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Abstract

The aim of this paper is to investigate public finance sustainability for a selected group of ten Central and Eastern European countries. In order to assess the fiscal sustainability of these countries we extend standard analyses typically used for developed countries to our group of ten CEE countries. To assess fiscal sustainability we use panel stationarity and cointegration tests, as well as estimates of certain parameters of fiscal reaction functions. Our research shows that despite the financial turmoil, CEE countries demonstrate the existence of a long-term relationship between revenues and expenditures and they have statistically relevant parameters of the fiscal reaction function. This indicates that the public finances in CEE countries are sustainable despite the crisis. However, the analysed group of countries shows sustainability only in a weak sense, which may pose a threat to public finances in the future.

Keywords: fiscal sustainability, public debt, public finances, fiscal policy, CEE countries

JEL Classification: E62

1. Introduction

The recent financial crisis showed that the merging economies of Central and Eastern European countries (CEE countries) were particularly prone to overall economic risk in cases of international turmoil. It demonstrated that confidence from foreign investors faded rapidly at the sight of any potential problems. Indeed, irresponsible fiscal policy is perceived as a major threat to undermine trust in the CEE countries on international markets. Fiscal sustainability is one of the most important considerations for creditors whether to resume lending (Guillen, 2010).

Since the recent financial crisis was an economic shock with a considerable adverse fiscal component, it presented a challenge for every country to keep sound public finances. It is hence important to check whether CEE countries were able to achieve and retain sustainability both before and during the crisis years. We use a number of statistical tests to assess whether fiscal policy in these countries conformed to the intertemporal budget constraints of their public sectors.

This paper is structured as follows. The following Section 2 presents a brief survey of the literature on existing methods for investigating public finance sustainability. It presents both standard tests for individual countries and modern approaches based

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on panel methodology. Section 3 shows the main results of our investigation of sustainability in the analysed group of countries. It shows the results of the integration analyses, cointegration analyses, as well as the methodology based on fiscal reaction function. Section 4 summarizes the conclusions drawn.

2. Methodology

2.1 Individual unit root analysis

The first step in analysis of fiscal sustainability is based on the use of standard unit root tests. Tests that are well known in the literature and commonly used in practice include among others the Augmented Dickey-Fuller test, the Phillips-Perron test (1988), the Kwiatkowski, Phillips, Schmidt and Shin test (1992), the Elliott, Rothenberg and Stock Point Optimal test (1996), as well as the Ng and Perron test (2001). A lack of stationarity of time series for public debt may be treated as a lack of fiscal sustainability for a given country. However, we should point out that stationarity of public debt is not a necessary, but only a sufficient condition in assessment of fiscal sustainability.

Analyses based on the individual tests mentioned above, however, can be inaccurate. In their construction we assume the absence of structural breaks, which can affect the stationarity properties of time series. Hence, in practice, methods that explicitly allow for structural breaks are often implemented (Afonso, Rault, 2007). The most popular endogenous unit root tests are the Zivot and Andrews (1992) and Lumsdaine and Papell (1997) tests. The first allows only to test a unit root in terms of one structural break. The test is based on a regression equation with the assumption of two types of dummy variables. The variables are related to the mean shift occurring at each possible break-date and the shift occurring at trend. The null hypothesis of the test implies that the time series under consideration contains a unit root with a drift without any structural break. Indeed, an alternative hypothesis of the test implies that analysed time series generates a trend-stationary process with one time break that occurs at an unknown time.

The Zivot and Andrews (1992) test was further expanded by Lumsdaine and Papell (1997) to include two structural breaks in the series. The test is based on a similar but extended regression equation of C version of the sequential trend break model by Zivot and Andrews (1992). If the null hypothesis of the Lumsdaine and Papell test is rejected, this means that the analysed time series is interpreted as a broken trend stationary with two breaks. As Afonso and Rault (2007) emphasize, this extension of the C model of Zivot and Andrews (1992) – also called model CC - allows for breaks related to the intercept and slope of the trend in the regression equation.

2.2 Panel tests of sustainability

As shown by Hakkio and Rush (1991), Quintos (1995) and Ahmed and Rogers (1995), the stationarity analyses in the past were mostly performed for individual countries, resulting in the problem of short time series. Since for many countries available time series are short, unit root tests are often unable to reject the null hypothesis of no stationarity simply because the actual mean-reverting behaviour is slow and takes several years to complete. Recent literature deals with the cross-sectional analysis of fiscal sustainability by applying panel data methods. The main advantage of panel unit root tests and panel

cointegration analysis is that they increase the power of these tests by including new observations by individual time series to the panel (Afonso, Rault, 2007). In recent years methods based on panel data are more commonly used to assess fiscal sustainability. Modern panel analyses of cointegration and stationarity have been implemented, for instance, by Afonso and Rault (2007, 2008), Prohl and Schneider (2006), Westerlund and Prohl (2010) and Afonso and Jalles (2012).

