

THE BRAKE PUBLIC DEBT RULE AS AN INSTRUMENT TO STABILIZE THE DEBT - RESULTS FOR POLAND

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Abstract

The public debt brake rule is the numerical fiscal rule applied the first time in Switzerland. In this paper we use the expenditure rule that is the core of the brake public debt rule for analyses the general government deficit and the government debt in Poland. When we use the brake public debt rule we assume that government spending does not result from a predetermined path, but they are linked to the level of revenue and variable economic situation. Unlike the original version of the brake public rule, in the paper we include the total expenditure and the total revenues being the sum of tax and non-tax revenues assumed in the Budget Laws. The potential GDP was determined on the basis of the HP filter. In addition my contribution to the topic is to investigate whether the implementation of the public debt brake rule in Poland will stabilize the general government deficit and the government debt over the business cycle and will reduce the ratio of debt to GDP.

Key words: brake public debt rule, expenditure rule, balanced budget, business cycle,

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1. Introduction

The important goal of fiscal policy is the achievement of balanced budget over the business cycle. Moreover the government has not only fulfill the Maastricht criteria - the general government deficit lower than 3% of GDP and the general government debt lower than 60% of GDP but also the fiscal policy makers should strive to achieve economic growth and they should seek to maintain the general government's budget at close to balance or in surplus. Government making decisions about the fiscal policy may affect on the realization of sustainable economic development. The relationship between public debt and growth is also presented in Mitze and Matz (March-April 2015).

Often used method of fiscal decision-making are decisions based on the rules. In this paper we present the expenditure rule that is based on the Swiss debt brake model. The model of fiscal policy, which we use, should lead to the sustainability of a zero deficit over the business cycle.

The other authors studied also the debt brake model (see for example: Heinemann et al., October 2016, Danninger, 2002; Brandner et al., September 2005) In addition, the optimal expenditure rule that is the solution of control theory problem is studied by Przybylska-Mazur (2016, 2017). About Taylor rule for fiscal policy write Kliem and Kriwoluzky (2014) and Kendrick and Amman (2011). The optimal fiscal policy in a stochastically growing economy analyzes Tamai (September 2016).

2. The importance of fiscal policy based on rules

The fiscal policy involves the government decisions on the size and structure of public expenditure, general government deficit and general government debt. Fiscal sustainability, as an integral part of macroeconomic stability will strengthen the protection of the economy against various types of shocks. One of the ways of making decisions are the decisions based on rules. The rules could prevent pro-cyclical fiscal policies as well. The fiscal policy, bounded by rules on the expenditure side, is an important component in the success of reducing the general government deficit and general government debt.

When we conduct the rules-based fiscal policy, it is strengthened the prudence and the objectivity in the realization of fiscal policy. The fiscal rules have a significant impact on the economy. One of the benefits is the creation of favorable conditions for increase of GDP growth. The decisions on the basis of the rules, including the expenditure rule, allow to coordinate the budgetary expenditure.

Moreover, we note that Article 5 of the Council Directive of the European Union (COUNCIL DIRECTIVE 2011/85/EU of 8 November 2011 on requirements for budgetary frameworks of the Member States) says that „Each Member State shall have in place numerical fiscal rules which are specific to it and which effectively promote compliance with its obligations deriving from the TFEU (ed. of the Treaty on the functioning of the European Union) in the area of budgetary policy over a multiannual horizon for the general government as a whole...” Whereas, the Article 7 of this Directive requires that „the annual budget legislation of the Member States shall reflect their country-specific numerical fiscal rules in force”.

Currently in Poland it hold true the modification of stabilizing expenditure rule. Therefore, in this paper we study the other form of the expenditure rule. We analyse the expenditure rule that follows from Swiss debt brake model. Based on this model we determine the public expenditure equals to the tax revenue adjusted for business cycle fluctuations. A balancing account is created to protect against the negative impact of the recession on general government deficit. Therefore, the basis for the analysis work is to determine the expenditure rule in the context of a balanced budget over business cycle.

3. Context of expenditures in The Debt Brake Rule

The rule called the debt brake was first applied in Switzerland in 2003. The debt brake rule includes four main elements (Brandner et al., September 2005):

- ✓ the simple expenditure rule with a binding clause,
- ✓ an exceptional circumstances,
- ✓ a stabilization account,
- ✓ the use of extraordinary revenue.

