

THE SAFE CEILING OF LITHUANIAN BUDGET DEFICIT

Arvydas Kregždė*

Vilnius University, Lithuania

Abstract. *The paper deals with the impact of the budget deficit on the outstanding debt of Lithuania. The ceiling of 3%, which is set in the Maastricht Treaty, is used as a benchmark to simulate changes of the outstanding debt. In addition, the influence of the interest paid on the debt to the primary budget deficit is analysed. The analysis shows that the rule of the Maastricht Treaty concerning the ceiling of 3% for a budget deficit is not sufficient to have a steady or non-increasing state of the debt of Lithuania. Great varieties of GDP growth and the initial outstanding stock of the debt in the EU countries allow a very substantial growth of the debt as well as a decrease of the debt for an individual country, despite the limit of 3% being in place. In order to have a non-increasing debt of Lithuania, the ceiling of the budget deficit should be flexible and lower than that set by the Maastricht Treaty. The conclusion is based on statistical data of the EU countries and the model of integral presentation form of the debt applied in the Lithuanian case.*

Key words: *budget, deficit, debt, sustainability*

1. Introduction

Since September 2008, the sovereign debt issue has attracted considerable attention. The collapse of Lehman Brothers led to a fundamental reassessment of the default risk of developed and emerging countries. In the euro area, the sovereign debt markets in several countries came under an unprecedented stress. The tension was mostly determined by a huge increase of the sovereign debt of Greece, which was the result of a considerable budget deficit of the country. A substantial increase of the interest rate on Greece bonds closed a possibility for Greece to enter financial markets to refinance the debt. The restructuring of the Greece debt in March 2012 created a new angle in treating the risk of the sovereign debt.

A global debt crisis directly reached Lithuania and other Baltic countries at the very beginning of it. The credit risk of these countries jumped up at the end of 2008 and the beginning of 2009. A contagious effect of the sovereign debt problems in Iceland stressed the financial market of the Baltic countries. A significant drop of the GDP in 2009 determined a budget deficit in Latvia and Lithuania. During the last 5 years, the

* *Corresponding author:*

Department of Differential Equation and Numerical Analysis, Faculty of Mathematics and Informatics,
Vilnius University, Lithuania, Naugarduko 24, LT -03225 Vilnius, Lithuania;
e-mail: arvydas.kregzde@mif.vu.lt

budget deficit exceeded 3% of the GDP¹, and the government debt in these countries has doubled.

The issue of the government debt is always on the agenda for academicians and politicians. Increase of the government debt during the last 5 years in the EU has a huge impact on the economic development of both the EU and the entire world. A growing sovereign debt creates additional pressure for the countries' budgets in servicing the debt. At the same time, a growing sovereign debt increases the credit risk of the country, and this implies a higher interest rate on the debt. A high budget deficit is the main reason for the increase of the debt.

In order to restrict the sovereign debt, the European Union (EU) has established limits for the government debt and the budget deficit. They are called the Maastricht criteria which were implemented by the Maastricht Treaty². The criteria were set forth in the Stability and Growth Pact (SGP)³ later on. According to the Maastricht Treaty, a budget deficit for a particular country should not exceed 3% of its GDP, and the government debt should be below 60% of the GDP. The criteria are very simple to check and have a great economic point.

There are many papers that justify the figures of these criteria. By using statistical data, Baum et al. (2012) and Checherita-Westphal et al. (2012) proved that the budget deficit supports the growth of the GDP when it does not exceed 67%, and the country has some pressure when the budget deficit exceeds 70%. Reinhart and Rogoff (2010) have found that the external countries' debt exceeding 60% of the GDP significantly reduces the GDP growth. By using empirical data, Kumar and Woo (2010) have proved that the amount of the debt has a nonlinear effect on the economic growth.

Despite the above fact, Governatori and Eijffinger (2004) suggest some adjustments to the Maastricht criteria in order to consider other economic data such as the GDP growth. Suggestions to modify the Maastrich criteria are presented in Fischer et al. (2006), Buti et al. (2003), Holm-Hadulla et al. (2012), Hauptmeier et al. (2011).

It is well known that the 3% target of the budget deficit in the Maastricht criteria has been set on the basis of a simple calculation as the figure stabilizing the debt ratio at 60%, assuming a 5% increase in the nominal GDP growth rate (3% of potential growth and 2% of inflation). Mathematically, this follows from the formula below:

$$\lim_{t \rightarrow \infty} debt(t) = \frac{budget\ deficit}{nominal\ GDP\ growth\ rate} = \frac{3}{5} = 0.6 = 60\% .$$

¹ The exception is 2012 when the budget deficit of Latvia was 1.2%

² Treaty on the European Union was signed on 7 February 1992 by the members of the European Community in Maastricht. It led to creation of a single currency of the European Union – the euro.

³ The Stability and Growth Pact is an agreement among 27 Member States of the European Union to facilitate and maintain the stability of the Economic and Monetary Union (EMU).

