



Debt Sustainability Issues in Central and Eastern European Countries*

* Published in *Eastern European Economics*, 2018, 56(5), 438-470.

Bettina Bökemeier

Bielefeld University, Department of Business, Administration and Economics, Post-Doc Researcher

Her research interests are in fiscal policy and public finance (particular public debt) and economic growth, as well as economics of Central and Eastern Europe

Andreea Stoian

Faculty of Finance and Banking and CEFIMO, Bucharest University of Economic Studies, Professor of Finance, PhD

Her research interests are in fiscal policy, particular sustainability and vulnerability, financial markets and Central and Eastern European countries economies.

Even if many of the CEE countries have not been exposed to significant fiscal sustainability problems, they should maintain prudent policies in order to be prepared for a worsening of economic conditions or a future crisis.

Summary

This study investigates debt sustainability in ten Central and East European countries over the period 1998–2015. We calculate the stabilized debt ratios, turning points, and debt limits using estimates of a fiscal reaction function, capturing the response of the government to changes in their debt ratio. We find that in 2017, the public debt exceeded the stabilized debt ratio values in all the countries under investigation. However, the public debt still has a stable dynamic and is far from the level at which governments' fiscal reaction reverses and becomes negative. After this level, public debt will have an unstable trajectory and will become unsustainable. Moreover, governments are still far from the debt thresholds of "fiscal fatigue", a situation in which the effort to stabilize debt (in terms of adjustment in fiscal policy) exceeds the government's ability or willingness to do so.

Introduction

Debt sustainability became a central part of the economic policy debate after the sovereign debt crisis in Europe in 2009. Since then, interest in fiscal policy has increased among international organizations such as the European Commission and the International Monetary Fund (IMF). They develop policy frameworks and recommendations that aim to reduce high debt ratios or keep budget deficits under control. These problems concern not only the large West European economies and countries such as Greece, but also Central and East European countries. But, only a few studies on fiscal sustainability cover Central and East European (CEE) countries (i.e., Redžepagić and Llorca, 2007; Stoian and Câmpeanu, 2010; Eller and Urvová, 2012; Krajewski et al., 2016).

Considering the framework of fiscal policy in these countries and the state of the art in the economics literature on sustainability, the question that naturally arises is whether public debt in CEE countries is sustainable. The goal of our study is to examine the sustainability of public debt in ten CEE countries. We make two contributions to the literature. On one hand, we extend Burger's methodology of calculating stabilized debt ratios, taking into consideration that governments' fiscal reaction is not always linear and it can be modeled using polynomial function, which indicates that the response varies over time. On the other hand, we calculate the country-specific stabilized debt ratios, turning points, and debt limits to examine the effect of "fiscal fatigue" on this group of countries. The stabilized ratio corresponds to the steady-state debt level, and indicates the level to

Governments are still far from the debt thresholds of "fiscal fatigue."

which public debt should converge on long-term given government's past fiscal response. In the case of a non-linear fiscal response, the turning point represents that debt level at which governments' reaction changes. The debt limit represents the debt level at which government effective response lies below the theoretical response and indicates the fiscal fatigue phenomenon. In this way, we can shed more light on debt sustainability in emerging economies in this region of Europe. The characteristics of these countries that might affect long-term sustainability also led our research.

In order to provide a relevant answer to this research question, we develop a methodology first employed by Burger (2012), Burger et al. (2011), Burger and Marinkov (2012), and Fincke (2012), which consists of calculation of a stabilized debt ratio using the estimated coefficients of a fiscal reaction function. Using annual data from 1998 to 2015, we apply this methodology to a panel model with fixed effects in ten CEE countries: Bulgaria, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, and Slovenia.

The main text

Regarding the government's budget, tax policy and spending decisions are the key instruments to fiscal policy design. It is determined by the primary balance that is the difference in primary spending (excluding interest payments) and public (tax) revenues. Moreover, it can be interpreted as the central instrument to achieve a stabilized debt ratio. Such a primary balance for realizing a stabilized debt ratio is further shaped by the difference in the interest rate and growth rate interval. Additionally, a formative approach to studying debt sustainability was introduced by Bohn (1998): the fiscal response mechanism, which analyzes how the government reacts to changes in the public debt ratio in its primary balance relative to GDP. If it runs surpluses (or, more generally, enhances its balance) as the debt ratio rises, it indicates sustainable behavior. Combining these two approaches allows to study the stabilized debt value for each economy, which is determined by the individual economy's past fiscal behavior and shaped by the difference in the interest rate and growth rate interval.

However, this approach does not come without problems. It suggests that public debt could increase infinitely without any limit and that the fiscal response is strong at any debt level and the linear fiscal response implies that financial markets will permanently want to lend money to governments. Ostry et al. (2010) consider this approach unrealistic as long as, at a certain debt ratio, the primary surplus should be as large as a country's GDP and raised the issue that the relationship between the primary balance and public debt varies with the level of debt.

