REM WORKING PAPER SERIES

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REM Working Paper 0101-2019

November 2019

REM – Research in Economics and Mathematics
Rua Miguel Lúpi 20,
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ISSN 2184-108X

Wagner and the Fading Voracity Effect: Short vs. Long-Run Effects in Developing Countries[1]

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May 2019

Abstract

This paper empirically revisits the validity of Wagner's proposition in a panel of 149 developing countries between 1980-2015 by focusing on different components of government expenditure. We rely on an ARDL approach which allow us to uncover short and long-run cyclicality coefficients. Our results do not overwhelmingly support the existence of higher than unity long-run elasticities of government spending components vis-a-vis economic growth, suggesting that the Wagner's regularity is more the exception than the norm. Moreover, the case for voracity is fading away as developing countries catch-up the development ladder and graduate from procyclicality. In fact, most short-run elasticities are countercyclical. Finally, some macroeconomic and institutional and political characteristics affect the degree of government spending cyclicality.

Keywords: government expenditure; fiscal policy; government size; political economy; mean group; panel stationarity; cross-sectional dependency; weighted least squares; autoregressive distributed lag

JEL codes: C33, E62, H50, O47

[1] This work was supported by the FCT (*Fundação para a Ciência e a Tecnologia*) [grant number UID/ECO/00436/2019]. The views and opinions expressed in this article are those of the authors and do not necessarily reflect the official view or position of the Portuguese Public Finance Council. Any remaining errors are the authors' sole responsibility.

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1. Introduction

Governments exist to provide public goods, address externalities, deal with imperfect information and overcome absence of specific markets (Grossman, 1988). Over time, the justification for government's existence became more complex since, for example, public investment in capital (both physical and human) was found to increase private productivity (and, hence, propel growth forward) (Khan and Kumar, 1997)[2] and social and general welfare support was seen as a desirable outcome (in face of, e.g., widespread needs stemming from acceleration in urbanization or upward social mobility).[3]

The last Global Financial Crisis highlighted many countries' fragilities and forced many governments to consider austere fiscal adjustment strategies and serious restructuring plans of their own public sectors. However, such rationing requirements deal directly with hard and highly (both politically and socially) sensible issues related to the appropriate (or "optimal") size of the government (expenditure). Rationally, the answer to this should depend on the contribution of each (expenditure) component to economic growth (Devarajan et al., 1996). However, in practice such answer is more complicated.

The relationship between government size and economic development goes back to Wagner´s "Law of Increasing State Activity". This Law states that as industrialization proceeds and development progresses, the relative importance of government spending in GDP will grow (Gemmel, 1993). According to Peacock and Scott (2000), this law refers to an absolute and relative increase in the size of the government within a given economy. Relatedly, the "voracity hypothesis" states that in response to a given shock to real GDP, government spending will rise by even more in percentage terms. Wagner explains the positive correlation between economic expansion and government growth in the long-run with an ongoing "cultural and economic progress" which substitutes private economic activity for state activity (Wagner, 1883).[4] Note that Wagner himself was nonetheless aware of the revenue constraints to continued public sector expansion (Peacock and Wiseman, 1961).

Existing empirical studies on the existence of the Wagner´s Law remain inconclusive. In fact, according to Durevall and Henrekson (2011), 65 percent of the studies reviewed find direct or

[2] The relationship between public spending and economic growth has been an important subject of discussion among economists for decades (Peacock and Wiseman, 1961; Gupta, 1967). Note however that the role of the government in facilitating economic prosperity is still controversial particularly regarding certain activities in which many argue that public ownership results in inefficient resource allocation (Khan and Kumar; 1997). Moreover, many government operations can crowd out private investment and distort economic incentives, leading to sub-optimal decisions and, therefore, harming growth (King and Rebelo, 1990). That being said, this paper's scope is not centered around debates surrounding the pros and cons of privatization (for that, the reader should refer to Vickers and Yarrow (1988)).

[3] Until the 20th century public revenues were considered more important than public expenditure, while functions and activities of the state were confined to specific limits (World Bank, 1988). This was inverted in subsequent decades. Governments can affect economic activity through several policy instruments and today one of the important instrument of fiscal policy is public spending (Lahirushan and Gunasekara, 2015).

[4] Henrekson (1993) develops the reasons behind Wagner's belief that the government's role would increase over time as a result of economic growth.

indirect evidence in favor of the Wagner's Law, while 35 percent provide no support. Against this background, in this paper we assess the responses of different components of government spending to changes in economic activity both in the short and long-run and also evaluate the main determinants of the obtained cyclicality coefficients. In other words, we empirically revisit the validation of the Wagner's Law and the "voracity hypothesis" in a sample of 149 developing countries between 1980-2015. A perusal of the literature (see next section) reveals no such study for such a large sample of developing countries carried out in a consistent way.

While in the literature on the size of the public sector with respect to a country's level of economic development has received much attention, we make several novel contributions. First, since some economists criticized Wagner's Law because of ambiguity of the measurement of government expenditure (Musgrave, 1969), instead of looking at aggregate public expenditures, we go much more granular into the different components of government expenditure. In fact, Shelton (2007) argued that the empirical validation of the Wagner's Law depends upon the preferences of fiscal policies set by governments and, hence, disaggregated the various categories of public spending. Second, we check the validity of the Law via panel data approaches that allow for the existence of cointegrating relationships between government expenditure and output. Third, since aggregate panel results hide cross-country heterogeneity, we inspect individual countries´ short and long-run cyclicality coefficients one at the time. Fourth, since voracity has been attributed to weak institutions (Stein et al., 1999; Akitoby et al., 2006), we inspect which key (political economy) determinants matter more in affecting short and long-run coefficients. Finally, we cross-check our baseline results with several robustness exercises, such as taking into account potential endogeneity concerns in estimating these spending elasticities and directly testing the existence of cointegration in the panel.

Evidence presented in this paper does not overwhelmingly support the existence of higher than unity long-run elasticities of government spending components vis-a-vis economic growth, suggesting that the Wagner's regularity is more the exception than the norm. However, this result depends on the exact component of government spending. In fact, great majority of EMEs display acyclical government spending policies confirming Frankel et al.´s (2013) claim that developing countries are escaping from the procyclicality curse. In LICs the number of procyclical cases is still slightly higher vis-à-vis EMEs. Moreover, the case for voracity is fading away as developing countries catch-up the development ladder and graduate from procyclicality with sounder fiscal policies that are better able to provide the well needed stabilization to shocks. In the short-run, most elasticity estimates suggest countercyclicality. Finally, some macroeconomic and institutional and political characteristics affect the degree of government spending cyclicality. However, the degree of political economy interference is less pervasive that other authors have uncovered for advanced economies.

The remainder of the paper is organized as follows. Section 2 briefly reviews the relevant literature. Section 3 presents the analytical framework, empirical methodology and underlying data. Section 4 discusses the main results. The last section concludes.

2. Review of the Empirical Literature

The literature has tested empirically the relationship between government spending and national income using several panel data approaches in both advanced and developing countries samples (but with the majority leaning more heavily on the former group). Empirical studies on this issue show that Wagner's Law differs from country to country and from period to period.

Time series studies focusing specifically on developing countries include the work by Ansari et al. (1997) who analyzed the relationship between national income and government expenditure for African countries from 1957 to 1990. Depending on the country they found evidence either in favor of Wagner's or Keynesian's hypothesis. Babatunde (2011) analyzed the existence of Wagner's hypothesis in Nigeria from 1970 to 2007 and found weak evidence supporting the Keynesian hypothesis. Ziramba (2008) analyzed the relationship between public spending and output in South Africa from 1960 to 2006 and found evidence of bi-directional causality. Thabane and Lebina (2016) confirmed the validity of the Wagner's hypothesis in Lesotho from 1980 to 2012. In another part of the developing world, Faris (2002) investigated the relationship between public spending and output for GCC countries from 1970 to 1997. Causality tests showed that the Wagner's hypothesis was applicable in these countries except Bahrain. Iyare and Lorde (2004) on the other hand, focused on several Caribbean countries from 1950 to 2000 and in most of the countries the Wagner's hypothesis was found to be valid. Montiel (2010) found evidence supporting the Wagner's hypothesis in Mexico from 1950 to 1990. In Asia, Afzal and Abbas (2010) examined the existence of Wagner's hypothesis in Pakistan from 1960 to 2007. They found evidence in favor of the Wagner's Law for total public spending, defense spending, interest payments and fiscal deficit. Rauf et al. (2012) and Muhammad et al. (2015) in contrast, found no causal link exists between public spending and output in the short run in Pakistan. Samudram et al. (2009) examined the existence of Keynesian or Wagner's hypothesis in Malaysia from 1970 to 2004. They found evidence of bidirectional causality. Abdullah and Mamoor (2010) also looked at the Malaysian case and found that long run relationship existed between government expenditure and economic growth.

Panel data studies looking at large heterogeneous samples, include the early paper by Ram (1987) who found no support for the Wagner's Law for a sample of 115 countries over 30 years. Chang et al. (2004) who examined the applicability of Wagner's hypothesis in both advanced and emerging countries from 1951 to 1996. Causality tests revealed that the Wagner's hypothesis was valid in Japan, US, UK, South Korea and Taiwan. Akitoby et al. (2006) determined the existence of a long-term relationship between economic activity and public expenditure using data of 51 countries over 32 years. Kolluri and Wahab (2007) found evidence supporting the Wagner's law for OECD countries but not for EU countries. For a sample of 23 OECD countries between 1970 and 2006, Lamartina and Zaghini (2011) concluded for the validity of Wagner's perspective. Afonso and Jalles (2014) study the causal relationship between spending and growth for 155 countries over 30 years. Their results supported the existence of the Wagner's law. Mahmoodi and Mahmoodi (2014) examined the relationship between government expenditure and economic

growth in twenty Asian countries from 1970 to 2010. Lahirushan and Gunasekara (2015) also examined the impact of government spending on economic growth on a sample of Asian countries and found evidence favoring both Keynesian and Wagner's hypothesis in short run.