Afonso and Rault (2007) emphasize that the common panel methods of testing integration are (i) first generation panel unit root tests, that assume cross-country independence among panel units except for common time effects (Breitung, 2000; Hadri, 2000; Levin, Lin, Chu, 2002; Im, Pesaran, Shin, 2003), (ii) second generation panel unit root tests allowing for cross-country dependence, by Moon and Perron (2004), Choi (2006), (iii) panel unit root test allowing for structural breaks (Im, Lee, 2001) based on the Lagrange multiplier.

Popular first generation panel unit root test is the procedure proposed by Im, Pesaran and Shin (2003). This test is based on several key assumptions, including the presence of a heterogenous serial correlation structure of the error term, heterogeneity in the form of individual deterministic effects and, as was mentioned above, assumption of cross-sectional independence among panel units with the exception of common time effects. As was pointed out by O'Connell (1998), Lyhagen (2000) and Banerjee, Marcellino and Osbat (2005) the first generation panel unit root tests suffer from weak economic usefulness. These tests face the problem of strong distortions when panel units are cross-correlated or cross-sectionally cointegrated under the assumption of cross-sectional dependence only in relation to common time effects. Moreover, under rejection of the null, an alternative hypothesis may occur as a certain mix of stationarity and non-stationarity processes of the series.

Time series may be cross-correlated. The panel model application of cross-sectional dependence is now developing in the modern literature. The most common tests, testing the sustainability of public finances under conditions of cross-sectional dependence, are those proposed by Phillips and Sul (2003), Bai and Ng (2004), Smith, Leybourne and Kim (2004), Moon and Perron (2004), Choi (2006), and Pesaran (2007).

If structural breaks occur in a time series, the mentioned panel tests significantly lose their power. One attempt to avoid this situation has been to use panel unit root tests allowing for structural breaks. As Afonso and Rault (2007) show in their article, combining structural breaks with panel data allows to significantly increase the power of the unit root tests.

In order to limit problems with panel stationarity analysis, traditional panel unit root tests may be supplemented by the SURADF (Seemingly Unrelated Regression ADF) test proposed by Breuer, McNown and Wallace (2002, 2006). The test statistic is computed individually as a t-statistic for coefficient of the lagged level. More details are presented in Afonso and Rault (2008), which is the first empirical application of SURADF panel integration analysis for assessment of the sustainability of public finances in the EU.

Panel methods, while better from a purely econometric point of view, suffer from the obvious issue of the problematic definition of the entity that is being considered. Empirical conclusions stemming from the analysis of a heterogeneous group of countries are vague and often have little economic content. However, the panel approach is much more justified when applied to the group of emerging CEE countries. These economies are often gathered in one portfolio by financial investors. Moreover, CEE countries share a considerable array of institutional and social characteristics as a result of their geographical proximity and shared history. From this point of view, performing a group

analysis of the whole panel is economically insightful, since any fiscal irresponsibility by one country has a strong adverse effect on the financial stability of other countries within this group. From this standpoint, one can define the “group fiscal sustainability” as a characteristic present when all the member countries of the group follow fiscal policies that conform to the intertemporal budget constraints of their public sectors.

2.3 Cointegration of fiscal variables

In terms of fiscal sustainability, the cointegration analysis allows for testing the existence of a structural relationship between government expenditures and revenues in the long term. This procedure is a further step in testing sustainability, typically following after confirmation of non-stationarity of an analysed time series. Although the stationarity of public debt is treated as only a sufficient condition for the existence of public finance sustainability, the cointegration relationship between government expenditures and revenues is regarded as a necessary condition for sustainability. The cointegration analysis is based on an intertemporal budget constraint equation excluding Ponzi game conditions, and under the assumption that government revenues and expenditures are non-stationary variables and $I(1)$.