Many studies empirically prove the existence of a nonlinear relationship between the primary balance and public debt indicating that the response of the primary surplus weakens as the debt-to-GDP ratio rises and that it eventually peters out. Ghosh et al. (2013) introduce the hypothesis of "fiscal fatigue" in advanced economies. The authors promote the existence of a debt limit, which, once exceeded, leads governments to default. So, considering this idea and if the empirical evidence shows that the fiscal response is a nonlinear one, we can determine the turning points and the debt limits at which the effect of fiscal fatigue occurs.

Technically, we analyze the empirical evidence of polynomial fiscal reaction functions and estimate three models, corresponding to the linear, quadratic, and cubic fiscal responses by using instrumental variables (IV) and the limited information maximum likelihood (LIML) estimator with country-specific characteristics for a data set of the ten CEECs over the years 1998–2015. We include several macroeconomic control variables in the estimations such as government expenditure fluctuation, inflation or an accession / Euro effect.

The results indicate that CEE governments' response to changes in the debt ratio can be modeled in both linear and cubic form, which is quite intriguing. We know that CEE countries have not reached yet very high public debt or comparable to those of the advanced economies, except Hungary and Slovenia. That is probably why governments react positively to increase in public debt and the response is still a

linear one. However, the cubic model is more sensitive and it shows how the fiscal reaction will change relative to the level of public debt. We found out that for small values of public debt, the reaction is a negative one compared to the positive one indicated by the linear model. If the debt exceeds a certain level (turning point), the reaction becomes positive. This suggests that the government believes that a higher debt may endanger its long-term sustainability and, consequently, it will change its behavior. It will strive to increase the primary balance if the public debt increases significantly. If the debt level exceeds a second turning point, its reaction reverses to the negative one and peters out. This is because a positive reaction leading to an increase in the primary balance would require harsh fiscal adjustments whose economic and social costs would not be desired or accepted by governments.

To estimate the stabilized debt ratios for CEE countries, we use the cubic fiscal response because we believe that governments should be aware that choosing a strategy to allow unlimited public debt growth is not prudent in the long run.

We could not calculate the stabilized debt ratios for Bulgaria, Estonia, Lithuania, and Poland because the individual intercepts were not significant. The first value of the stabilized debt ratio is negative and, therefore, negligible. Table 1 reports the stabilized debt ratios, the turning points and the debt limits which are relevant. The stabilized debt ratio indicates the debt ratio to which public debt should converge, and it varies from the smallest of 16 percent of GDP in Latvia and Romania to the highest of 41 percent of GDP in Hungary.

Table 1 The stabilized debt ratio, the turning point and the debt limit

Country	Stabilized debt ratio (% GDP)	Turning point (% GDP)	Debt limit (% GDP)
The Czech Republic	24.67	105.64	153.80
Hungary	41.14	104.45	146.61
Latvia	16.60	89.80	132.20
Romania	16.73	106.87	160.60
Slovakia	29.65	88.02	127.20
Slovenia	21.72	78.33	112.82

It indicates the steady-state level to which the public debt should converge in the long run given the past fiscal government behavior and response. The turning point shows the debt level at which the fiscal reaction turns from positive to negative. We can see that government response changes at high levels of public debt. This means that at this time fiscal response to changes in the public debt in CEE countries is a positive one. Regarding the turning points, the outcomes indicate that the first turning point is negative, except Slovenia, for which we found a threshold of 0.75 percent of GDP, which is close to zero. These results indicate that the fiscal response in CEE countries is negative for very low or negative debt ratios. The second turning point, which is reported in Table 1, indicates the change in the fiscal response from positive to negative. It also represents a second steady-state debt level that once it is exceeded, the public debt will explode and will have an unstable and unsustainable dynamics.

For a deeper analysis, we compare the public debt ratio in 2017 with the calculated stabilized debt ratios and the turning points. For all CEE countries for which we calculated the stabilized debt ratios, the debt ratio in 2017 exceeded the stabilized debt ratio and was below the debt

limit - this indicates that the dynamic of public debt is stable. If governments continue to react according to the estimated fiscal response, then, for any value of public debt within this range, sustainability will be ensured. However, we found for Slovenia's case that the public debt-to-GDP ratio in 2017 was close to the threshold of the second turning point. At a maximum 5 percent of GDP increase in the debt ratio, the fiscal response will turn negative, and the primary surplus will decrease. In this case, the government should be cautious, even if it still has room for maneuver up to the debt limit where fiscal fatigue occurs.

In the aftermath of the crisis, several changes of the macroeconomic and financial conditions occurred. Low GDP growth rates are among the most important factors and affect the interest-growth rate differential. Applying the same methodology as before, we calculate the new stabilized debt ratios by considering the three-year interest-growth rate differential over the period 2016-2018 and we conduct a comparison with the public debt-to-GDP ratio in 2017. The most notable changes occur in Romania and Slovenia. Romania has the greatest increase in the differential among the countries in this group. The results suggest a narrowing of fiscal space for maneuver by the Romanian government. In Slovenia, the interest-growth rate differential changed from positive to negative, and the new calculations indicate a decrease in the stabilized debt ratio and an increase in the debt limit. In this case, the room for maneuver has widened. Slovenia can take

advantage of this situation, given that in the positive situation, it was too close to the second turning point.