3. Econometric Strategy and Data

3.1 Analytical Framework

To empirically assess the validity of the Wagner's law, we need to specify an econometric specification linking output and government expenditure. At this level of generality, the Law allows multiple versions (Mann, 1980).[5] To Henrekson (1993) it is unclear whether the law of increasing size of the state's activity relates to the absolute level of government or to the share of government in national income. Dutt and Ghosh (1997) argued that Wagner was neither explicit in hypothesis formulation nor presented his law in mathematical form. Absence of agreement on the functional form describing the Wagner's Law, led to different econometric specifications being applied to different countries (Halicioglu, 2003).[6]

With the exception of Akitoby et al. (2006), the majority of cross-country studies estimating the cyclicality of government expenditure have relied on panel approaches which do not fully exploit the time-series properties of the underlying data – recall the Wagner´s Law is a long-run concept. Moreover, most of these panel approaches are not well suited to properly and fully decompose short from long-run effects. One of the contributions of this work is the use of both the time-series and cross-sectional aspects of developing country data using an error-correction framework to assess fiscal cyclicality and, hence, confirm or refute the Wagner´s hypothesis.

We empirically investigate the relationship between government expenditure and output by generalizing Lane´s (2003) approach to encompass both short and long-term effects between the two variables. Specifically, as in Akitoby et al. (2006), government expenditure cyclicality is defined in relation to its movement vis-à-vis output.[7] We differentiate co-movements that are temporary and those that reflect a steady-state or long-term equilibrium level. Assume there exists a steady-state relation between government expenditure and output expressed as follows:

$$G = AY^{\theta} \tag{1}$$

where G represents real government expenditure, Y represents real GDP and θ is the long-run, constant elasticity of spending with respect to GDP. A positive value of θ is consistent with an expansive interpretation of Wagner´s Law, as it implies that government spending rises with output.

[5] In fact, the imprecision of the Law has led to the development of multiple versions of Wagner's hypothesis (Gandhi, 1971).
[6] See Demirbas (1999) for five alternative versions of the Wagner's Law.
[7] If potential output were observable or easy to estimate, one could define countercyclicality (procyclicality) as an above-average (below-average) spending to output ratio whenever output was below (above) its potential. However, measuring potential output is difficult, particularly in a development country setting.

If θ is greater than one then this would be consistent with a narrow interpretation of Wagner´s Law, where government expenditure rises faster than output.

3.2 Empirical Approach

Equation (1) can be written in linear form by log-linearizing it, as follows:

$$lnG = \alpha + \theta lnY,\ \alpha = lnA \tag{2}$$

If the adjustment of spending G to its steady-state $\bar{G}$ is gradual, then the level of spending will respond to transitory changes in output, and G will move gradually toward its steady-state. To capture these gradual move, we base our analysis on an unrestricted error correction Autoregressive Distributed Lag (ARDL) (p,q) representation:

$$\Delta \ln G_{it} = \varphi_i lnG_{it-1} + \theta_i lnY_{it-1} + \sum_{j=1}^{p-1} \lambda_{ij} \Delta \ln G_{it-j} + \sum_{q=1}^{q-1} \gamma_{ij} \Delta \ln Y_{it-j} + \mu_i + \xi_{it},$$

$$i = 1,2,\ldots,N; t = 1,2,\ldots,T \tag{3}$$

μ_i denote fixed effects to control for unobserved cross-country heterogeneity and time-invariant characteristics (such as geography, etc.); φ_i is a scalar coefficient on the lagged dependent variable. θ is a scalar coefficient on our key explanatory variable, real GDP; λ_{ij} correspond to coefficients on lagged first-differences of the dependent variable, and γ_{ij} correspond to coefficients on first-differences of our key explanatory variable and its lagged values. We assume that the disturbances ξ_{it} in the ARDL model are independently distributed across *i* and *t*, with zero means and constant variances. Equation (3) implies that developments in expenditures can be explained by a distributed lag of order *p* of the dependent variable and a distributed lag of order *q* of GDP.

Assuming that $\varphi_i < 0$ for all *i*, there exists a long-run relationship between $G_{it}$and Y_{it} defined as:

$$\ln G_{it} = \sigma_i \ln Y_{it} + \eta_{it}, i = 1,2,\ldots,N; t = 1,2,\ldots,T \tag{4}$$

where $\sigma_i = -\theta_i/\varphi_i$ is the long-run coefficient and η_{it} are stationary with possible non-zero means.[8] Equation (3) can then be rewritten as:

$$\Delta \ln G_{it} = \varphi_i \eta_{it-1} + \sum_{j=1}^{p-1} \lambda_{ij} \Delta \ln G_{it-j} + \sum_{q=1}^{q-1} \gamma_{ij} \Delta \ln Y_{it-j} + \mu_i + \xi_{it},$$

[8] Note that the existence of cointegration does not imply causality, which is consistent with Wagner´s view that there is not necessarily a cause and effect relationship between economic development and government activity (Peacock and Scott, 2000).

$i = 1,2,\ldots,N; t = 1,2,\ldots,T$ (5)

where η_{it-1} is the error correction term and φ_i is measures the speed of adjustment towards the long-run equilibrium. In cases where φ_i is insignificant, there is no steady-state relationship between government expenditure and output and γ_i is best estimated by omitting the error correction term.

Equation (5) is estimated for both aggregate government expenditure and its main components, namely wages and salaries, goods and services, capital expenditure, non-interest expenditure and interest payments. We fully exploit the panel dimension which has several advantages over traditional time series approaches.[9] Parameters in equation (5) are estimated using the Mean Group (MG) estimator (Pesaran and Smith, 1995). The MG is appropriate for the analysis of dynamic panels with both large time and cross-section dimensions, and it has the advantage of accommodating both the long-run equilibrium and the possibly heterogeneous dynamic adjustment process.[10]

In what follows, we perform three main exercises.

First, we implement three different panel unit root tests: two first generation tests, namely the Im, Pesaran, and Shin (2003) test (IPS); the Maddala and Wu (1999) test (MW) and one second generation test – the Pesaran (2007) CIPS test. The latter test is associated with the fact that first generation tests do not account for cross-sectional dependence of the contemporaneous error terms, and not considering it may cause substantial size distortions in panel unit root tests (Pesaran 2007).[11]

Secondly, we estimate equation (5) for the sample of emerging market economies and the sample of low-income countries are retrieve the short and long-run coefficient estimates as well as the speed of adjustment coefficients. We do so for the respective panels as well as for each country. We inspect the temporal stability of these key coefficient estimates by splitting the time span before and after the Global Financial Crisis (that we take as a major structural break).

Finally, we use the short and long-run cyclicality coefficient estimates as dependent variables in a cross-section regression that aims to check which political economy determinants matter the most. A number of explanations have been put forward to justify different cyclical fiscal patterns in different groups of countries. The two main reasons behind the observation of fiscal procyclicality in developing countries are: i) inadequate access to international credit markets and lack of financial depth (Gavin et al., 1996; Gavin and Perotti, 1997; Calderon and Schmidt-Hebbel,

[9] First, it enables bypassing lack of degree-of-freedom related to (potentially) short spanned time series at the cross-section level. Second, hypothesis testing is more powerful and inference stronger than when using time series techniques on only one country. Third, cross-sectional information reduces the probability of a spurious regression (Barnerjee, 1999).

[10] This estimator allows correcting for the potential bias that could result from estimating cyclicality coefficients using standard fixed-effects models in the presence of nonstationary error terms, which imposing parameter homogeneity would introduce into the estimating equation.

[11] We rely on panel stationarity tests - in contrast with Akitoky et al. (2006) – because the relatively short time span for some expenditure components and/or countries, renders low power to single-country unit root tests. Conducting Pesaran´s (2004) cross-sectional dependency tests for real GDP and each government expenditure variable, we reject in all cases the null of cross-sectional independence in our panel with p-values close to zero.

2008) and ii) political distortions and weak institutions (Tornell and Lane, 1999[12]; Alesina et al., 2008; Talvi and Vegh, 2005; Acemoglu et al. 2013; Fatas and Mihov 2013; Abbott, Cabral, Jones, Palacios, 2015). As Stein et al. (1999) pointed out – looking at a sample of Latin American countries - a large number of effective parties and weak support for the governing party were associated with stronger procyclicality. Similarly, Lane (2003) also acknowledges that political-economy factors explain the cyclicality of government spending in OECD countries. With this in mind, we run the following regression:

$$\hat{\sigma}_i = \alpha + \tau X_i + \omega POL_i + \varepsilon_i \quad (6a)$$

$$\hat{\gamma}_i = b + \tau X_i + \omega POL_i + \varepsilon_i \quad (6b)$$

where $\hat{\sigma}_i, \hat{\gamma}_i$ denote the long and short-run cyclicality coefficients, respectively; X is a vector of basic controls found in the literature to affect spending cyclicality and POL is a vector of political-economy variables. ε_i is an i.i.d disturbance term satisfying standard assumptions.

Since the dependent variable in equation (6) is based on estimates, the regression residuals can be thought of as having two components. The first component is sampling error (the difference between the true value of the dependent variable and its estimated value). The second component is the random shock that would have been obtained even if the dependent variable was observed directly as opposed to estimated. This would lead to an increase in the standard deviation of the estimates, which would lower the t-statistics. This means that any correction to the presence of this un-measurable error term will increase the significance of our estimates. To address this issue, equation is estimated using Weighted Least Squares (WLS). Specifically, the WLS estimator assumes that the errors in equation (6) are distributed as $\varepsilon_i \sim N(0, \frac{\vartheta^2}{s_i})$, where s_i are the estimated standard deviations of the spending cyclicality coefficients for each country i, and ϑ^2 is an unknown parameter that is estimated.