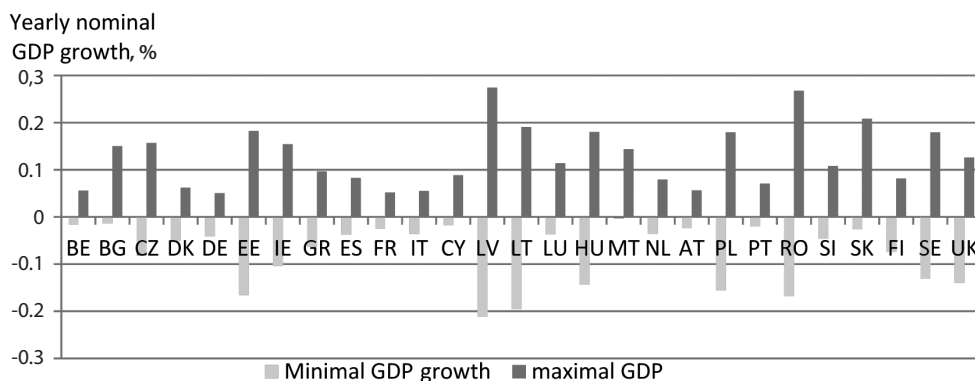


FIG. 1. Minimum and maximum value of the nominal GDP growth in the EU countries, 2000–2012
Source: Eurostat, author's calculations.

It is worth noting that the limit does not depend on the initial debt and takes place if the budget deficit and the nominal GDP growth are constant. When the budget deficit and the nominal GDP growth are not constant, we can apply the relationship above if the limits for the budget deficit and the nominal GDP growth are 3% and 5%, respectively.

If the outstanding debt is less than or equal to 60%, the debt tends to approach the limit from below. This means that the debt is increasing towards the limit. Where the outstanding debt exceeds 60%, the debt tends to approach the limit from above. This means that the debt is decreasing.

The target of 3% has some weak points, because it is based on an asymptotical behaviour of the debt. First of all, for the countries that have a debt lower than 60%, it allows to increase the debt even in case the GDP growth is exceeding 5%. For the countries with a debt higher than 60%, the ceiling of the budget deficit of 3% does not guarantee that the debt will not rise if the nominal GDP growth rate is less than 5%.

In practice, the nominal GDP growth varies from one country to another and from one year to another. Figure 1 presents the maximum and minimum values of the nominal GDP growth in the EU countries from 2000 to 2012.

As we see in Fig. 1, the magnitude of changes of the GDP growth is very high. The GDP growth volatility is higher for the new EU member states. The highest volatility is observed in Latvia, Lithuania, Romania, Poland, Hungary, and Estonia.

The amount of the outstanding debt for the EU countries varies greatly. Figure 2 shows the maximum and minimum levels of the debt in the EU countries in 2000–2012.

The outstanding amount of the debt and the rate of the GDP growth have a crucial impact on the further development of the debt. With a budget deficit of 3%, the debt can increase or decrease during a year, depending on the GDP growth rate and the initial amount of the debt.

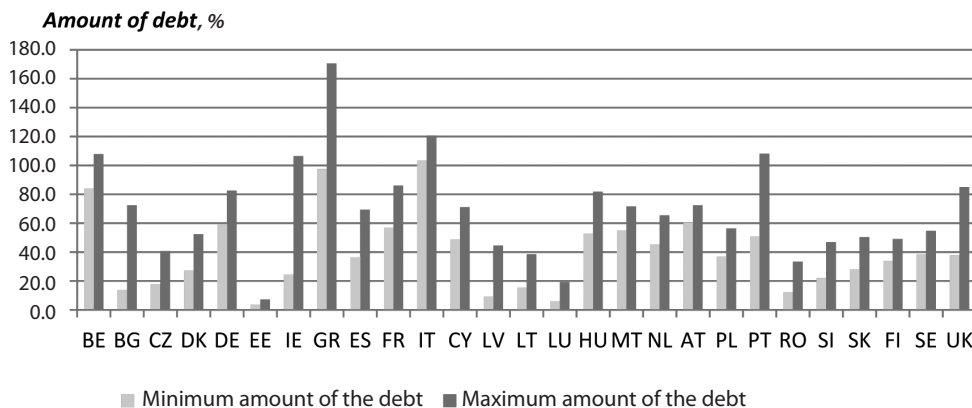


FIG. 2. Minimum and maximum levels of debt as a percentage of GDP in the EU countries, 2000–2012
 Source: Eurostat, author's calculations.

The aim of this study was to determine the impact of the ceiling of the budget deficit set by the Maastricht Treaty for the further development of the debt of Lithuania. We study the impact of the relationship between the country's GDP growth rate, the budget deficit, and the amount of the country's initial outstanding debt on the further development of the debt over time in the EU countries. In relation to the above, we analyse the impact of the budget deficit constraint of 3% to the steady state of the debt of Lithuania. To this end, we analyse the impact of the outstanding debt and the interest rate paid on the debt to the primary deficit of Lithuania. We attempt to answer the question how the debt of the country can change because of unfavourable conditions, despite the budget deficit being within the limits set by the Maastricht Treaty. We mainly focus on Lithuania's data and simulate the debt in case the budget deficit is equal to 3%. We use the finite time horizon instead of the asymptotical approach to evaluate the development of the debt.

We used statistical data of the Eurostat⁴ (European Commission, 2013) for the analysis and an integral model of the development of the debt for simulation.

2. The steady state of the debt

International institutions⁵ and academicians have analysed the sustainability of the debt over an unlimited period, i.e. from the current moment to infinity. The concept of sustainability was discussed by a number of academicians (see Blanchard, 1990). The definition used by international institutions is non-operational one, therefore, it deserves

⁴ The Eurostat is the statistics office of the European Union.