In this paper we focus on the modification of first element of the debt brake rule – the modification of the simple expenditure rule that is core of debt brake rule. In the original version of Swiss debt brake, the maximum level of total expenditures depends on the tax revenues. In this paper we take into account the expenditure rule in which the maximum level of total expenditures, this is the expenditure ceiling, is the sum of two terms. The first term is the maximum level of expenditure depends on the tax revenues for the same period and the second term is the level of non-tax expenditures. We assume that the non-tax expenditures are equal to the revenues and funds in the EU and other non-refundable sources (before accession to the EU - foreign income). This rule takes into account the current stage of the business cycle. Thus:

$$A_t^{total} = A_t^T + A_t^{NT} \quad (1)$$

where:

A_t^{total} - the total expenditures,

A_t^{NT} - the non-tax expenditures,

A_t^T - the maximum expenditures in the estimated year t depended on tax revenues,

We calculate them from the following formula:

$$A_t^T = i_{Y_t} \cdot T_t^T \quad (2)$$

where:

T_t - the tax revenue according to preliminary budget,

i_{Y_t} - the output gap i.e. the ratio between the potential GDP, and the current GDP; $i_{Y_t} = \frac{Y_t^P}{Y_t}$.

We treat the output gap as a business cycle variable.

In the original version of Swiss debt brake Y_t^P was the estimated real trend GDP. In this paper we take into account the potential GDP Y_t^P . We use the Holdrick Prescott filter for calculation Y_t^P . The variable Y_t is the real GDP or the forecast of GDP.

If $Y_t^P > Y_t$, that is $i_{Y_t} > 1$, then we have a recessive episode and expenditures are higher than revenues.

If $Y_t^P < Y_t$, that is $i_{Y_t} < 1$, then we have a boom period and revenues exceeds expenditures.

In accordance with the stage of the business-cycle, the maximum total expenditures A_t is larger or smaller than the revenues of the central government. This generates deficits or surpluses and this provides the balanced budget over the entire cycle.

The budget restriction is presented in form the following equation:

$$D_t - D_{t-1} = i \cdot D_t + G_t - T_t^{total} \quad (3)$$

The Swiss debt brake does not differentiate between interest payment $i \cdot D_t$ and primary expenditure, the difference $G_t - T_t^{total}$ between the government's expenditures G_t without interest and the total revenue. Thus:

$$D_t - D_{t-1} = A_t^{total} - T_t^{total} \quad (4)$$

where:

D_t represents the general government debt at time t ,

$D_t - D_{t-1}$ is the increase in the government debt.

That is determined by general government deficit, the difference between the maximum level of total expenditures and the maximum level of total revenues.

If this is positive, we have the primary deficit; while if it is negative, we have the primary surplus.

Since we assume that the non-tax expenditures A_t^{NT} are equal to the revenues and funds in the EU and other non-refundable sources (before accession to the EU - foreign income) T_t^{NT} , we have the following budget restriction in simplified form:

$$D_t - D_{t-1} = A_t^{total} - T_t^{total} = (A_t^T + A_t^{NT}) - (T_t^T + A_t^{NT}) = A_t^T - T_t^T \quad (5)$$

Thus the excess spending increases the government debt.

From the formula (2) $A_t^T = i_{Y_t} \cdot T_t^T = \frac{Y_t^P}{Y_t} \cdot T_t^T$, thus we can make the budget balance depend on tax revenue in following form:

$$A_t^T - T_t^T = \frac{Y_t^P - Y_t}{Y_t} \cdot T_t^T \quad (6)$$

From the equation (6) follows the budget balance $A_t^T - T_t^T$ is proportional to tax revenues T_t^T and fluctuates with the deviation of the current GDP from the potential GDP in percentage of the current real GDP.

Thus, the increase in the government debt is also proportional to tax revenues T_t^T and the deviation of the current GDP from the potential GDP in percentage of the current real GDP:

$$D_t - D_{t-1} = \frac{Y_t^P - Y_t}{Y_t} \cdot T_t^T \quad (7)$$

If $Y_t < Y_t^P$, the output gap is positive, thus the nominal government debt increases, $D_t - D_{t-1} > 0$.