As far as determinants in X, we include real GDP per capita as a proxy of economic development in line with Talvi and Vegh (2005). This variable is expected to be negatively correlated with procyclicality. Government size has typically been found to be the most important driver (Woo, 2009; Furceri, 2010; Fatas and Mihov, 2013; Afonso and Jalles, 2014). We include the government expenditures-to-GDP ratio which is expected to negatively affect the degree of procyclicality under the assumption of unitary elasticity of taxes to GDP. Several variables have been used as proxies of the stringency of financial constraints. One is the degree of trade openness (defined as the sum of exports and imports over GDP) as a measure of access to foreign capital markets: economies that are more open to trade tend to be more exposed to external shocks and may use more actively fiscal policies in order to provide increased stabilization (Lane, 2003; Woo, 2009). Another the private credit-to-GDP ratio, as a higher level of financial development

[12] Tornell and Lane (1999) seminal framework highlighted different political blocs competing for a share of fiscal revenues. They argued that competition among these fiscal blocs increased during the boom period. This approach resulted in increased government expenditure as compared to increased general income – an effect known as voracity.

positively influences the ability of the government to borrow during downturns, and therefore it is expected to decrease fiscal procyclicality. Political-economy variables – vector POL - comprise of: dummies for the occurrence of executive elections since during elections politicians may be tempted to change fiscal components for electoral reasons and not necessarily for macroeconomic stabilization purposes (Persson and Tabellini, 2000); a proxy for constrains on the executive - following Acemoglu et al. (2013) and Fatas and Mihov (2013) - that captures potential veto points on the decisions of the executive and this variable is likely to reduce spending volatility and negatively influence procyclicality; the margin of majority, proportional representation, checks and balances, the polity2 indicator and regime durability. All these variables are retrieved from the Database of Political Institutions.

3.3 Data and Stylized Facts

Our empirical analysis uses a sample of 149 countries, split between 91 emerging market economies (EME) and 58 low-income countries (LIC) from 1980-2015. The complete list of countries by country-group is provided in the Appendix. The overall size of the sample is dictated by data availability from the Government Financial Statistics. More specifically, we rely on annual data for the following government expenditure components: wages and salaries, goods and services, capital, non-interest and interest payments. Note that the panel is unbalanced as each country' time series coverage differs. Data for real GDP and the GDP deflator come from the IMF's World Economic Outlook. Table A1 in the Appendix presents summary statistics.

Figure 1 below shows the time evolution of each government expenditure category by plotting the mean, median and top and bottom quartiles of the distribution for sample of developing countries. Total government expenditure declined from the early 1980s (from around 40 percent of GDP) until the early 2000s (to around 30 percent of GDP) to start increasing afterwards. The share of expenditure on wages and salaries has remained relatively flat over time in contrast with expenditure on goods and services which declined considerably and also public investment (to a lesser extent). This is worrisome as (productivity) growth is typically – in a standard Neoclassical Growth Model - propelled by (private and public) investment and this category has not been able to gain relative dimension over other spending components.[13] The rationalization effort of public expenditure is patent in the dynamics of non-interest expenditure. The Great Moderation phase also contributed to lower the burden from interest payments as interest on government debt lowered since the 1980s bringing down that bill significantly.

[insert Figure 1]

[13] Recall, however, Pritchett's (1996) "white elephant" hypothesis according to which not all public investment in developing countries is productive.

4. Empirical Results

4.1 Panel Stationarity

As a first step, Tables 1 and 2 report the panel unit root tests for output and government expenditure (and its components) for our sample of developing countries. We observe that in general one cannot reject the null of all country series in the case of real GDP containing a non-stationary process. In contrast, for total government expenditure and its components, we generally reject the null of panel unit root at a high significance level.

[insert Tables 1 and 2]

4.2 Short and Long-Run Estimates

Table 3 reports the panel estimates of estimating equation (5) for EMEs and LICs separately. We get a negative and always (expect in specification 12) statistically significant adjustment coefficient - φ_i -, indicating dynamic stability. From these significant coefficients we can conclude there is a cointegrating relationship between government expenditure and output. Looking at the long-run coefficient, it is generally statistically not different from zero except for LIC´s and total government expenditure and capital expenditure (at the 10 percent level). This means that there seems to exist a long-term relationship between government expenditure (particularly capital) and output in the panel of LICs, a fact consistent with the Wagner´s Law. For total government expenditure the significant coefficient for LICs is larger than one consistent with the narrow interpretation of the Law, that is, that the public sector in this group of countries increase in relative importance over time. The short-run coefficient is typically negative and highly significant everywhere.

[insert Table 3]

One can discriminate the country-specific coefficients. The resulting coefficients for the speed of adjustment, the short and long-run cyclicality can be summarized using histograms in Figures 2-4, respectively, and for each expenditure category. The speed of adjustment is the largest (in absolute value) for the case of capital expenditure. While interest payments have an average speed of adjustment close to zero (suggesting that the correction towards the long-run steady state is very slow-moving), it is also the category where the standard deviation of such coefficients is the largest.

[insert Figures 2-4]

In Figure 3 we plot the histograms for the long-run coefficients. The average long-run coefficient is the largest for expenditure on goods and services (and also the one with the highest

cross-cross variation as shown by the standard deviation). In all cases the mode of long-run coefficients – in line with the evidence provided in Table 3 – is close to zero.

Finally, Figure 4 summarizes the information regarding the short-run coefficients.

Aggregate statistics and summarizing tools such as the histogram, while useful to give an overall picture, hide considerable heterogeneity across countries. As in Akitoby et al. (2006), we plot in Tables 4, 5 and 6 the country specific coefficients from estimating equation (5). In cases where the speed of adjustment - φ_i - is significant, we can conclude there is a cointegrating relationship between a given government expenditure variable and output. Tables 5a and 5b report the associated long-term elasticity, while Tables 6a and 6b show the short-run cyclicality coefficients.

The most salient results are as follows.

For most EMEs, there is a long-term relationship between government expenditure and GDP (Table 4a), consistent with Wagner´s Law. The error correction term is significant in about 50 percent of the countries in the sample for total government expenditure and more than 70 percent for each spending aggregate with most of the sample having a significant error correction term for at least one of the spending aggregates. For example, the error correction term is significant for interest payments in Hungary but is insignificant for the other spending aggregates. As expected, the adjustment coefficients are (in general) negative (some exceptions such as Venezuela for total government expenditure suggesting an "explosive" system), indicating dynamic stability. Recall again that the implication of a significant error correction term is that there is in fact a long-term relationship between government spending and GDP. In Table 4b we have the country-specific φ_i for LICs. Here the share of statistically significant coefficients is smaller relative to the EMEs sample. Hence, in LICs we find less cases supporting the existence of a long-run coefficient between expenditures and output.

[insert Tables 4a and 4b]

In Table 5a we show the long-run coefficients for EMEs. In only 22 percent of the cases we find a statistically significant coefficient, with most of them being positive. This suggests procyclicality for the countries with positive and significant coefficients, but for the great majority evidence seems to point to acyclicality.[14] This contrasts with previous literature looking at developing countries that typically found evidence of procyclical patterns, that is, spending indicators comoving positively with the business cycle (Gavin et al., 1996; Kaminsky, Reinhart and Vegh, 2004; Talvi and Vegh, 2005; Ilzetzki and Vegh, 2008; Diallo, 2009). In fact, our results

[14] Most discussions on the cyclicality patterns of fiscal policy in general are centered around two main theories linking it to business cycle fluctuations: the Keynesian approach and the Neoclassical tax-smoothing model (Barro, 1979). The Keynesians posit that governments should spend and tax countercyclically, i.e., boosting demand through increased spending or lower taxes during a recession and doing the opposite during booms (Prasad and Gerecke, 2010). In contrast, Barro's tax-smoothing model recommends acyclical fiscal policy that helps keep government expenditure and tax rates constant regardless of output fluctuations.

confirm Frankel et al.´s (2013) claim that developing countries are escaping from the procyclicality trap. These authors argued that over the last decade about one third of the developing world escaped the procyclicality trap and engaged in countercyclical fiscal policy. In a small number of countries (e.g. Croatia) fiscal policy is, in fact, countercyclical in the long-run (this is true for total government expenditure and any sub-component under scrutiny). Moreover, in the cases where the long-run coefficient is positive and significant, it is often larger than one which is consistent with the narrow interpretation of Wagner´s law and indicating that in the long term, the public sector is increasing in relative importance (e.g. South Africa, Venezuela, Suriname, Angola). In LICs – Table 5b – about one third of the countries display a procyclical long-run coefficient, a larger percentage vis-à-vis EMEs. For instance, in Guinea, Uganda or Uzbekistan, the coefficient is larger than one while in Niger, Liberia or Afghanistan it is positive but smaller than one – consistent with the expansive interpretation of Wagner´s Law.

[insert Tables 5a and 5b]

Finally, the short-run elasticity of government spending to GDP is negative in most of the countries in the sample in contrast with the evidence presented by Akitoby et al. (2006) who looked at a smaller country coverage and time span (see Tables 6a and 6b). For all spending categories, the mean coefficient values are negative. For instance, in EMEs for Armenia and in LICs for Mozambique, the short-run elasticities are positive and statistically significant with a coefficient value above unity. This fact is consistent with the voracity hypothesis, as it suggests that in response to a given shock to real GDP, government spending will rise by even more in percentage terms. This situation is even stronger when interest payments are excluded.

[insert Tables 6a and 6b]

Overall, our findings contrast less sharply (than previous literature) with those obtained for developed countries which often suggest either a countercyclical behavior of fiscal policy or no clear patterns (acyclicality) (see e.g. Hallerberg and Strauch, 2002). The size of the long-run elasticity with respect to output varies greatly across countries (much more than the short-run elasticity). When comparing the short-term and the long-term coefficients for countries where there is a long-term relationship between government spending and output, we find that in most cases the long-run elasticity is larger than that for the short-run (in absolute value).

4.3 Robustness

We check the robustness of the previous set of findings in three main ways.