⁵ European Commission, 2011, European Central Bank (ECB), 2011, and IMF, 2011.

some criticism (Wyplosz, 2007, Polito and Wickens, 2012, etc.). In this part, we will derive a condition for the debt to be decreasing from the current moment to the next year or several next years. This would be the condition for a monotonically decreasing debt. The line separating the set of the GDP growth parameters and the budget deficit for the increasing and decreasing debt is called by us the steady state line of the debt. The steady state of the debt was discussed by Morris et al. (2006).

For the further consideration, we use the integral expression form of the debt presented by Kregždė (2012). This will enable us to consider the monotonicity of the debt in the periods of one year and of several years. The current debt can be expressed in the following way:

$$b(t) = e^{-\int_0^t g(s) ds} [b_0 + \int_0^t \mu(x) e^{\int_0^x g(s) ds} dx], \quad (1)$$

here, variables g and μ are the functions of time t ,

$b_0 = b(0)$ is the ratio of the initial stock of the debt to GDP,

g is the nominal GDP growth continuously compounded,

μ is the ratio of the budget deficit to the GDP.

The equality $b(t) = b_0$ expresses the steady state of the debt, and the inequality $b(t) \leq b_0$ expresses the condition for the debt to be non-increasing.

The values of the variable μ reflect the fiscal policy of the government. Mendoza et al. (2008) developed a model which includes government's responses to the amount of the debt in managing the deficit. Some modifications of this model were applied for the Eastern and Central European countries by Cuestas and Steahr (2010). Their analysis includes the Lithuanian case as well.

Now, we will illustrate the relationship between μ and g according to formula (1). In order to simplify the presentation, we consider g and μ as constants during a period of one year. This means that the deficit and the GDP growth are constant during a period of one year⁶. In case of the initial stock of the debt being equal to 40% of the GDP⁷, the relationship between the budget deficit and the GDP growth in a one-year period is presented in Fig. 3.

The line in Fig. 3 represents the steady state of the debt. This is the line of an equilibrium state. The line in Fig. 3 separates the areas of non-increasing and increasing debt. The area below the line in Fig. 3 represents the relationship between the amount of the deficit and the GDP growth which ensures a decreasing debt. The greater is the growth of the GDP, the bigger budget deficit allows keeping the debt to be non-increasing. A low rate of the GDP growth forces to keep the budget deficit close to zero in order not to

⁶ The model allows to consider more frequent statistical data.

⁷ Lithuania's debt was 40.7% of the GDP in 2012.

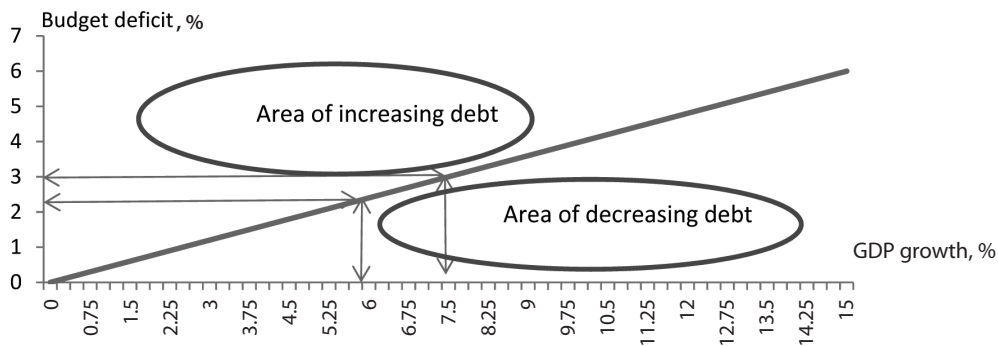


FIG. 3. The steady state of the debt when the initial outstanding stock of the debt is equal to 40%

Source: author's calculation.

increase the debt. A high level of the GDP growth allows not to increase the debt when having a sufficiently high deficit. Figure 3 shows that the deficit of 3% ensures a monotonically decreasing debt only in case of the GDP growth higher than 7.5%. In case of a lower GDP growth, the deficit should be lower than 3% in order to ensure a monotonically decreasing debt.

The slope of the steady state line depends on the initial debt. When the initial debt is higher, the slope of the line of the steady state, according to formula (1), is greater. For example, if the initial debt is 60%, then the deficit of 3% ensures a monotonically decreasing debt when the GDP growth is higher than 5%. For the initial debt of 100%, a monotonically decreasing debt can be achieved keeping the deficit at the level of 3% when the GDP growth rate is 3% or higher. As we see, the requirement to keep the budget deficit below 3% guarantees a non-increasing debt at the end of the year, under a fixed nominal growth of GDP, for the countries having a high outstanding debt. This phenomenon was noted by Saraceno and Monperrus-Veroni (2004). They proposed to have specific limits for the budget deficit depending on the outstanding stock of the debt.

3. The ceiling of the budget deficit for a monotonically decreasing debt

We have previously demonstrated that a higher initial debt requires a lower deficit in order to achieve the steady state of the debt under a given level of the nominal GDP growth. Figure 4 presents the steady state line of the debt during a period of one year when the budget deficit is equal to 3%. In this part, we will find a condition for the debt to be steady during a one-year period and show that the conditions are very different for various EU countries.