This shows that the national economy is in a phase of weak growth or in a recession. If the government follows the Swiss debt brake, the tax expenditures will exceed the tax revenues and this will lead to an increase in the government debt.

If $Y_t > Y_t^P$ thus the nominal government debt decreases, $D_t - D_{t-1} < 0$.

At the time the economy is in a boom phase in which the tax revenues exceeds the tax expenditure. The positive budget balance is automatically used to pay off debt and the government debt decreases.

If $Y_t = Y_t^P$, the real GDP follows the path of potential GDP, thus the nominal value of debt remains constant $D_t - D_{t-1} = 0$ and we have balanced budget.

Since the Maastricht criteria are based on the debt-to-GDP and deficit-to-GDP ratios, we have the following equation describing the government debt-to-GDP ratio in period t that depends on the tax revenue-to-GDP ratio in period t and government debt-GDP ratio in previous period:

$$\frac{D_t}{Y_t} = \left(\frac{Y_t^P - Y_t}{Y_t} \right) \cdot \frac{T_t^T}{Y_t} + \frac{D_{t-1}}{Y_{t-1}} \quad (8)$$

Moreover we get the change of the government debt-to-GDP ratio described by the following equation:

$$\frac{D_t}{Y_t} - \frac{D_{t-1}}{Y_{t-1}} = \left(\frac{Y_t^P - Y_t}{Y_t} \right) \cdot \frac{T_t^T}{Y_t} - \left(\frac{Y_t - Y_{t-1}}{Y_t} \right) \cdot \frac{D_{t-1}}{Y_{t-1}} \quad (9)$$

Thus, the change of the government debt-to-GDP ratio depends on:

- 1) the product of the tax-to-GDP ratio and the output gap,

2) the product of growth of real GDP and the debt-to-GDP ratio in the previous period. and we have following:

- ✓ If $Y_t < Y_t^P$ the debt brake leads to an increase in the debt-to-GDP ratio. If $Y_t > Y_t^P$, this ratio decreases.
- ✓ The positive growth rate of the economy $\frac{Y_t - Y_{t-1}}{Y_t} > 0$ reduces, ceteris paribus, the debt-to-GDP ratio.
- ✓ If the economy follows the path of potential GDP, the debt-to-GDP ratio falls, as real GDP increases with the given nominal government debt.

4. The empirical analysis

For the analyzes we use the tax revenues (annual data), the total revenues (annual data) and budget expenditures (annual data) (data published in the budgetary laws). We take into account the data for Poland from the period 2003 to 2017. We use also the annual GDP data (in mln zł) the general government debt for Poland from the period 2003-2016 (data published by Central Statistical Office, source: www.stat.gov.pl) and also the GDP forecast for 2017 that is based on the assumptions of the State Budget Project for 2017. The potential GDP is determined on the basis of the Hodrick – Prescott filter.

Table 1: The output gap, the business cycle phase and the relation between total budget revenues and the total budget expenditures

Year	The output gap	The business cycle phase	The relation between total budget revenues and the total budget expenditures
2003	0,8930	boom period	revenue > expenditure
2004	1,0200	recessive episode	revenue < expenditure
2005	1,0156	recessive episode	revenue < expenditure
2006	1,0060	recessive episode	revenue < expenditure
2007	0,9974	boom period	revenue > expenditure
2008	0,9971	boom period	revenue > expenditure
2009	1,0004	recessive episode	revenue < expenditure
2010	1,0041	recessive episode	revenue < expenditure
2011	0,9967	boom period	revenue > expenditure
2012	0,9998	boom period	revenue > expenditure
2013	0,9987	boom period	revenue > expenditure
2014	1,0041	recessive episode	revenue < expenditure
2015	1,0165	recessive episode	revenue < expenditure
2016	1,0439	recessive episode	revenue < expenditure
2017	0,8667	boom period	revenue > expenditure

In the table 1 we show the output gap that we treat as a business cycle variable. The table 1 contains also the conclusions on the business cycle phase and the relation between total budget revenues and the total budget expenditures arising from the output gap. In table 2 we

present the maximum levels of total expenditures calculated on base the levels of revenue assumed in the Budget Laws and on base level of GDP. We compare these levels with the levels of total expenditure included in the Budget Laws.