First, we investigate the possibility of endogeneity in estimating the cyclicality coefficients. For OECD countries, Lane (2003) finds that endogeneity was not an issue and he used OLS to estimate cyclicality coefficients. In Table A2 in the Appendix we present the Durbin-Wu-Hausman statistics for country-specific endogeneity tests. A single-country two stage least squares

regression was estimated for total government expenditure using the first lag of domestic GDP and the growth rate of main trading partners as instruments for real GDP. Results reveal that endogeneity could have deleterious effects on our estimates in 30 out of 149 countries for total government spending which represents only 20 percent of the sample. Excluding countries for which null hypothesis of no-endogeneity could not be rejected and re-estimating equation (5) yields coefficient estimates qualitatively similar to those present in Table 3. This suggests that endogeneity concerns are not an issue.

Second, as identified in the introduction, the Global Financial Crisis (GFC) had a major impact on the way public finances are conducted. We re-estimated equation (5) splitting the time span before and after 2008 (the first year of the GFC). Results in Table A3 show the coefficient estimates for EMEs and LICs using total government expenditure as dependent variable. We observe that while before the GFC the long-run coefficient is positive and larger than one, suggesting a procyclical fiscal policy in EMEs, afterwards results point to long-run acyclicality. Hence, this major structural break did change the path of government size expansion in these countries. In addition, the speed of adjustment is considerably larger after the GFC than before. This is also true for other expenditure components (Table A4). There is no statistically significant difference with respect to the short-run coefficients between the two time periods.

Third, we inspect whether government expenditure (and its components) and GDP are cointegrated within the panel. To this end, we implement the panel cointegration tests proposed by Pedroni (2004). This is a residual-based test for the null of no cointegration in heterogeneous panels.[15] We use four within-group tests and three between-group tests to check whether the panel data are cointegrated. In Table A5 the columns labelled within-dimension contain the computed value of the statistics based on estimators that pool the autoregressive coefficient across different countries for the unit root tests on the estimated residuals. The columns labelled between-dimension report the computed value of the statistics based on estimators that average individually calculated coefficients for each country. Results of the within-group tests and the between-group tests show that the null hypothesis of no cointegration can be rejected only in the cases of output with wages and salaries and output with capital expenditure (particularly in the case of LICs). Therefore, the relationships identified in equations (3) and (4) are cointegrated for the panel of all countries in our sample for these two categories of spending. In the remaining cases, there is no evidence of a significant stable long-run relationship.

[15] Two classes of statistics are considered. The first type is based on pooling the residuals of the regression along the within-dimension of the panel; the second is based on pooling the residuals of the regression along the between-dimension of the panel.

4.4 Political Economy Determinants of Spending Cyclicality

Our final exercise is the inspection of the relevance of certain political economy variables in affecting short and long-run cyclicality coefficients in our sample of developing countries. Estimating equation (6a) (6b) for each of the long-run (short-run) coefficient estimates previously obtained we get the results present in Table 7a (Table 7b).

[insert Tables 7a and 7b]

We find that, the initial level of per capita GDP is generally negative but not statistically significant, suggesting that the level of development in itself is not a factor explaining fiscal procyclicality in our sample of developing countries. We also find that economies more open to trade tend to be less procyclical even though the significance is inexistence. Similarly, countries with larger government are also able to provide more stabilization by acting more countercyclically. Finally, most political economy variables do not seem to matter much in explaining the degree of procyclicality in the short-run. In the long-run however, having elections often increases the degree of procyclical fiscal policy, while proportional representation lowers it. Finally, we get a negative and weakly significant (i.e., at the 10 percent significance level) relation between democracy and procyclicality, suggesting that increased democracy improves fiscal management which is in contrast with the findings of Alesina and Tabellini (2005).

5. Conclusion

This paper empirically revisited the validity of Wagner's proposition by focusing on different components of government expenditure and looking at both the short and the long-run. The panel under scrutiny consisted of 149 developing countries between 1980-2015. We relied on panel data approaches and contributed to the literature by estimating underlying cointegrating relationships and uncovering short and long-run cyclicality coefficients for different countries. In addition, we assessed which political economy determinants (if any) affected these elasticities.

For most EMEs, there seems to exist a long-term relationship between government expenditure and GDP, a fact consistent with Wagner´s Law. The number of significant error correction terms is much smaller in the case of LICs. However, this result depends on the exact component of government spending. Moreover, in EMEs evidence points to procyclicality in a relatively small number countries with positive and significant long-run elasticities, but with the great majority displaying acyclical government spending policies. This contrasts with previous literature looking at developing countries that typically found evidence of procyclical patterns but confirms Frankel et al.´s (2013) claim that developing countries are escaping from the procyclicality curse. In LICs about one third of the countries display a procyclical long-run coefficient, a larger percentage vis-à-vis EMEs. This is likely to have amplified GDP fluctuations and, more generally, weakened the development efforts in several of these LICs. In some cases, the significant long-run cyclicality

coefficients are larger than one, a fact consistent with the narrow interpretation of Wagner´s Law. Furthermore, in a small number of countries, short-run elasticities are positive and statistically significant with a coefficient value above unity consistent with the voracity hypothesis. However, this is considerably less prevalent in our paper than in previous studies looking at earlier time periods. Interestingly, in most cases we found evidence of counter-cyclicality in the short-run in several government spending components. As far as robustness is concerned, endogeneity does not seem to be an issue and the GFC acted as a major structural break since it changed the patterns of government size expansion in this sample of these developing countries. Finally, we uncovered that some macroeconomic and institutional and political characteristics can affect the degree of government spending cyclicality. However, the degree of political economy interference is less pervasive that other authors have uncovered for advanced economies.

All in all, evidence presented in this paper does not overwhelmingly support the existence of higher than unity elasticities of government spending categories vis-a-vis economic growth, suggesting that the Wagner's regularity is more the exception than the norm. Also, the case for voracity is fading away as developing countries catch-up the development ladder and graduate from procyclicality with sounder fiscal policies that are better able to provide the well needed stabilization to shocks.

Future research on the topic should consider looking at the consequences for this group of countries of the graduation from procyclical to countercyclical government fiscal policy in terms of domestic macroeconomic volatility and long-term growth.

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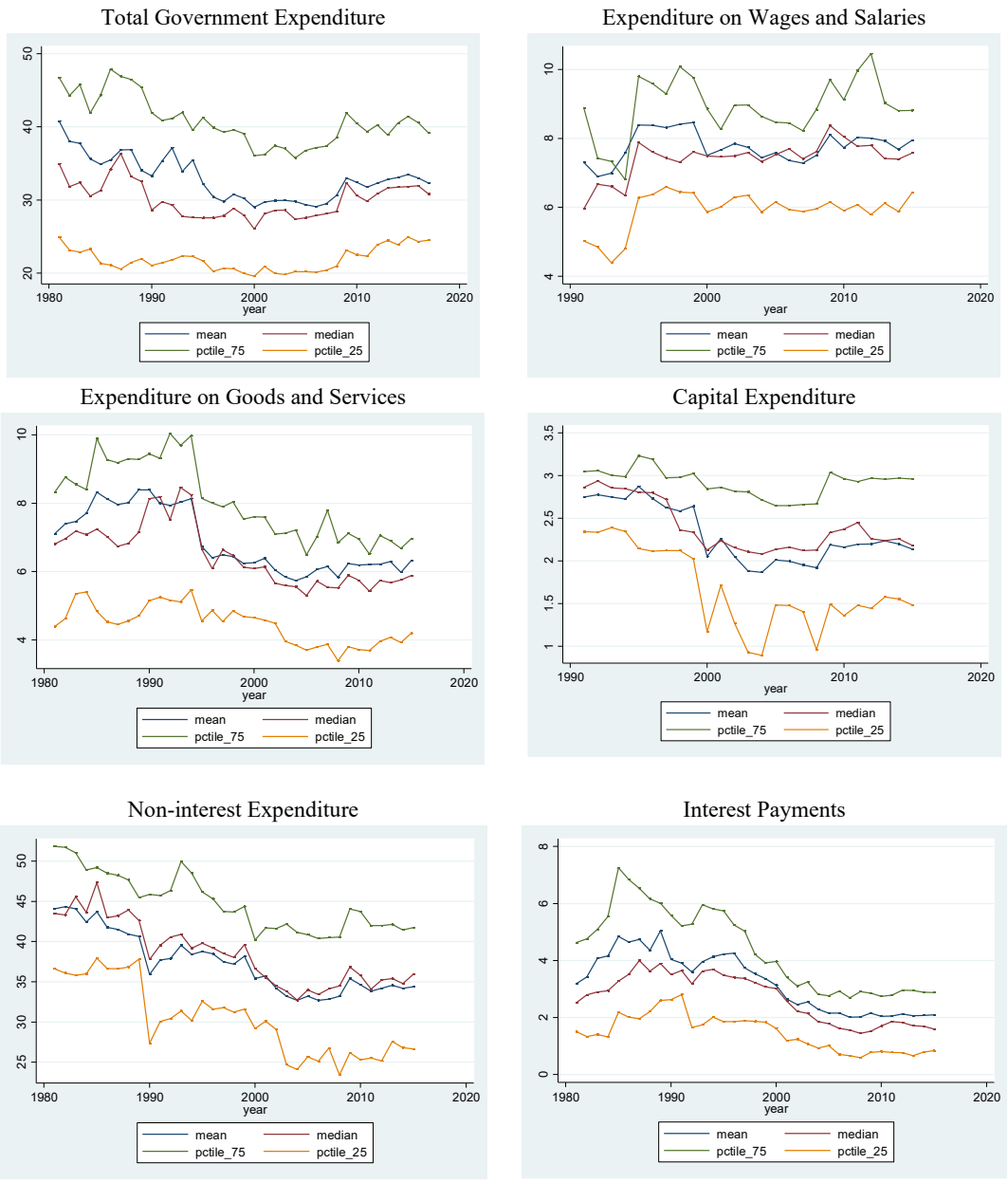
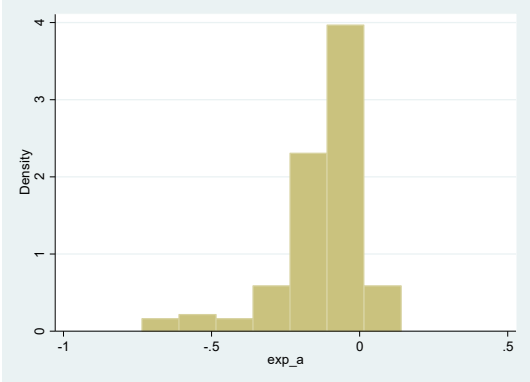
Figure 1: Evolution of Government Expenditures (% GDP) in Developing Countries over time, 1970-2015



Note: blue line denotes the average or mean across all countries; red line denotes the median across all countries; yellow line denotes the 25th percentile of the distribution across all countries; green line denotes the 75th percentile of the distribution across all countries.