Now, we will focus on investigating the development of the steady state of the debt in Lithuania. The deficit of 3% guarantees a non-increasing debt for Lithuania, if its GDP growth is higher than 7.5%. According to the projection of the European Commission,

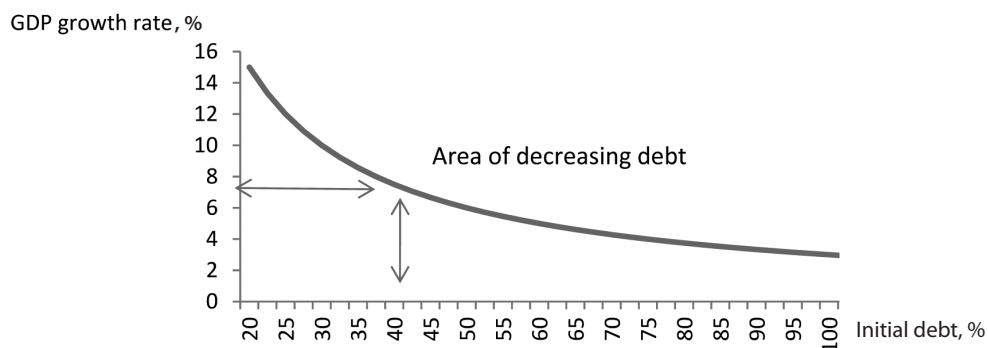


FIG. 4. The steady state of the debt for the budget deficit of 3%

Source: author's calculations.

2012 for Lithuania, its real GDP growth will reach 3.1% and the GDP deflator will be 2.7% in 2013. Taking the nominal GDP growth of 5.8% in 2013, from Fig. 3 we can find approximately that the steady state of the debt of Lithuania, which is equal to around 41%, can be achieved with the budget deficit being 2.4% or lower. This is the sealing for the deficit for a monotonically decreasing debt. Therefore, the target to have a budget deficit below 3% of the GDP allows to increase the debt of the country, if the deficit is above 2.4%. In order to have the steady state of the debt, the ceiling for the deficit should be reduced to 2.4%.

The debt of Lithuania was 22.3% in 2000. With such a small debt, the steady state of the debt can be achieved (see Fig. 4) by keeping the budget deficit at 3% just in case if the GDP growth rate exceeds 15%. The average growth rate of Lithuania from 2000 to 2012 was 7.4%. Therefore, the deficit of 3% of the GDP would force Lithuania to increase the debt.

Figure 5 shows the potential increase of the debt of Lithuania by keeping the budget deficit equal to 3% and taking a historical nominal GDP growth rate⁸. It is worth noting that historically the deficit of the Lithuanian budget was less than 3% in the period 2002–2007. The simulation shows that to keep the budget deficit at the level of 3% is not enough to have a non-increasing debt, even when having a very strong GDP growth. The phenomenon arises, because the debt of Lithuania was sizeable to less than 60%. Despite the fact that the budget deficit was within the limits set by the Maastricht criteria, the Lithuanian debt was in a position to increase.

As mentioned above, the steady state of the debt depends on the initial debt of the countries and the nominal GDP growth. Figure 6 presents the data of possible budget deficits for the EU countries that will not increase the debt over a one-year period.

⁸ Formula (1) was used for the simulation. Annual statistical data were applied.

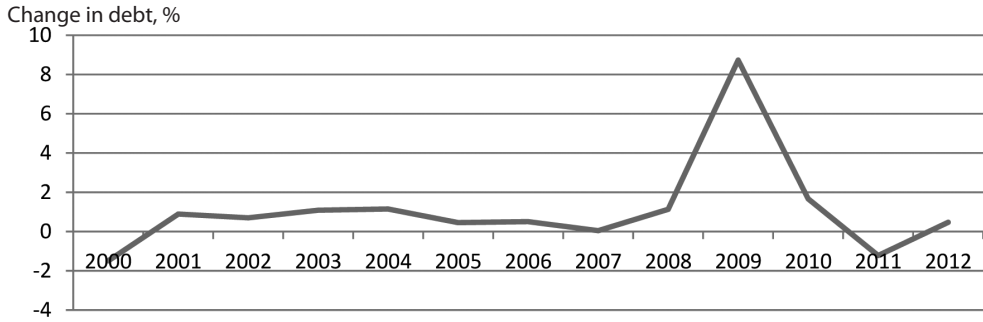


FIG. 5. Simulation of the change of the debt of Lithuania from year to year keeping budget deficit at 3%. Historical nominal GDP data were used

Source: Eurostat data, author's calculations.