The cointegration analysis has been widely expanded in terms of panel models. Most panel cointegration tests are residual-based approaches dealing with homogenous and heterogenous alternatives. According to Afonso and Rault (2007), these tests deal with the problem of spurious regression that may be observed in a panel model when variables are $I(1)$. The residual-based tests, in terms of the existence of inter-group cointegration in a panel, are expanded in the literature by, among others, Pedroni (1999, 2001), Larsson, Lyhagen and Löthgren (2001) and Westerlund (2005, 2008). Under special circumstances, referring to the possible existence of cross-sectional dependence between time series, it is possible to generate data-specific critical values by implementing the bootstrap distribution of Pedroni’s test statistic. Pedroni’s test requires an assumption about cross-sectional independence across individual panel units, except for common time effects. Pedroni’s (1999, 2004) panel data cointegration test was generalized by Banerjee and Carrion-i-Silvestre’s (2006) extension with the null hypothesis of joint non-cointegration. This bootstrap test is proposed by Westerlund and Edgerton (2007). The null hypothesis of this test is related to the existence of cointegration between general government revenues and expenditures against the alternative hypothesis that in the panel there is at least one country for which these two series are not cointegrated. Contrary to the panel data cointegration test of Pedroni (1999, 2004), the Westerlund and Edgerton (2007) procedure is based on a null hypothesis of cointegration. If its hypothesis is not rejected, this implies a long-term relation for all panel countries.

2.4 Fiscal reaction function

Another method of assessing fiscal sustainability is estimation of the so-called fiscal reaction function. The fiscal reaction function is a behavioural equation that describes the behaviour of the fiscal variable of interest given the current fiscal, macroeconomic and political conditions.

It should be kept in mind that the methods mentioned above (based on cointegration and integration analyses) rely on a special intertemporal budget constraint. As Bohn (2005, 2007) argues, analyses based on cointegration between fiscal variables may be a weak

approach in testing fiscal sustainability. Alternatively, he proposes using the so-called fiscal reaction function and testing the statistical relevance of parameter ρ , showing the relation between a primary budget surplus (s_t) and public debt (b_t) (both as a ratio of GDP). The simple reaction function is as follows:

$$s_t = \alpha_0 + \rho b_t + \varepsilon_t \quad (1)$$

To maintain fiscal sustainability, a positive value of ρ is of crucial importance. Henning Bohn in series of papers (Bohn, 1998, 2005, 2007) shows formally that positive ρ is a sufficient, albeit not necessary condition for fiscal solvency. The statistical significance of ρ may be tested using the critical values of ADF distribution and t-distribution. As pointed out by Mackiewicz (2010), the test based on the ADF distribution has a lower testing power than the test based on t distribution, but both approaches are quite good methods for testing fiscal sustainability.

The assessment of fiscal sustainability and the soundness of public finances *via* the fiscal reaction function approach is widely popularized. For example, the fiscal reaction function was widely used by Jayawickrama, Abeyasinghe (2006) for testing the sustainability of U.S. public finances; by Ballabriga, Martinez-Mongay (2005) for testing EU public finances; by Claeys (2006), Giannitsarou, Scott (2006), Mendoza, Ostry (2007) for testing a panel of OECD countries; by Greiner, Koeller, Semmler (2006) for examining fiscal stability in Germany; and by Haber, Neck (2006) for testing the soundness of Austrian public finances.

3. Empirical Analysis

3.1 Fiscal data

For the purpose of testing fiscal sustainability in the selected CEE countries we used the data from the European Commission AMECO (Annual Macro-Economic Data) database. While limited in time scope, this dataset is gathered using a uniform methodology, which is particularly important in an attempt to perform a panel analysis. All data for expenditures, revenue, debt and deficit are presented at the general government level and defined in relation to GDP. The sample used in our analysis included ten Central and Eastern European countries (former transition countries and current European Union Member States: Bulgaria, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, Slovenia). The GDP data (millions of national currency at constant 2005 prices) necessary for computing an output gap was taken from the EUROSTAT database.

3.2 Testing for individual stationarity

As a first step, we used standard ADF tests to preliminarily assess the stationarity of the main fiscal time series: debt, revenues and total expenditures, inclusive of interest payments. Using the classic method proposed by Hamilton and Flavin (1986), we ran tests for both levels and first differences. For public debt, both $I(0)$ and $I(1)$, the test indicates fiscal sustainability. In the latter case Quintos (1995) denotes it as a weak sustainability. For the time series of fiscal revenue and expenditure, integration properties determine the methodology used to assess fiscal sustainability. As Hakkio and Rush (1991) point out, under differences in stationarity, the existence of cointegration between the two series presents a case for the presence of fiscal sustainability.