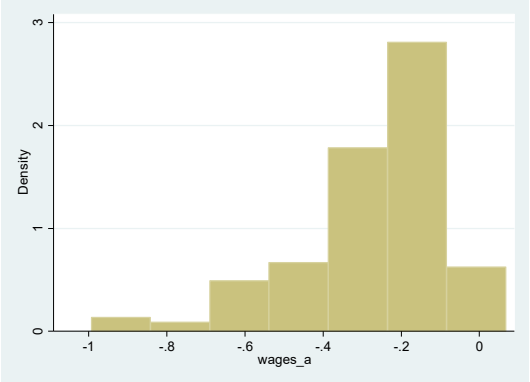
Figure 2. Histograms for the adjustment speed, Developing Countries

Total government expenditure



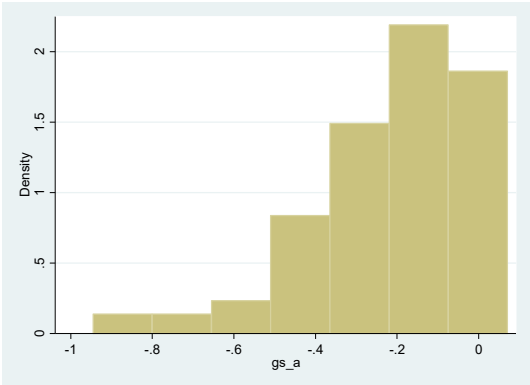
mean: -0.12; sd dev.: 0.14

Expenditure on Wages and Salaries



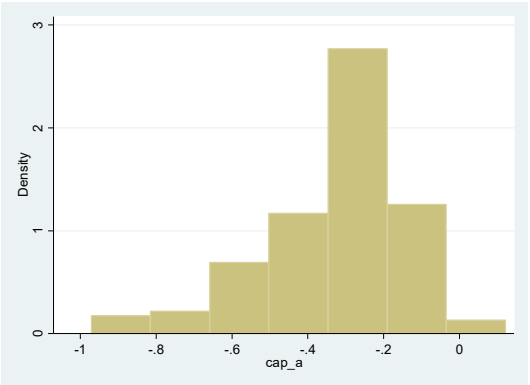
mean: -0.32; sd dev.: 0.67

Expenditure on Goods and Services



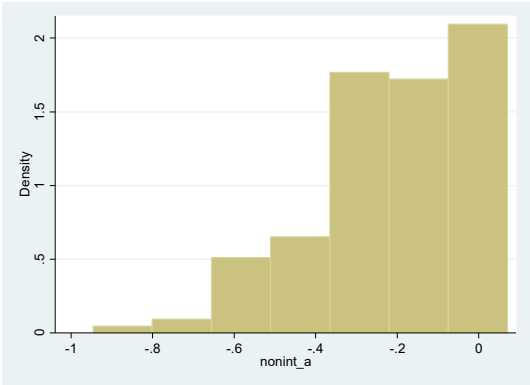
mean: -0.25; sd dev.: 0.49

Capital Expenditure



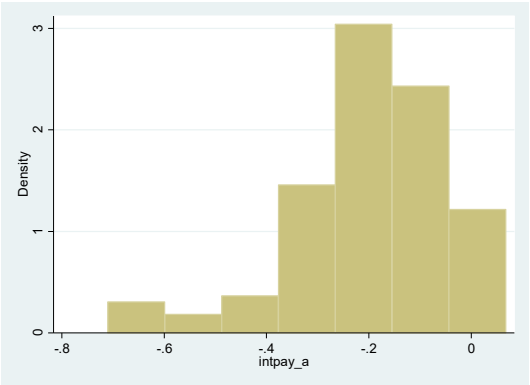
mean: -0.39; sd dev.: 0.84

Non-interest Expenditure



mean: -0.33; sd dev.: 1.50

Interest Payments

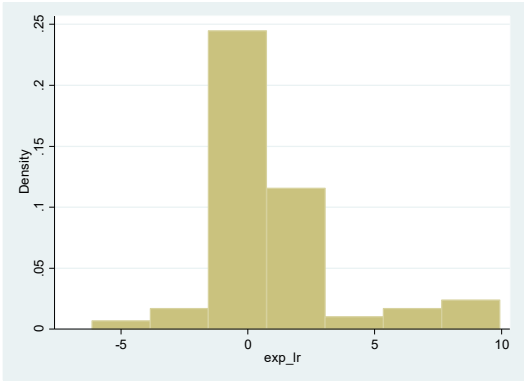


mean: -0.02; sd dev.: 2.19

Note: histogram of country-specific adjustment speed coefficients resulting from estimating equation (5). All coefficients considered.

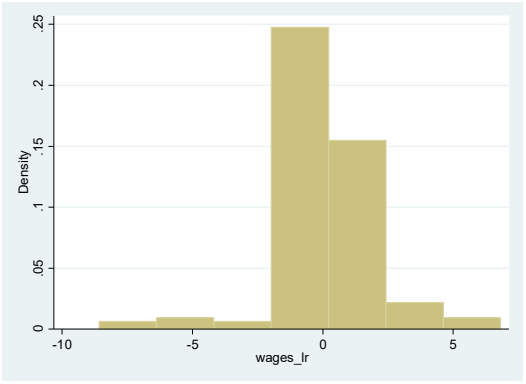
Figure 3. Histograms for the long-run coefficients, Developing Countries

Total government expenditure



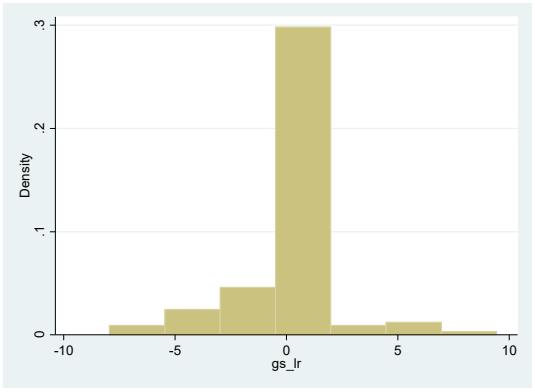
mean: 4.23; sd dev.: 33.26

Expenditure on Wages and Salaries



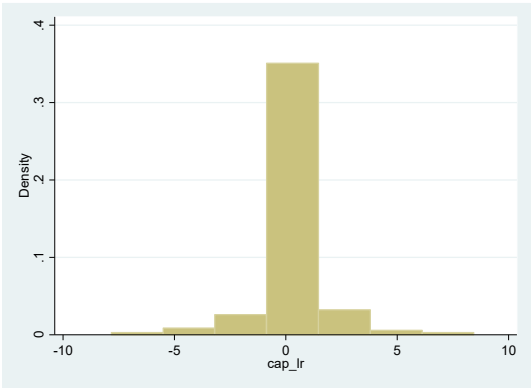
mean: -0.25; sd dev.: 4.62

Expenditure on Goods and Services



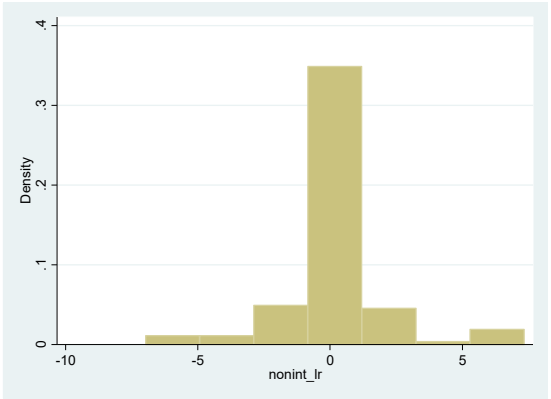
mean: 8.17; sd dev.: 110.42

Capital Expenditure



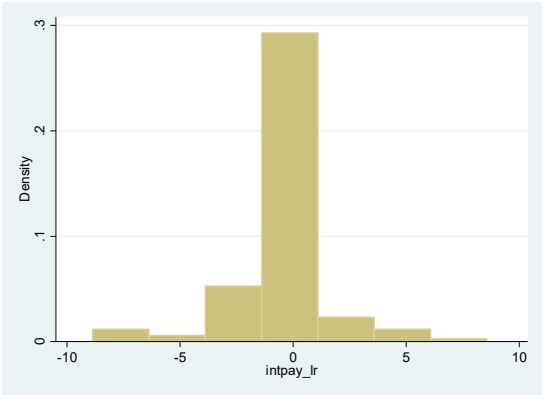
mean: -0.02; sd dev.: 2.27

Non-interest Expenditure



mean: 3.84; sd dev.: 48.98

Interest Payments

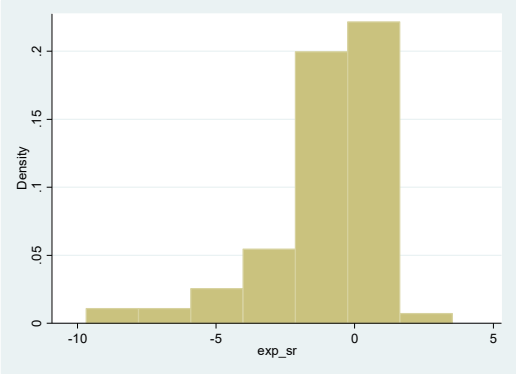


mean: 0.98; sd dev.: 28.35

Note: histogram of country-specific long-run coefficients resulting from estimating equation (5). All coefficients considered.