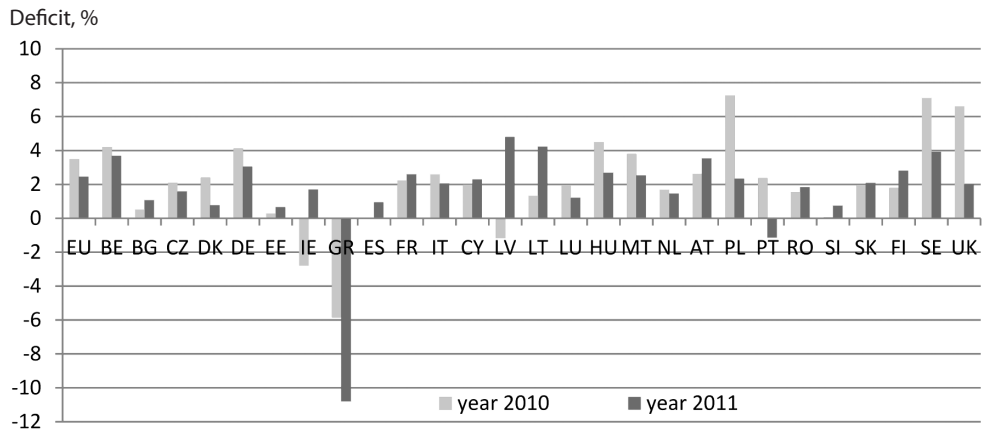


FIG. 6. The ceilings of the budget deficit for a non-increasing debt in the EU

Source: Eurostat data, author's calculations.

The steady state of the debt is achieved if the deficit is equal to $\bar{\mu}$. A marginal value of is calculated according to the formula

$$\bar{\mu} = b_0 \frac{(1 - e^{-\int_0^1 g(s) ds})}{\int_0^1 e^{-\int_x^1 g(s) ds} dx}$$

For the debt to be non-increasing during one year, the budget deficit μ should be less than or equal to $\bar{\mu}$. The nominal GDP growth in Lithuania was 3.5% and 11% in 2010 and 2011, respectively. Therefore, the ceiling of the deficit for a non-increasing debt was 1.3% in 2010 and 4.2% in 2011. Because of a slow GDP growth in 2010, Lithuania was in a position not to increase the debt just only in case of very tight budget constraints.

The year 2011 was an easier one because of a high GDP growth in Lithuania. Even in case of a deficit of 4.2%, the debt would remain stable.

In 2011, six countries – Belgium, Germany, Latvia, Lithuania, Austria, and Sweden – were in a position to decrease their debt even in case of violating the Maastricht criteria of 3% of the budget deficit. Belgium, Germany, and Austria had a significantly higher outstanding debt. Therefore, for these countries, the requirement to have a non-increasing debt, keeping the budget deficit at 3%, did not put strict limits for the nominal GDP growth. Lithuania, Latvia, and Sweden had a very strong nominal GDP growth in the euro terms in 2011, which implied more flexible requirements for the debt. Only two countries – Greece and Portugal – had no other way to stabilize their debt growth as to keep their budget in surplus. This is because their GDP growth rate was negative in 2011.

4. The ceiling for the primary deficit

The primary budget deficit is the budget deficit excluding interest payments on the debt. A country paying high interest on the debt is forced to keep a low primary deficit in order to have a steady state of the debt. Furthermore, the primary deficit has a direct impact on the long-term interest rate of the countries. Ardagna et al. (2004) have found that a one percentage point increase in the primary deficit related to the GDP increases contemporaneous long-term interest rates by about 10 basis points.

The interest rate on the debt varies from one country to another in the EU. The interest rates on the debt for new EU countries are presented in Table 1.

TABLE 1. The interest rates on the debt and S&P ratings of the new EU countries at the end of 2012

BG	CZ	EE	LV	LT	HU	PL	RO	SI	SK
4.7%	3.2%	1.6%	3.3%	4.8%	5.4%	5.0%	4.7%	3.9%	3.5%
BBB	AA-	AA-	BBB+	BBB	BB	A-	BB+	A	A

Source: Eurostat, author's calculations.

The interest rate on the debt of Lithuania was 4.8% in 2012. Only two countries in the EU – Hungary and Poland – pay a higher interest rate on the debt. These countries run an independent monetary policy; therefore, their local interest rate is traditionally higher. The high interest rate on the debt of Lithuania is related to a high yield of the bonds issued by Lithuania in 2009 and 2010.

A very low interest rate on the debt of Estonia is a result of an extremely low debt of the government. It is worth noting that the interest rate on the debt of Latvia is lower than the interest rate of some countries with higher credit ratings. The low interest rate on the debt of Latvia is related to the decision of the government to borrow from international

institutions during the debt crisis. Lithuania raised the funds in the market at extremely high interest rates during the turmoil in the market.

Instead of the relationship between the budget deficit and the government debt, now we will consider the relationship between the prime budget deficit and the government debt. In this case, the relationship depends on the interest rate on the debt and the GDP growth rate. We will use the model described by Kregždė, (2012). The amount of the debt at the moment t can be expressed in the following way:

$$b(t) = e^{\int_0^t (i(s) - g(s)) ds} [b_0 + \int_0^t d(x) e^{-\int_0^x (i(s) - g(s)) ds} dx], \quad (2)$$

where

i is an interest rate on the debt, continuously compounded,

g is the nominal GDP growth,

d is the primary deficit.

