	1,6	n/a	1,2	-3,2	-4,2	0,2	-0,3	-2,5	-6,2	2,6	1,8	-3,5
2006	0,2	5,0	-1,5	2,8	-6,1	2,2	-2,3	-3,6	1,4	0,2	-2,5	-4,3	3,9	2,2	-2,9
2007	0,0	5,0	0,3	0,2	-6,7	2,0	-2,5	-1,5	4,2	0,2	-1,3	-3,0	5,1	3,3	-3,0
2008	-1,1	3,2	0,0	-7,0	-9,9	-4,4	-3,2	-2,7	3,3	0,2	-1,5	-3,8	4,2	2,0	-5,1
2009	-5,5	-2,8	-3,0	-13,9	-15,2	-11,0	-7,2	-5,3	-0,5	-5,5	-5,3	-9,8	-2,5	-0,7	-10,8
2010	-4,0	-2,7	-4,1	-32,4	-11,1	-9,4	-6,8	-4,2	-0,6	-5,0	-4,5	-11,2	-2,6	0,0	-9,6
2011	-3,9	-2,1	-0,9	-12,6	-10,1	-9,4	-5,1	-3,5	0,3	-4,3	-2,6	-7,4	-1,0	-0,1	-7,6
2012	-4,1	-3,7	0,1	-8,0	-8,6	-10,3	-4,9	-3,0	0,1	-4,0	-2,3	-5,5	-2,1	-0,9	-8,3
2013	-2,9	-1,1	0,1	-5,7	-12,2	-6,8	-4,1	-2,8	0,6	-2,3	-1,5	-4,9	-2,4	-1,4	-5,8
2014	-3,2	1,8	0,4	-3,9	-2,5	-5,6	-4,3	-3,0	0,5	-2,8	-2,9	-4,6	-2,7	-2,2	-5,5
2015	-2,6	-2,8	0,2	-2,9	1,1	-4,5	-4,1	-2,6	-0,4	-2,2	-2,0	-3,2	-2,5	-1,6	-4,6

n/a – data not available

Source: own elaboration based on Eurostat and European Commission's Directorate General for Economic and Financial Affairs data

The analysis of data proves that most of old EU countries have failed the test for short term sustainability. Four out of fifteen countries did not fulfil the short term criterion not even once during the 20-year period. Next 8 countries failed in most years. One country, Finland, failed in 9 out of twenty years. Only one country – Luxembourg – failed four times only.

It is worth mentioning, that generating primary deficits was very important, but not the only problem here. On the contrary, even some PIIGS countries were able to produce significant primary surpluses. For example, Italy created primary deficit only once over last twenty years. Of course, primary deficits were also recorded (sometimes significant, as in other PIIGS countries) but to a large extent due to the financial crisis. The second problem was the value of public debt servicing costs. In most cases they were significantly higher than the primary surpluses. These costs depend not only on the public borrowing interest rate but also on the total accumulated volume of public debt. The situation turned worse after the financial crisis started, as might be expected. Higher public expenditures and lower revenues generated excessive deficits, financed by public borrowing. That raised the level of investment risk and increased risk premium for investors buying government bonds and bills. The general effect was a significant increase of public debt service expenditures.

## LONG-TERM SUSTAINABILITY

The long term maturity was tested using the present value of discounted primary deficits in the years 1996-2015, according to the equations 4 and 5. The results are shown in table 3.

Table 3

The outcomes of the test for long term sustainability (in% of GDP)

Country	A*	B*
Belgium	41,08	-87,40
Denmark	40,09	-27,91
Germany	13,05	-44,37
Ireland	-2,85	-72,87
Greece	-5,36	-108,77
Spain	-5,13	-70,70
France	-10,66	-70,01
Italy	31,17	-85,13
Luxemb.	30,57	22,98
Netherl.	11,53	-60,28
Austria	9,20	-58,76
Portugal	-20,60	-80,11
Finland	44,25	-11,07
Sweden	33,33	-37,01
UK	-12,59	-60,45

\* A – the sum of discounted primary balances; B – the sum of discounted primary balances less the volume of public debt existing in  $t = 0$  (in 1996)

Source: own elaboration based on Eurostat and European Commission's Directorate General for Economic and Financial Affairs data

The results show that 6 out of 15 countries generated negative present value of the sum of discounted primary balances. United Kingdom and France, next to Portugal, Ireland, Greece and Spain, belonged to that group. It means that not only weaker economies, but also relatively strong EU member states can have problems with long term sustainability of public finance. The remaining 9 countries generated significant

accumulated discounted primary surplus. However the volume of the already existing debt became an obstacle for most countries to reach the sustainability in public finance. The sum of discounted primary balances remained insufficient to cover the already existing debt in 14 out of 15 countries. The only exception was Luxembourg.

## CONCLUSIONS

It is evident that old EU economies have significant problems with Maastricht Criteria fulfilment. Most of them have also failed the test for short term sustainability. However, the results for long term sustainability prove that they were generally able to generate primary surpluses in long run. In 9 out of 15 countries the sums of discounted primary fiscal balances were strongly positive. These economies strive for sustainability in their fiscal policies and they have potential to achieve it in long run.

The main obstacle is the volume of already accumulated public debt (sometimes extremely high) and, relevant to it, high costs of debt service. The outcomes of the research prove the hypotheses put forward in the “Introduction” were true. To support the idea of sustainable public finance, the governments should try to diminish the volume of debt by tightening fiscal policies and trying to make public finances more resistant for economic slowdowns and crises.

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