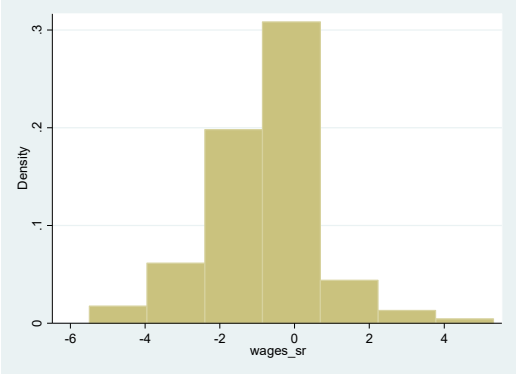
Figure 4. Histograms for the short-run coefficients, Developing Countries

Total government expenditure



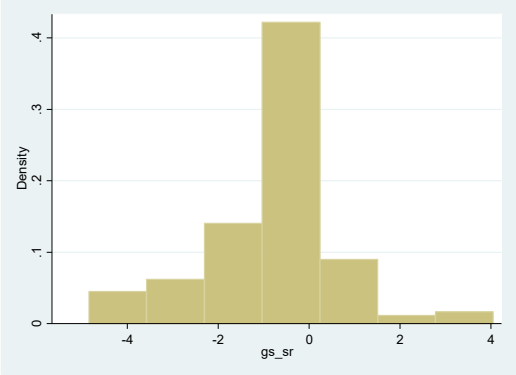
mean: -1.33; sd dev.: 2.68

Expenditure on Wages and Salaries



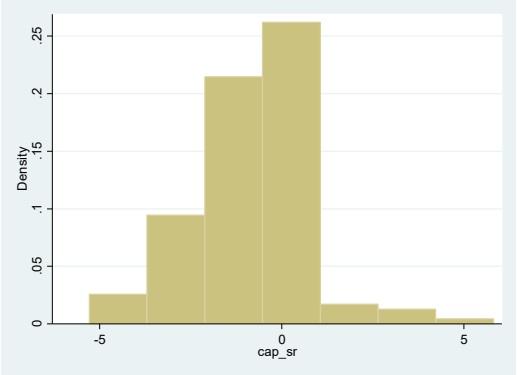
mean: -0.97; sd dev.: 2.08

Expenditure on Goods and Services



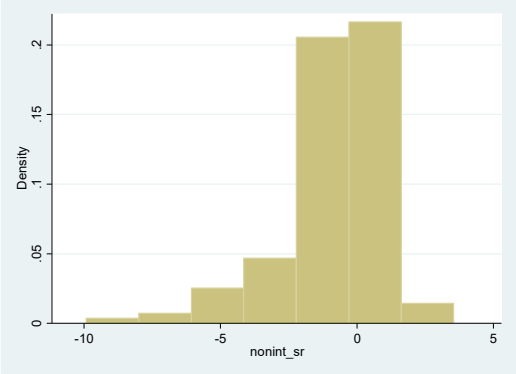
mean: -1.32; sd dev.: 3.21

Capital Expenditure



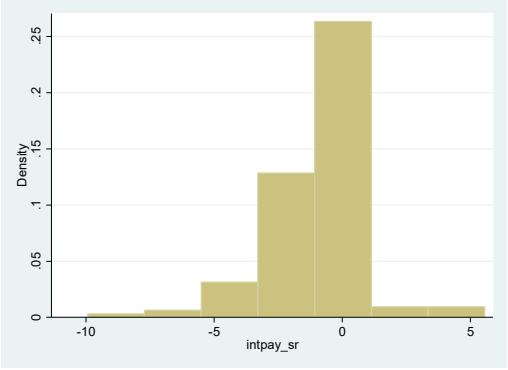
mean: -0.97; sd dev.: 2.09

Non-interest Expenditure



mean: -1.37; sd dev.: 3.18

Interest Payments



mean: -1.41; sd dev.: 3.15

Note: histogram of country-specific short-run coefficients resulting from estimating equation (5). All coefficients considered.

Table 1: First Generation Panel Unit Root Tests

Im, Pesaran and Shin (2003) Panel Unit Root Test (IPS) (a)

	Real GDP		Government expenditure		Wages and salaries		Goods and services		Capital expenditure		Non-interest expenditure		Interest Payments	
in levels	*lags*	*[t-bar]*	*lags*	*[t-bar]*	*lags*	*[t-bar]*	*lags*	*[t-bar]*	*lags*	*[t-bar]*	*lags*	*[t-bar]*	*lags*	*[t-bar]*
EME	0.60	2.56	0.59	-7.06***	0.18	-18.42***	0.38	-11.26***	0.43	-14.68***	0.55	-10.52**	0.38	-12.71***
LIC	0.59	11.93	0.43	-1.15	0.22	-12.70***	0.34	-10.82***	0.17	-11.10***	0.41	-7.53***	0.55	-13.15***

Maddala and Wu (1999) Panel Unit Root Test (MW) (b)

		Real GDP		Government expenditure		Wages and salaries		Goods and services		Capital expenditure		Non-interest expenditure		Interest Payments	
	lags	p_λ	*(p)*	p_λ	*(p)*	p_λ	*(p)*	p_λ	*(p)*	p_λ	*(p)*	p_λ	*(p)*	p_λ	*(p)*
	in levels														
EME	0	171.868	0.403	957.919	0.000	1269.868	0.000	1151.328	0.000	1176.807	0.000	1184.705	0.000	836.776	0.000
	1	141.482	0.932	459.764	0.000	449.019	0.000	483.229	0.000	636.375	0.000	456.079	0.000	613.591	0.000
	2	115.949	0.999	439.740	0.000	473.349	0.000	438.934	0.000	223.680	0.003	455.308	0.000	403.278	0.000
	in levels														
LIC	0	41.280	1.000	782.123	0.000	800.286	0.000	638.309	0.000	648.909	0.000	719.581	0.000	751.303	0.000
	1	40.174	1.000	375.177	0.000	326.076	0.000	379.183	0.000	327.102	0.000	404.896	0.000	215.235	0.000
	2	29.254	1.000	440.538	0.000	552.020	0.000	458.958	0.000	362.396	0.000	478.079	0.000	273.420	0.000

Notes: All variables are in logarithms. (a) We report the average of the country-specific "ideal" lag-augmentation (via AIC). We report the t-bar statistic, constructed as $t-bar=(1/N)\sum_i t_i$ (t_i are country ADF t-statistics). Under the null of all country series containing a nonstationary process this statistic has a non-standard distribution: the critical values (-1.73 for 5%, -1.69 for 10% significance level – distribution is approximately *t*) are reported in Table 2, Panel A of their paper. We indicate the cases where the null is rejected with ***. (b) We report the MW statistic constructed as $p_\lambda = -2\sum_i \log(p_i)$ (p_i are country ADF statistic p-values) for different lag-augmentations. Under the null of all country series containing a nonstationary process this statistic is distributed $\chi^2(2N)$. We further report the p-values for each of the MW tests.

Table 2: Second Generation Panel Unit Root Tests

Pesaran (2007) Panel Unit Root Test (CIPS)

		Real GDP		**Government expenditure**		**Wages and salaries**		**Goods and services**		**Capital expenditure**		**Non-interest expenditure**		**Interest Payments**	
	lags	p_λ	*(p)*	p_λ	*(p)*	p_λ	*(p)*	p_λ	*(p)*	p_λ	*(p)*	p_λ	*(p)*	p_λ	*(p)*
	in levels														
EME	0	*3.543*	*1.000*	-5.526	0.000	-7.134	0.000	-10.150	0.000	-8.852	0.000	-10.806	0.000	-6.076	0.000
	1	2.776	0.997	-5.190	0.000	-8.002	0.000	-9.838	0.000	-7.050	0.000	-8.412	0.000	-5.605	0.000
	2	7.641	1.000	-6.445	0.000	-9.736	0.000	-6.715	0.000	-10.186	0.000	-9.843	0.000	-12.734	0.000
	in levels														
LIC	0	7.630	1.000	-4.960	0.000	-4.972	0.000	-4.800	0.000	-4.818	0.000	-5.108	0.000	-4.525	0.000
	1	2.296	0.898	-6.821	0.000	-5.916	0.000	-8.621	0.000	-5.864	0.000	-7.352	0.000	-6.016	0.000
	2	5.391	1.000	-5.047	0.000	-2.533	0.000	-6.425	0.000	-2.575	0.000	-2.153	0.016	-4.158	0.000

Notes: All variables are in logarithms. The null hypothesis is of nonstationarity.

Table 3. Mean Group Regressions, EME vs LIC

Dependent variable	*Government Expenditure*		*Wages and Salaries*		*Goods and Services*		*Capital expenditure*		*Non-interest expenditure*		*Interest Payments*	
Country Group	EME	LIC	EME	LIC	EME	LIC	EME	LIC	EME	LIC	EME	LIC
Specification	1	2	3	4	5	6	7	8	9	10	11	12
Speed of adjustment	-0.128***	-0.114***	-0.288***	-0.393***	-0.220***	-0.314***	-0.335***	-0.480***	-0.234***	-0.488	-0.201***	0.261
	(0.016)	(0.018)	(0.019)	(0.139)	(0.020)	(0.100)	(0.021)	(0.175)	(0.021)	(0.316)	(0.015)	(0.462)
Short run coefficient	-1.360***	-1.286***	-0.993***	-0.947**	-1.194***	-1.533**	-1.036***	-0.885**	-1.275***	-1.520**	-1.333***	-1.552***
	(0.228)	(0.442)	(0.152)	(0.370)	(0.200)	(0.602)	(0.150)	(0.374)	(0.200)	(0.594)	(0.195)	(0.592)
Long run coefficient	2.221	7.406*	-0.570	0.231	12.126	1.972	-0.256	0.339*	1.386	7.700	-1.687	5.178
	(3.665)	(3.996)	(0.599)	(0.249)	(14.689)	(3.211)	(0.272)	(0.210)	(4.152)	(8.018)	(2.082)	(4.976)
Observations	3,781	2,350	2,187	1,381	2,902	1,814	2,187	1,381	2,902	1,814	2,902	1,814

Note: Estimation of Equation (5). Standard errors in parenthesis. *, **, *** denote statistical significance at the 10, 5 and 1 percent levels, respectively.