From formula (2) we arrive to the condition for the debt to be stable:

$$b(t) = e^{\int_0^t (i(s) - g(s)) ds} b_0 + \int_0^t d(x) e^{\int_x^t (i(s) - g(s)) ds} dx. \quad (3)$$

Let us take a period of one year and the primary deficit d as a constant during one year. Then, from the formula above, we have that the steady state of the debt is achieved if the primary deficit is equal to

$$\bar{d} = b_0 \frac{1 - e^{\int_0^1 (i(s) - g(s)) ds}}{\int_0^1 e^{\int_x^1 (i(s) - g(s)) ds} dx}.$$

For simplicity reasons, let us take the interest rate and the GDP growth non-changing during the year, i.e. $i(s) - g(s) = \bar{i} - \bar{g}$. Then the formula above has the following simple form:

$$\bar{d} = -b_0 (\bar{i} - \bar{g}).$$

The value of \bar{d} is a threshold for a non-increasing debt. We have an increasing debt for the value of the primary deficit d which is higher than \bar{d} , and we have a non-increasing debt for the value of the primary deficit d which is lower than \bar{d} .

From the equality (3) we have that the condition for the steady state of the debt depends on three parameters – d , I , and g . The difference $i - g$, expressing the difference between the interest rate on the debt and the nominal GDP growth rate, has a very specific impact on this inequality. The difference $(i - g)$ plays the role of the ‘snowball’ factor. Even if the primary deficit d is equal to zero, from formula (3) we have that the debt will increase for a positive $(i - g)$ value and will decrease for a negative $(i - g)$ value. A higher positive $(i - g)$ value implies a greater rate of increase of the debt. A negative $(i - g)$ value has a stabilising effect on the increase of the debt.

If $(i-g)$ is higher than zero, then the primary deficit d should be negative (primary budget balance should be in surplus) in order to secure a non-increasing debt. In case the value of $(i-g)$ is less than zero, it allows to have some primary deficit without increasing the debt. The importance of $(i-g)$ was emphasized by Izac (2009).

In case of $i = g$, a steady state of the debt is achieved if $d = 0$. This means that the primary deficit should be equal to zero. In other words, the payment of interest on the debt is compensated by the GDP growth, which implies a stable state of the debt. It is worth noting that the steady state of the debt for $i = g$ is valid for the primary deficit which is equal to 0, irrespective of the size of the initial debt. This is a unique case, because in other cases the steady state of the debt depends on the initial debt as well.

Ten-year averages of the differences of the interest paid on the debt and the GDP growth $(i-g)$ for the new EU countries from 2003 to 2012 are presented in Table 2.

TABLE 2. 10-year average of the difference $(i-g)$ for the new EU countries in 2003–2012

BG	CZ	EE	LV	LT	HU	PL	RO	SI	SK
-3.0%	-2.4%	-4.4%	-3.6%	-5.1%	1.6%	-2.1%	-4.8%	0.7%	-6.5%

Source: Eurostat, author's calculations.

Our calculation shows that most of the emerging EU countries have a negative value of $(i-g)$. This is a very big advantage of these countries. A high GDP growth rate allows to have the steady state of the debt and the primary deficit at the same time. Historically, the value of $(i-g)$ was very favourable for Lithuania. The only country – Slovakia – has a lower value of $(i-g)$.

From Table 1 we have that in order to have a negative $(i-g)$ in 2013, the nominal GDP growth of Lithuania should be greater than 4.8%; therefore, keeping a substantial negative value of $(i-g)$ becomes complicated. The interest rate payable on the debt is not volatile because the Modified Duration of the Lithuanian debt according to the Ministry of Finance (Lietuvos Respublikos Finansų Ministerija, 2012) at the end of 2011 was equal to 3.6%. Therefore, even in case of possible issues of new bonds with a lower interest rate, the interest rate on the portfolio of the debt will remain high. The interest rate issues in the domestic Lithuanian market have been discussed by Jasienė and Paškevičius (2009) and Lapinskas (2011).

The government has a very limited possibility to influence the variable g of the GDP growth. Therefore, we consider this variable g as an exogenous variable. The variable i depends on the government debt management policy and the overall risk of Lithuania.

Based on the Eurostat data of 2000–2012, we have made some statistical analysis of the data on the GDP growth rate and the interest rate on the debt. We have found that, on the average, the volatility of the interest rate on the debt in the EU is 5.1%, and this

is lower than the volatility of the GDP growth rate. The new EU countries have a higher volatility of the GDP growth and a volatility of the interest rate on the debt. Notably, the correlation between the interest rate on the debt and the GDP growth rate is positive for all the EU countries.

5. The burden of servicing the debt

The limit for the budget deficit is set in the Maastricht criteria in terms of the total budget deficit. A big government debt and a high interest on the debt force the government to reduce the primary budget deficit in order to keep the total budget deficit within the limits. This is very painful for the government, because it has to reduce social and other expenses.

It is very important to note that expenses on servicing the debt, depending on the outstanding amount of the debt and the interest rate on the debt, cannot be reduced immediately. The debt can be reduced by keeping high requirements for the budget balance. In addition, the GDP growth should be strong. The volatility of the interest rate on the debt depends on the Modified Duration of the debt, which is part of the debt management policy and credit risk premium of the country. A high Modified Duration reduces refinancing the risk of the debt, but at the same time it fixes the interest rate for a longer period. Lithuania, whose Modified Duration of the debt is relatively long, has fixed a high interest rate on the debt, which was set in 2009 and 2010 for quite a long period.

The ratios of the interest paid on the debt to the GDP at the end of 2012 for the new EU countries are presented in Fig. 7.