Table 1 | ADF Tests for Public Debt for Individual Countries, Full Sample

Sample: 1990 2012 Total number of observations: 152							
Country	t-Stat	Prob.	E(t)	E(Var)	Lag	Max Lag	Obs.
Bulgaria	-1.9353	0.3084	-1.500	1.060	1	2	14
Czech Republic	-0.1186	0.9315	-1.506	0.992	1	3	16
Estonia	-0.7595	0.7993	-1.354	1.297	3	3	14
Hungary	-1.7115	0.4046	-1.354	1.297	3	3	14
Lithuania	-0.8970	0.7617	-1.506	0.992	1	3	16
Latvia	0.7154	0.9879	-1.387	1.078	2	3	15
Poland	-0.4275	0.8833	-1.517	0.894	0	3	17
Romania	-2.0735	0.2564	-1.387	1.078	2	3	15
Slovakia	-3.8353	0.0135	-1.354	1.297	3	3	14
Slovenia	1.3989	0.9979	-1.517	0.894	0	3	17
Average	-0.9644		-1.438	1.088			

Table 1 presents the results of the ADF tests for individual time series of public debt. In almost all cases the time series seemed to be non-stationary. The only exception in our sample is Slovakia, for which the ADF test indicates a strong sustainability. However, in such short samples, as those under consideration, the integration tests are widely known to have low power, so it is very difficult to draw conclusions based on this method alone.

Table 2 | ADF Tests for Public Debt for Individual Countries, Pre-Crisis Sample 1990–2008

Sample: 1990 2008 Total number of observations: 120							
Country	t-Stat	Prob.	E(t)	E(Var)	Lag	Max Lag	Obs.
Bulgaria	-0.5092	0.8505	-1.488	1.255	1	1	10
Czech Republic	-2.0780	0.2549	-1.494	1.157	1	2	12
Estonia	-2.0943	0.2492	-1.510	0.981	0	2	13
Hungary	-0.6180	0.8316	-1.494	1.157	1	2	12
Lithuania	-1.6925	0.4099	-1.494	1.157	1	2	12
Latvia	-2.6139	0.1150	-1.510	0.981	0	2	13
Poland	-1.6423	0.4348	-1.510	0.981	0	2	13
Romania	-2.5366	0.1336	-1.333	1.352	2	2	11
Slovakia	-1.1858	0.6429	-1.494	1.157	1	2	12
Slovenia	-0.9911	0.7197	-1.494	1.157	1	2	12
Average	-1.5962		-1.482	1.134			

Since the analysed period included the years of financial crisis, one can specify a hypothesis that the result of lack of sustainability could be a sign of the financial turmoil in these years. To verify this presumption, we ran the same test using only the 1990-2008 sub-sample (Table 2). This time all time series, including Slovakia, appear to contain a unit root. This confirms our earlier presumption that results for individual countries in such a short sample are typically not robust and are sensitive to the inclusion of specific years in the sample under consideration. The results in general show that fiscal policy in these countries was not sustainable in a strong sense.

However, in line with the proof provided by Hamilton and Flavin (1986), the stationarity of public debt is a sufficient, albeit not necessary, condition for fiscal sustainability. The no-Ponzi game condition is still satisfied if debt is a variable integrated of order one. While not exact in a mathematical sense, this condition is loosely equivalent to stationarity of the fiscal deficit. The results of individual ADF test for first differences of public debt are presented in Table 3.

Table 3 | ADF Tests for First Differences of Public Debt for Individual Countries, Full Sample

Sample: 1990 2012 Total number of observations: 155							
Country	t-Stat	Prob.	E(t)	E(Var)	Lag	MaxLag	Obs.
Bulgaria	-5.5956	0.0006	-1.512	0.952	0	2	14
Czech Republic	-2.3644	0.1660	-1.516	0.909	0	3	16
Estonia	-0.7637	0.7981	-1.373	1.147	2	3	14
Hungary	-3.0649	0.0501	-1.516	0.909	0	3	16
Lithuania	-2.7102	0.0939	-1.516	0.909	0	3	16
Latvia	-3.3958	0.0283	-1.503	1.011	1	3	15
Poland	-3.5314	0.0210	-1.516	0.909	0	3	16
Romania	-1.9411	0.3070	-1.516	0.909	0	3	16
Slovakia	-2.6308	0.1075	-1.516	0.909	0	3	16
Slovenia	-2.5354	0.1261	-1.516	0.909	0	3	16
Average	-2.8533		-1.500	0.947			

When it comes to testing public debt being $I(1)$, the results are more varied compared to the case of $I(0)$. Out of the ten countries under consideration, in five the debt time series are difference - stationary, which indicates fiscal sustainability in a weak sense. Furthermore three - the Czech Republic, Slovakia and Slovenia - do not pass the test, with their test statistics being in the vicinity of the 10% significance level. Only one country clearly shows no mean-reverting behaviour - Romania, which underwent serious fiscal problems in the post-2008 period.