Table 4.a Error correction model: adjustment term, Emerging Market Economies

Country	Total expenditure	Wages and salaries	Goods and services	Capital	Non-interest	Interest payments
Turkey	-0.006	-0.076***	-0.023	-0.082***	-0.018	-0.029
South Africa	-0.099**	-0.157	-0.173***	-0.214	-0.148**	-0.186***
Argentina	0.006	0.068	-0.044*	0.122	-0.042	-0.050*
Brazil	-0.005	-0.230***	-0.009	-0.236***	-0.008	-0.012
Chile	-0.075***	-0.271***	-0.032	-0.491***	-0.028	-0.086*
Colombia	-0.027	-0.151***	-0.063**	-0.194***	-0.058**	-0.091***
Costa Rica	-0.017	-0.104*	-0.275***	-0.270**	-0.274***	-0.258***
Dominican Republic	-0.049	-0.227	-0.087	-0.187	-0.076	-0.109*
Ecuador	-0.136**	-0.401**	-0.165*	-0.189	-0.200*	-0.233***
El Salvador	-0.180***	-0.387**	-0.305**	-0.309*	-0.386***	-0.272***
Guatemala	-0.033	-0.255***	-0.096	-0.561***	-0.088	-0.078
Mexico	-0.052***	-0.039	-0.072***	-0.021	-0.063***	-0.084***
Panama	-0.123***	-0.382**	-0.154	-0.195	-0.137	-0.251***
Paraguay	-0.063*	-0.106*	-0.045	-0.137*	-0.039	-0.076
Peru	0.009	-0.440***	-0.018	-0.489***	-0.016	-0.023
Uruguay	-0.004	-0.164***	-0.034*	-0.186***	-0.031	-0.052**
Venezuela	0.141***	-0.040	0.002	-0.044	-0.003	-0.021
Antigua and Barbuda	-0.090**	-0.314**	-0.197**	-0.310*	-0.538***	-0.206***
Bahamas, The	-0.104**	-0.444**	-0.241**	-0.598***	-0.586***	-0.262***
Barbados	-0.117**	-0.347**	-0.155	-0.350**	-0.299**	-0.316***
Dominica	-0.093**	-0.355**	-0.200**	-0.238*	-0.405***	-0.208***
Grenada	-0.092**	-0.354**	-0.218**	-0.423**	-0.606***	-0.256***
Guyana	0.014	-0.579***	0.000	-0.658***	0.002	-0.033
Belize	-0.122***	-0.253**	-0.225**	-0.335**	-0.565***	-0.209***
Jamaica	-0.055	-0.276***	-0.237**	-0.292***	-0.239***	-0.215**
St. Kitts and Nevis	-0.088**	-0.338**	-0.244***	-0.368**	-0.552***	-0.184***
St. Lucia	-0.096**	-0.351**	-0.186**	-0.242	-0.384***	-0.141***
St. Vincent and the Grenadines	-0.105**	-0.341**	-0.222**	-0.420**	-0.662***	-0.209***
Suriname	0.048*	-0.014	0.047	-0.040	0.054	0.038
Trinidad and Tobago	-0.048*	-0.068	-0.073	-0.244*	-0.050	-0.170***
Bahrain	-0.143**	-0.400***	-0.193*	-0.321**	-0.248*	-0.327***
Iran	-0.047	-0.488***	-0.197*	-0.535***	-0.198*	-0.182*
Iraq	-0.708***	-0.993***	-0.893***	-0.835***	-0.946***	-0.556**
Jordan	-0.054	-0.443***	-0.152**	-0.184	-0.120*	-0.238***
Kuwait	-0.127**	-0.307**	-0.353***	-0.238	-0.312**	-0.232***
Lebanon	-0.025	-0.646***	-0.099***	-0.504***	-0.097***	-0.107***
Oman	-0.112*	-0.400**	-0.138*	-0.226*	-0.308**	-0.154**
Qatar	-0.149**	-0.315**	-0.116	-0.226*	-0.140	-0.227**
Saudi Arabia	-0.133**	-0.369**	-0.185**	-0.167	-0.271**	-0.192**
Syria	-0.067	-0.231**	-0.034	-0.380*	-0.039	-0.044
United Arab Emirates	-0.206***	-0.263*	-0.244**	-0.265**	-0.274**	-0.385***
Egypt	-0.163**	-0.584***	-0.092	-0.574***	-0.064	-0.081
Brunei Darussalam	-0.233***	-0.107	-0.296**	-0.910***	-0.239**	-0.317***
Sri Lanka	-0.066	-0.199*	-0.195***	-0.971***	-0.191**	-0.229***
India	-0.029	-0.259***	-0.122***	-0.318***	-0.101*	-0.149***
Indonesia	-0.229***	-0.260***	-0.218***	-0.325***	-0.243***	-0.265***
Timor-Leste	-0.621**	-0.846***	-0.796***	-0.506*	-0.419**	-0.392***
Malaysia	-0.214***	-0.327***	-0.308***	-0.431***	-0.341***	-0.241***
Maldives	-0.094	-0.329**	-0.215**	-0.254*	-0.294**	-0.183**
Pakistan	-0.332***	-0.200**	-0.381***	-0.398***	-0.256***	-0.234***
Philippines	-0.098***	-0.080	-0.126***	-0.251*	-0.101**	-0.164***
Thailand	-0.063	-0.167***	-0.155*	-0.352***	-0.185***	-0.174***
Algeria	-0.010	-0.307***	-0.012	-0.317***	0.005	-0.045
Angola	0.084***	-0.064*	0.071***	-0.064*	0.071**	0.068**
Botswana	-0.204**	-0.231**	-0.416***	-0.334**	-0.269**	-0.304***
Cabo Verde	-0.045	-0.135	-0.356***	-0.216	-0.339***	-0.307***
Equatorial Guinea	-0.081	-0.235	-0.486***	-0.285*	-0.352***	-0.371***
Gabon	-0.168**	-0.250**	-0.410***	-0.269*	-0.279**	-0.256***
Libya	-0.008	-0.063	-0.018	-0.060	-0.008	-0.104
Mauritius	-0.065	-0.241*	-0.443***	-0.644***	-0.382***	-0.262***
Morocco	-0.063	-0.246*	-0.351***	-0.269	-0.375***	-0.289***
Seychelles	-0.059	-0.196*	-0.042	-0.138	-0.048	-0.122
Namibia	-0.270**	-0.192*	-0.272*	-0.267*	-0.226*	-0.176
Swaziland	-0.144	-0.176*	-0.242**	-0.294**	-0.207**	-0.203***
Tunisia	-0.086	-0.167	-0.331***	-0.239	-0.393***	-0.289***
Fiji	-0.093	-0.278*	-0.235**	-0.441**	-0.252**	-0.200***
Vanuatu	-0.098*	-0.276**	-0.365***	-0.383**	-0.418***	-0.284***
Samoa	-0.030	-0.160	-0.225***	-0.547***	-0.234***	-0.270***

Tonga	-0.175	-0.153	-0.303**	-0.810***	-0.236*	-0.175**
Marshall Islands	-0.261	-0.520**	-0.429*	-0.394**	-0.349**	-0.221*
Micronesia	-0.172	-0.615***	-0.609***	-0.492***	-0.439***	-0.149**
Armenia	-0.556***	-0.529***	-0.571***	-0.540***	-0.538***	-0.546***
Azerbaijan	-0.319***	-0.340***	-0.378***	-0.359***	-0.356***	-0.364***
Belarus	-0.174***	-0.163***	-0.179***	-0.173***	-0.171***	-0.180***
Albania	0.054	-0.422***	0.028	-0.500***	0.043	-0.011
Georgia	-0.139	-0.317**	-0.223	-0.495**	-0.274*	-0.338*
Kazakhstan	-0.334***	-0.347***	-0.405***	-0.367***	-0.374***	-0.383***
Bulgaria	-0.019	-0.397***	-0.028	-0.410***	-0.025	-0.039
Russia	-0.200***	-0.187***	-0.198***	-0.194***	-0.199***	-0.201***
China	-0.016	-0.231**	-0.101**	-0.299**	-0.069*	-0.115***
Turkmenistan	-0.150**	-0.149**	-0.150**	-0.150**	-0.154**	-0.165**
Ukraine	-0.258***	-0.292***	-0.303***	-0.300***	-0.302***	-0.334***
Serbia	-0.189**	-0.193**	-0.214*	-0.201*	-0.200*	-0.226*
Montenegro, Rep. of	-0.130	-0.171	-0.245	-0.271	-0.147	-0.101
Hungary	0.023	-0.035	-0.022	-0.070	0.021	-0.086*
Croatia	-0.735***	-0.667***	-0.786***	-0.694***	-0.714***	-0.710***
Macedonia, FYR	-0.592***	-0.539***	-0.665***	-0.571***	-0.597***	-0.617***
Bosnia and Herzegovina	-0.235	-0.570**	-0.635***	-0.448*	-0.528**	-0.386
Poland	0.006	-0.194***	-0.032	-0.239**	-0.024	-0.041
Kosovo	-0.185	-0.162	-0.193	-0.252	-0.131	-0.105
Romania	0.028*	-0.136***	0.021	-0.139***	0.024	0.011
# significant	49	73	63	71	64	70
Share significant	54%	80%	69%	78%	70%	77%

Note: *, **, *** denote statistical significance at the 10, 5 and 1 percent levels, respectively.