The Lithuanian ratio of the interest paid on the debt to the GDP was equal to 1.93% at the end of 2012. Therefore, we have that the limit of the total budget deficit of 3% is equivalent to the limit of 1.07% for the primary budget deficit. It is worth noting that Hungary should run the primary budget in surplus in order to be within the limits set by the Maastricht criteria. The equivalent ratio in the EU-27 is equal to 2.9%.

Another important indicator is the share of the government revenues spent for the interest paid on the debt. The ratio of the interest paid on the debt to the total general government revenues⁹ (government revenue) for Lithuania and Latvia is presented in Fig. 8.

This ratio shows the burden of the interest paid on the debt to the countries' finance. As we see in Fig. 8, the burden of the debt of Lithuania varies from 2% to almost 6% of the government revenues. Currently, it stands at 5.9% of the government revenues. This ratio in Latvia and Estonia is 3.9% and 0.4%, respectively. The ratio is still increasing in 2012, contrary to the Latvian case where the burden of servicing the debt has stabilised from 2009 and has a decreasing trend.

⁹ The total general government revenue is defined according to the Commission Regulation (EC) No. 1500/2000 of 10 July 2000 on the general government expenditure and revenue.

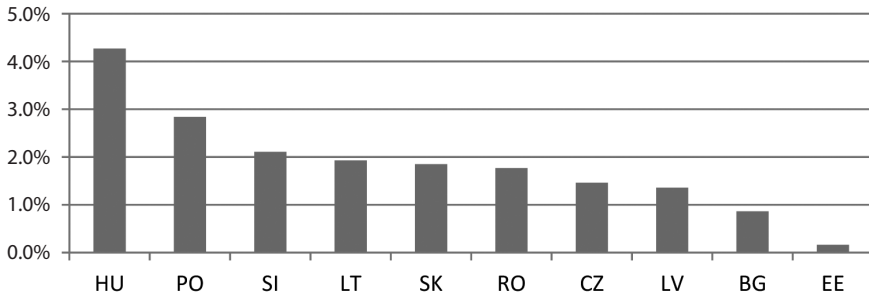


FIG.7. The ratio of interest paid on the debt to GDP at the end of 2012

Source: Eurostat, author's calculations.

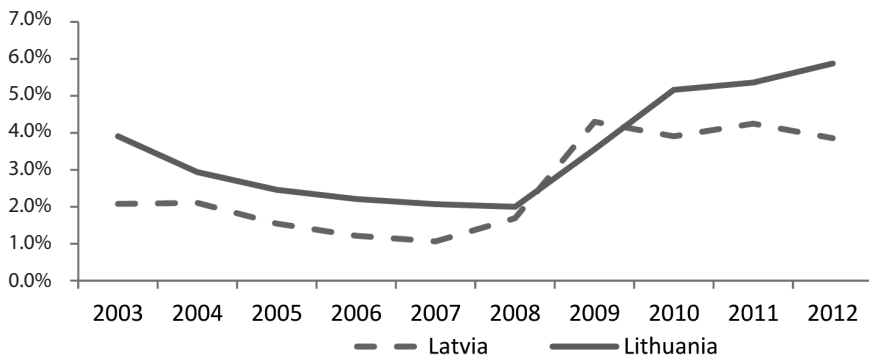


FIG. 8. The ratio of the interest paid on the debt to government revenues for Lithuania and Latvia

Source: Eurostat, authors calculations.

The fact that the burden of interest paid on the debt has increased 1.5 times in Lithuania from 2004 is worrying.

6. Conclusions

There is no way to set a constant limit which is independent of other factors, for the countries' budget deficit ensuring a non-increasing relative debt. Even in case of the budget surplus, the debt to the GDP ratio can increase in case of a negative GDP growth. The deficit of the budget of 3% affects the debt of the country very differently. A further appreciation or depreciation of the debt, when having a fixed budget deficit, depends on two main parameters: the nominal GDP growth and the initial stock of the debt. When keeping the budget deficit at 3%, the amount of the debt of the country increases over time for countries with a small initial outstanding debt and decreases for countries with a big initial outstanding debt, the GDP growth being 5%. The GDP growth rate has an

opposite effect. Countries with a high GDP growth rate are in a very comfortable position, because the GDP growth rate has pushed their debt down.

Simulation of the development of the debt of Lithuania during the period 2000–2012, by using statistical data on the GDP growth, revealed that the debt would increase each year in case of the budget deficit of 3%. An exception was the year 2011. Therefore, for Lithuania, which had a very small initial debt in 2000, the budget deficit of 3% opened the door for increasing the debt.

The difference between the GDP growth rate and the interest rate on the debt plays the role of a “snowball” factor. For the countries with a strong GDP growth rate and a low interest rate on the debt, the “snowball” effect has a positive impact on the development of the debt over time, even in case of some primary deficit. The Lithuanian interest rate on the debt was equal to 4.8% at the end of 2012. This index is one of the highest in the EU. In order to have a decreasing debt over time even in case of some primary deficit, the nominal GDP growth should be higher than 4.8%.

In 2000–2008, Lithuania had a very low debt and a strong GDP growth. The strong GDP growth played a positive role for the debt stabilization, but, because of a low initial debt, the budget deficit of 3% implied the further growth of the debt. After 2000, the debt of Lithuania increased to almost 41% of the GDP. Currently, the budget deficit of 3% ensures the convergence of the Lithuanian debt to 60%, but not the steady state of the debt.