CEE governments' response to changes in the debt ratio can be modeled in both linear and cubic form

Finally, we examine the ability of CEE governments to stabilize public debt. Thus, we calculate the primary surplus needed to stabilize public debt at the ratio over a specific number of periods considering the initial debt ratio and the interest-growth rate differential conditions. Except in Latvia and Romania, all the other countries could stabilize their public debt in 2018. The projected primary surplus is higher than required. Table 2 reports summarizes the results.

Table 2 The stabilizing primary surplus (ps^*) vs. the effective primary surplus (ps)

Country	ps^* (% GDP)	ps (% GDP)
The Czech Republic	-0.20	2.1
Hungary	-0.64	0.1
Latvia	-0.23	-0.3
Romania	-0.3	-2.0
Slovakia	-0.24	0.4
Slovenia	-0.50	2.5

Conclusions and Policy Implications

We used different interest–growth rate differentials to calculate the stabilized debt ratio, the debt limits, and the turning points. Comparing these debt thresholds with the public debt-to-GDP ratio in 2017, we found that the current public debt exceeded the calculated stabilized debt ratio, but it had stable dynamics because it was lower than the debt limit. We also examine the ability of governments to stabilize public debt in 2018. The results showed that, except Latvia and Romania, all the countries could stabilize their debt in 2018.

Regarding policy recommendations, our results do not directly suggest serious debt sustainability issues in the CEE countries as their current debt ratio is below the debt limit and the response of the primary balance turns out to be higher than the one required. However, it should be kept in mind that these results only state the current situation and whether it stays this way subsequently relies on the governments' fiscal

decisions. For instance, the calculations for possible stabilization in 2018 show that some countries may find it difficult to implement the necessary adjustments. Thus, even if many of the CEE countries currently are not directly exposed to fiscal sustainability problems, they should still maintain prudent fiscal policies in order to be prepared for a worsening of economic conditions or a future crisis. Due to low indebtedness rates and a negative differential between the interest rate on public debt and the GDP growth rate, these countries may fall in the debt trap. This means that governments will be tempted to use public debt as fiscal insurance and absorb the shocks in the economy by increasing it. The danger arises when, as a consequence of an economic crisis, the GDP growth rate decreases and the interest rate differential becomes positive. In such a case, the accumulated public debt can suddenly become a big and unsustainable burden.

References:

1. Bohn, H. 1998. *The behavior of U.S. public debt and deficits*. Quarterly Journal of Economics 113 (3): 949-963.
2. Burger, P. 2012. *Fiscal Sustainability and Fiscal Reaction Functions in the US and UK*. International Business of Economics Research Journal 11 (8): 935-942.
3. Burger, P. ; Marinkov, M. 2012. *Fiscal rules and regime-dependent fiscal reaction functions: the South African Case*. OECD Journal on Budgeting 12 (1): 1-29.
4. Burger, P.; Stuart, I.; Jooste, C.; Cuevas, A. 2011. *Fiscal sustainability and the fiscal reaction function for South Africa*. IMF Working Paper WO/11/69, International Monetary Fund, Washington DC.
5. Eller, M.; Urvová, J. 2012. *How Sustainable Are Public Debt Levels in Emerging Europe? Evidence for Selected CESEE Countries from a Stochastic Debt Sustainability Analysis*. Focus on European Economic Integration Q4/12, 48-79.

INFER Policy Brief Series

Volume 2, Issue 3, November, 2019



6. Fincke, B. 2012. *Sustainable Debt Ratios: How should 'stabilized values' look like*. CEMM Working Paper No. 161, Universität Bielefeld, Fakultät für Wirtschaftswissenschaften, Bielefeld, Germany.

7. Ghosh, A.R. ; Kim, J.I. ; Mendoza, E.G. ; Ostry, J.D. ; Qureshi, M.S. 2013. *Fiscal Fatigue, Fiscal Space and Debt Sustainability in Advanced Economies*. Economic Journal, Royal Economic Society, vol. 0, F4-F30, 02.

8. Krajewski, P.; Mackiewicz, M.; Szymańska, A. 2016. *Fiscal Sustainability in Central and Eastern European Countries – A Post-Crisis Assessment*. Prague Economic Papers, 25(2), 175-188.

9. Ostry, J.; Ghosh, A.R.; Kim, J.I.; Quareshi, M.S. 2010. *Fiscal Space*. IMF Staff Position Note, SPN/10/11

10. Redžepagić, S.; Llorca, M. 2007. *Does Politics Matter in the Conduct of Fiscal Policy? Political Determinants of the Fiscal Sustainability: Evidence from Seven Individual Central and Eastern European Countries (CEEC)*. Panoeconomicus, 54 (4), 489-500.

11. Stoian, A.; Câmpeanu, E. 2010. *Fiscal Policy Reaction in the Short Term for Assessing Fiscal Sustainability in the Long Run in Central and Eastern European Countries*. Czech Journal of Economics and Finance, 60 (6), 501-518.