Bohn (2005) raises an interesting issue in sustainability testing. He presents a formal proof that fiscal policy is sustainable if the time series of public debt is integrated of any finite order. Following this proof, we could potentially test for public debt being $I(2)$ or even $I(3)$ and arrive at stationary cases after differencing the available time series a sufficient number of times. However, such an approach appears dubious for at least two reasons.

Firstly, differencing reduces the number of observations, which is a serious problem given the very short samples that are available. Moreover, since the order of integration is not predetermined, such an approach distorts the final size of the test sequence. Hence, instead of further differencing, we applied panel-based methods to test for the presence of sustainability, treating all CEE countries as a group.

3.3 Panel integration tests

Cases when test results may suggest no difference in stationarity do not necessarily suggest fiscal unsustainability in the long run. This result may emerge due to the aforementioned low power problem of these tests when using short samples. To check for this possibility, we performed a series of panel integration tests, using both levels and first differences of public debt. We present the results of these tests in Tables 4 and 5 below.

Table 4 | Panel Tests of the Stationarity of Public Debt in Levels

Sample: 1990 2012				
Method	Statistic	Prob.	Cross-sections	Obs.
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t	0.87384	0.8089	10	152
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	1.43648	0.9246	10	152
ADF - Fisher Chi-square	16.8991	0.6595	10	152
PP - Fisher Chi-square	15.2886	0.7597	10	168

Panel stationarity tests all consistently show that debt in the CEE countries was not stationary in a strong sense. This outcome is consistent for each test for all conventional levels of significance. In the panel setup, this result cannot be ascribed to an insufficient number of observations, so we treat this as a strong suggestion that public debt in the analysed sample is not an I (0) variable.

Table 5 | Panel Tests of the Stationarity of Public Debt in First Differences

Sample: 1990 2012				
Method	Statistic	Prob.	Cross-sections	Obs.
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t	-5.88649	0.0000	10	155
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-4.39854	0.0000	10	155
ADF - Fisher Chi-square	55.2990	0.0000	10	155
PP - Fisher Chi-square	60.0234	0.0000	10	158

In order to test for the presence of weak sustainability, we repeated application of the same battery of tests to first differences of public debt. All the tests that allow for individual autoregressive processes rejected the null hypothesis at all significance levels. While this result should be treated with caution due to its heterogeneity, in general fiscal debt series were difference-stationary, which indicates that fiscal policy in the CEE region was weakly sustainable (similarly as in India, see Tronzano, 2013). We achieved the same results (not reported here) using only the pre-crisis sample.

3.4 Panel cointegration test

As Quintos (1995) points out, the presence of a cointegration relationship between revenues and total expenditures, inclusive of interest payments, is also a sufficient condition for fiscal sustainability. Since cointegration tests typically require long samples, it is not feasible to draw conclusions based only on a country-by-country testing. Instead, we ran a battery of tests for the whole panel, consisting of our group of ten countries.

Table 6 | Pedroni Panel Test of the Presence of the Cointegration between Revenues and Total Expenditures, inclusive of Interest Payments

Sample: 1990 2012 Cross-sections included: 10				
Alternative hypothesis: common AR coeffs. (within-dimension)				
	Statistic	Prob.	Weighted Statistic	Prob.
Panel v-Statistic	1.195411	0.1160	0.113875	0.4547
Panel rho-Statistic	-3.380483	0.0004	-3.375392	0.0004
Panel PP-Statistic	-5.549798	0.0000	-5.235344	0.0000
Panel ADF-Statistic	-5.679919	0.0000	-5.043149	0.0000
Alternative hypothesis: individual AR coeffs. (between-dimension)				
	Statistic	Prob.		
Group rho-Statistic	-1.632803	0.0513		
Group PP-Statistic	-5.784766	0.0000		
Group ADF-Statistic	-5.408677	0.0000		

While results are not unambiguous, most tests point to the presence of a cointegration relationship in the analysed sample. Both Phillips-Perron and the Augmented Dickey-Fuller test statistics clearly reject the null of no cointegration, irrespective of the assumptions concerning the individual values of the autoregressive coefficients. The test based on the rho-statistic rejects the null of no cointegration under the assumption of a common autoregressive coefficient over the sample, while it fails to do so at the 5% level when varying AR coefficients are allowed. However, in the latter case the point value of the test statistic is very close to the respective critical value. Generally,

the available tests point to the presence of the cointegration relationship in the analysed panel, which indicates that these countries as a whole ran policies that were consistent with the intertemporal budget constraint.