Table 2: The maximum levels of total expenditures and the levels of expenditure

Year	The maximum level of total expenditures (in mln zł)	The level of total expenditures under the Budget Laws (in mln zł)
2003	140864,01	194431,7
2004	157260,04	199851,9
2005	177125,77	209703,7
2006	196328,32	225828,7
2007	228451,78	258 952,5
2008	281229,86	308 982,7
2009	303140,84	321 221,1
2010	249932,26	301 220,8
2011	272355,13	313 344,4
2012	293701,09	328 765,7
2013	299028,64	334 950,8
2014	278803,54	325 287,4
2015	301643,09	343 277,8
2016	325938,43	368548,5
2017	285279,91	384773,5

In next table we present the budget balance calculated on base formula (6).

Table 3: The budget balance

Year	The budget balance (in mln zł)	The budget balance
2003	-14833,64	surplus
2004	2707,45	deficit
2005	2422,03	deficit
2006	1046,36	deficit
2007	-500,74	surplus
2008	-662,24	surplus
2009	106,04	deficit
2010	925,66	deficit
2011	-789,26	surplus
2012	-65,04	surplus
2013	-356,66	surplus
2014	1021,32	deficit
2015	4445,27	deficit
2016	12129,91	deficit
2017	-40148,10	surplus

Thus, when the level of revenue and the level of GDP assumed in Budget Law for 2017 will be achieved, the budget balance in 2017 will be negative, ie, the government expenditures will be less than the revenues.

The table 4 contains the government debt-to-GDP ratio that is calculated on based the formula (8). These ratios are compiled with the real government debt-to-GDP ratios. In this table we present also the changes of government debt-to-GDP ratio that depends on the product of the tax-to-GDP ratio, the output gap, the growth of real GDP and the debt-to-GDP ratio in the previous period.

Table 4: The government debt-to-GDP ratios, the real government debt-to-GDP ratios and the changes of government debt-to-GDP ratio

Year	The government debt-to-GDP ratio (in %)	The real government debt-to-GDP ratio (in %)	The change of government debt-to-GDP ratio
2003	X	47,1	Decrease
2004	X	45,7	Increase
2005	40,6	47,1	Increase
2006	44,4	47,7	Increase
2007	44,1	45	Decrease
2008	40,5	47,1	Decrease
2009	43,5	50,9	Increase
2010	48,3	53,1	Increase
2011	50,4	54,1	Decrease
2012	50,3	53,7	Decrease
2013	51,3	55,7	Increase
2014	53,5	50,2	Increase
2015	48,8	51,1	Increase
2016	49,5	54,4	Decrease
2017	50,8	x	Decrease

We can note that the government debt-to-GDP ratio in 2017 will be equal to 50,8%. Furthermore when the tax revenues-to-GDP ratio and the GDP from the Budget Act will be achieved we can say that the government-to-GDP ratio decrease in 2017.

5. Conclusion

In this paper we analyzed the modification of the simple expenditure rule that is core of brake debt rule. We took into account output gap that was treated as a business cycle variable. Under the relation between total budget revenues and the total budget expenditures arising from the output gap we determined the business cycle phase.

The result of the research was primarily the determination of the maximum level of government expenditure - the expenditure ceiling resulting from the application of core of the brake debt rule in Poland. We compare these levels with the government expenditures established in the Budget Acts. On the basis of the calculated expenditure ceilings resulting from the application of core of the brake debt rule in Poland we determined the government budget balance and general government debt in Poland. Having regard to the Maastricht criteria we calculated the government debt-to-GDP ratio in period t that depends on the tax

revenue-to-GDP ratio in period t and government debt-GDP ratio in previous period and we evaluated the changes of government debt-to-GDP ratio. Moreover, the brake debt rule applied for Poland allowed to check the fulfillment of fiscal criteria from Maastricht in Poland.

The presented research may be a advice for fiscal policymakers, because the presented rule allows to determine the total budget expenditures on the basis of budgetary revenues established in the Budget Laws and taking into account the variable representing the business cycle. The presented rule can be used by the policymaker because it allows to monitor the real budget revenues and budget expenditures. That allows to compare them with the optimum level of budget expenditure and with the assumed level of budget revenues.

By applying the presented rule, policymakers can make decisions that affect the general government deficit and general government debt levels, also in the context of fulfillment of Maastricht criteria. Using the presented rule, policymakers can also estimate the general government level in the next year.

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