The ceiling of the budget deficit of 3% can be used as a guideline but not a benchmark for the governments managing the countries’ finance. In order to avoid an increase of the debt in the future, other aspects such as the GDP growth and the outstanding stock of the debt should be taken into account, setting appropriate budget constraints. An appropriate simulation of the development of the debt in various future scenarios should be a common rule for the budget balance of Lithuania.

The main conclusion is that, in general, the ceiling of 3% is too high for Lithuania. In order to stabilise the increase of the debt, Lithuania should keep a lower budget deficit which should be less than 2.4% in 2013, and this index should be very flexible from year to year. The high current interest rate on the debt puts an additional pressure on the primary deficit.

REFERENCES

- Ardagna, S., Caselli, F., Lane T. (2004). Fiscal discipline and the cost of public debt Service: Some estimates for OECD countries. Working Paper Series, No. 10788, NBER, September 2004.
- Baum, A., Checherita-Westphal, C., Rother, P. (2012). Debt and growth: new evidence for the euro area. ECB Working Paper. No. 1450.
- Blanchard, O., Chouraqui, J.C., Hagemann, R.P., Sartor, N. (1990). The sustainability of fiscal policy: New answers to an old question. OECD Economic Studies, No. 15.

- Buti, M., Eijffinger, S., Franco, D. (2003). Revisiting the Stability and Growth Pact: grand design or internal adjustment? *European Economy – Economic Papers*, No 180, European Commission, January.
- Checherita-Westphal, C.; Rother, Ph. (2012). The impact of high government debt on economic growth and its channels: An empirical investigation for the euro area. *European Economics Review*, Vol. 56, p. 1392–1405.
- Cuestas, J.C., Steahr, K. (2011). Fiscal shocks and budget balance persistence in the EU countries from Central and Eastern Europe. The University of Sheffield, Department of Economics, Working Papers, No 014.
- Governatori, M., Eijffinger, S. (2004). Fiscal and monetary interaction: The role of asymmetries of the stability and growth. Pact in EMU 2004. CESIFO Working Paper No 1354.
- European Central Bank (2011). Ensuring fiscal sustainability in the euro area. *Monthly Bulletin*, ECB, Frankfurt-am-Main, April 2011.
- European Commission. (2012). European economic forecast. *European Economy*, 7/2012.
- European Commission (2011). Debt sustainability in the EU. *European Economy*, 3/2011.
- European Commission (2013). Eurostat. Statistics Databases. Retrieved April 29, 2013, from <http://appsso.eurostat.ec.europa.eu/nui/submitViewTableAction.do>
- International Monetary Fund (2011). Modernizing the framework for fiscal policy and public debt sustainability analysis. IMF, August.
- Izák, V. (2009). Primary balance, public debt, and fiscal variables in post-socialist members of the European Union. *Prague Economic Papers*, 2, p. 114–130.
- Hauptmeier, S., Sanchez-Fuentes, A.J., Schuknecht, L. (2011). Towards expenditure rules and fiscal sanity in the euro area. *Journal of Policy Modelling*, Vol. 3, issue 4, July–August.
- Holm-Hadulla, F., Hauptmeier, S., Rother, P. (2011). The impact of numerical expenditure rules on budgetary discipline over the cycle. *Applied Economics*, Taylor and Francis Journals, Vol. 44(25), p. 3287–3296.
- Fischer, J., Jonung, L., Larch, M. (2006). 101 proposals to reform the Stability and Growth Pact. Why so many? A Survey, *European Economy – Economic Papers*, No 267, European Commission, December.
- Jasienė, M., Paškevičius, A. (2009). Interrelation of the money and capital markets. *Ekonomika*, Vol. 88, p. 66–82.
- Kregždė, A. (2012). Government debt sustainability: The Lithuanian case. *Ekonomika*, Vol. 91(3), p. 58–74.
- Kumar, M., Woo, J. (2010). Public debt and growth. IMF Working Paper 10/174.
- Lapinskas, V. (2011). The VILIBOR-EURIBOR spread dynamics during the recent financial crisis. *Ekonomika*, Vol 90(4), p. 100–115.
- Lietuvos Respublikos Finansų Ministerija (2012). Valstybės skola.
- Mendoza, E. G., Ostry, J. D. (2008). International evidence on fiscal solvency: Is fiscal policy responsible? *Journal of Monetary Economics*, Vol. 55, p. 1081-1093.
- Morris, R., Ongena, H., Scuknecht, L. (2006). The reform and implementation of the stability and growth pact. ECB Occasional Paper Series, June 2006, No 047.
- Polito, V., Wickens, M. (2012). A model-based indicator of the fiscal stance. *European Economic Review*, Vol. 56 .p. 526–551.
- Reinhart, C. M., Rogoff, K.S. (2010). Growth in a time of debt, NBER, Working Paper.
- Saraceno, F., Monperrus-Veroni, P. (2004). A simple proposal for a debt-sensitive stability pact. *Vierteljahrshefte zur Wirtschaftsforschung. Quarterly Journal of Economic Research*, Vol. 73(3), p. 471–80.
- Wyplosz, C. (2007). Debt sustainability assessment: The IMF approach and alternatives. HEI Working Paper No 03/2007.