3.5 Fiscal reaction functions

As Mackiewicz (2010) shows in a Monte Carlo study, one of the most reliable methods for assessing fiscal sustainability is estimation of the parameters of a fiscal reaction function. We estimated the parameters of the following behavioural equation:

$$s_t = a_0 + a_1 s_{t-1} + a_2 y_t + a_3 y_{t-1} + \rho b_{t-1} + \varepsilon_t \quad (2)$$

where s denotes the primary fiscal balance, b the stock of public debt and y – output gap. All variables were expressed as a ratio to GDP, while output gap, in line with the definition, was expressed as a ratio to potential GDP. The parameter of special interest is ρ , which indicates the reaction of primary balance to the changing level of public debt in the previous period. If this parameter is significantly different from zero (positive), this means that the growing stock of public debt effectively leads to generating a fiscal surplus, thus ensuring the long-run solvency of the public sector.

Table 7 | Estimation Results for the Parameters of Fiscal Reaction Function, Generalized Method of Moments

Sample: 1990 2012 Periods included: 16 Cross-sections included: 10 Total panel (unbalanced) observations: 159 Dependent variable: s_t				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
Const.	-0.020653	0.004623	-4.467381	0.0000
s_{t-1}	0.303056	0.134056	2.260675	0.0253
y_t	0.228254	0.038098	5.991244	0.0000
y_{t-1}	-0.206567	0.051041	-4.047076	0.0001
b_{t-1}	0.040244	0.012131	3.317418	0.0011
R-squared	0.576180	Mean dependent var		-0.012579
Adjusted R-squared	0.538182	S.D. dependent var		0.028113
S.E. of regression	0.019105	Sum squared resid		0.052925
Durbin-Watson stat	1.526353	J-statistic		2.17E-27
Instrument rank	14			

Because the proposed fiscal reaction function is a dynamic equation, the standard fixed effects OLS estimator is biased and inconsistent. To deal with this problem, we used the generalised method of moments estimator, first proposed by Arellano and Bond

(1991). Our results indicate that, at all conventional levels of significance, the parameter ρ is different from zero and positive. On average, a debt level higher than 10% of GDP resulted, in our sample, in a fiscal tightening by 0.4% of GDP measured by increase of primary fiscal balance. In line with current theory, such a reaction is sufficient to achieve and sustain the long-run compliance with the intertemporal budget constraint. Such a fiscal response means that the analysed group of countries is unlikely to follow the debt spiral and become insolvent in the long run.

4. Conclusions

In this paper we investigated the sustainability of public finances in the emerging Central and Eastern European countries. We used a group of ten countries and assessed their fiscal sustainability in two periods: an inclusive full sample period (1990–2012), and a pre-crisis sub-sample (1990–2008). The methods used for investigating sustainability included: (i) integration tests, (ii) cointegration tests and (iii) analysis of the properties of the fiscal reaction function. Both the individual and panel approach in testing sustainability were used.

Our results show that the assessment of the fiscal sustainability of CEE countries depends on the method used. Panel integration analysis shows that public finances in the analysed region are sustainable only in a weak sense. On the basis of unit root tests for each country we determined that only Slovakian public finances are sustainable in a strong sense. On the other hand, the analysed CEE countries show the presence of cointegration between revenues and expenditures. Moreover, an approach based on the fiscal reaction function implies the existence of a positive and statistically relevant relationship between public debts and primary surpluses. This indicates that, despite the inclusion of the periods of financial crisis, fiscal policy in the analysed countries was sustainable between 1990–2012. Unfortunately, due to the shortness of the sample, it was not possible to assess fiscal sustainability only in the times of crisis.

To sum up, both panel stationarity tests and the presence of panel cointegration between revenues and expenditures support the notion of sustainability in CEE countries. These results were also further confirmed by panel estimation of the fiscal reaction function, which indicated the positive relationship between fiscal surplus and lagged public debt. However, it was obtained that most of analysed countries do not express sustainability in a strong sense.

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