Table 4.b Error correction model: adjustment term, Low-Income Countries

Country	Total expenditure	Wages and salaries	Goods and services	Capital	Non-interest	Interest payments
Bolivia	-0.010	-0.124**	-0.080	-0.373***	-0.080	-0.088*
Haiti	-0.007	-0.153***	-0.010	-0.183***	0.000	-0.051
Honduras	-0.053	-0.144***	-0.036	-0.207***	-0.020	-0.037
Nicaragua	0.009	-0.680***	0.009	-0.745***	0.010	0.005
Yemen	-0.067	-0.135	-0.135	-0.169	-0.141	-0.137
Afghanistan	-0.307	-0.785**	-0.605	-0.537	-0.548	-0.627
Bangladesh	-0.066**	-0.244*	-0.292***	-0.593***	-0.377***	-0.279***
Bhutan	-0.079	-0.221***	-0.211***	-0.332***	-0.166***	-0.195***
Myanmar	-0.366**	-0.396**	-0.397**	-0.562**	-0.388**	-0.413**
Cambodia	-0.102	-0.184**	-0.145	-0.273**	-0.106	-0.127
Lao P.D.R.	-0.019	-0.086	-0.076*	-0.112*	-0.069	-0.092**
Nepal	-0.058	-0.271***	-0.109*	-0.387***	-0.089	-0.115**
Vietnam	-0.010	-0.651***	-0.033	-0.435***	-0.030	-0.043
Djibouti	-0.282	-0.315*	-0.273**	-0.326**	-0.357***	-0.155*
Burundi	0.004	-0.020	0.006	-0.024	0.012	-0.043
Cameroon	-0.133	-0.529***	-0.279***	-0.748***	-0.214**	-0.244***
Central African Republic	-0.156*	-0.194*	-0.323**	-0.229*	-0.189*	-0.234***
Chad	-0.090	-0.206*	-0.366***	-0.277**	-0.222**	-0.307***
Comoros	-0.171**	-0.152	-0.447***	-0.238*	-0.289***	-0.342***
Congo, Republic of	-0.175**	-0.169*	-0.387***	-0.228*	-0.254**	-0.302***
Congo, Democratic Republic of the	0.005	-0.153***	-0.002	-0.153***	-0.003	-0.006
Benin	-0.158**	-0.179	-0.357***	-0.200	-0.238**	-0.245***
Eritrea	-0.125*	-0.167**	-0.193*	-0.212*	-0.205**	-0.633***
Ethiopia	-0.037	-0.251***	-0.097	-0.275***	-0.074	-0.153*
Gambia, The	-0.220***	-0.264*	-0.252***	-0.428***	-0.280***	-0.239***
Ghana	0.011	-0.109**	-0.122***	-0.130**	-0.111**	-0.134***
Guinea-Bissau	-0.237**	-0.192*	-0.306***	-0.231*	-0.242**	-0.282***
Guinea	-0.041	-0.241*	-0.120	-0.197	-0.142*	-0.148**
Côte d'Ivoire	-0.280***	-0.232*	-0.403***	-0.257*	-0.266**	-0.280***
Kenya	-0.122***	-0.260***	-0.209***	-0.363***	-0.183***	-0.207***
Lesotho	-0.060	-0.345***	-0.270***	-0.478***	-0.291***	-0.235***
Liberia	-0.555***	-0.885***	-0.945***	-0.889***	-0.540**	-0.434***
Madagascar	0.025	-0.149	-0.091**	-0.251*	-0.065	-0.114**
Malawi	-0.023	-0.071	-0.030	-0.084	-0.027	-0.062
Mali	-0.105	-0.223**	-0.341***	-0.280**	-0.200*	-0.259***
Mauritania	-0.100	-0.097	-0.162	-0.200*	-0.140*	-0.205**
Mozambique	0.011	-0.175***	-0.064	-0.210***	-0.063	-0.079*
Niger	-0.154**	-0.240**	-0.371***	-0.290**	-0.246**	-0.350***
Nigeria	-0.124	-0.087	-0.145	-0.199	-0.141	-0.179
Zimbabwe	-0.153	-0.840***	-0.888***	-0.784***	-0.456*	-0.240**
Rwanda	0.025	-0.199***	0.017	-0.273***	0.014	-0.063

São Tomé and Príncipe	0.009	-0.140**	-0.014	-0.151**	-0.011	-0.035
Senegal	-0.138*	-0.162	-0.372***	-0.225	-0.249**	-0.307***
Sierra Leone	-0.012	-0.141***	-0.058***	-0.156***	-0.054***	-0.068***
Sudan	0.020	-0.062	0.011	-0.059	0.017	0.004
South Sudan	-0.378	-8.199	-5.798	-10.374	-18.490	26.574
Tanzania	0.004	-0.133*	-0.044	-0.182*	-0.037	-0.060*
Togo	-0.117*	-0.244**	-0.391***	-0.296**	-0.251**	-0.316***
Uganda	0.034	-0.607***	-0.043	-0.648***	-0.040	-0.052**
Burkina Faso	-0.142*	-0.180	-0.357***	-0.223*	-0.240**	-0.298***
Zambia	0.015	-0.189***	-0.020	-0.211***	-0.017	-0.029
Solomon Islands	0.017	-0.073	-0.024	-0.109	-0.036	-0.148***
Papua New Guinea	-0.091*	-0.155**	-0.110*	-0.202**	-0.105*	-0.174***
Kyrgyz Republic	-0.574***	-0.558***	-0.610***	-0.617***	-0.596***	-0.643***
Moldova	-0.426***	-0.438***	-0.473***	-0.488***	-0.469***	-0.556***
Tajikistan	-0.169***	-0.176***	-0.205***	-0.185***	-0.206***	-0.212***
Uzbekistan	-0.130***	-0.119***	-0.134***	-0.141***	-0.132***	-0.144***
Mongolia	0.007	-0.219***	-0.002	-0.231***	0.004	-0.013
# significant	20	44	33	47	32	41
Share significant	34%	76%	57%	81%	55%	71%

Note: *, **, *** denote statistical significance at the 10, 5 and 1 percent levels, respectively.

Table 5.a Error correction model: Long-Run Coefficient, Emerging Market Economies

Country	Total expenditure	Wages and salaries	Goods and services	Capital	Non-interest	Interest payments
Turkey	-10.119	-1.358	-4.952	-0.623	-6.973	-4.342
South Africa	2.668***	1.364*	1.725***	1.314**	1.763**	0.679
Argentina	258.836	6.814	-27.061	4.032	-28.601	-23.247
Brazil	-152.428	-2.240	-189.550	-2.207	-223.431	-147.392
Chile	-2.098	-0.207	-3.680	-0.177	-3.888	-1.522
Colombia	-1.466	0.755	-0.439	0.779**	-0.228	-0.409
Costa Rica	-3.148	-0.240	1.351***	0.779**	1.453***	0.778***
Dominican Republic	1.389	1.204***	1.616	1.057***	1.562	0.843
Ecuador	-0.133	0.039	-0.349**	-0.058	-0.187*	-1.015***
El Salvador	-0.079	-0.051	-0.408***	-0.399	-0.256***	-1.161***
Guatemala	-0.605	0.213	-0.445	0.072	-0.433	-1.667
Mexico	0.596	-4.751	-3.447	-7.833	-4.204	-3.690
Panama	-0.120	0.028	-0.203*	-0.066	-0.094	-0.650***
Paraguay	1.846**	0.505	-2.231	0.722	-2.411	-1.216
Peru	55.139	-0.032	-31.523	-0.159	-36.142	-24.743
Uruguay	-110.070	0.179	-10.923	0.381	-11.874	-6.417
Venezuela	7.870***	6.360	-14.807	8.446	38.602	8.578
Antigua and Barbuda	-0.407	-0.067	-0.323***	-0.503**	-0.264***	-1.061***
Bahamas, The	-0.412	-0.030	-0.591***	-0.775***	-0.438***	-1.752***
Barbados	-0.129	-0.076	-0.700*	-0.805**	-0.617***	-2.604***
Dominica	-0.447	0.001	-0.573***	-0.343	-0.366***	-1.634***
Grenada	-0.343	-0.054	-0.361***	-0.469***	-0.273***	-1.101***
Guyana	35.159	0.559***	1,318.369	0.293***	287.434	-15.151
Belize	-0.140	-0.167	-0.206***	-0.419***	-0.154***	-0.648***
Jamaica	6.460	4.795**	6.496***	3.678*	6.766***	4.828***
St. Kitts and Nevis	-0.394	-0.024	-0.278***	-0.447***	-0.216***	-1.046***
St. Lucia	-0.191	-0.037	-0.313**	-0.463	-0.273***	-1.283***
St. Vincent and the Grenadines	-0.251	-0.069	-0.406***	-0.546***	-0.282***	-1.228***
Suriname	15.041***	-50.0514	19.035*	-13.586	18.103**	22.111
Trinidad and Tobago	-0.319	-0.883	-0.270	-0.217	-0.602	-0.618**
Bahrain	-0.069	0.005	-0.232**	-0.194	-0.157***	-0.708***
Iran	7.701*	3.443***	5.560***	3.178***	5.674***	4.817***
Iraq	-0.303***	-0.384***	-0.388***	-0.395***	-0.413***	-0.599***
Jordan	-0.026	-0.003	-0.103	-0.093	-0.099	-0.521***
Kuwait	-0.080	-0.012	-0.280***	-0.162	-0.204***	-0.778***
Lebanon	-4.132	-0.131*	0.843	-0.447***	0.908	0.289
Oman	-0.016	0.026	-0.234	-0.178	-0.154***	-0.945***
Qatar	0.003	0.007	-0.036	-0.045	-0.035	-0.350***
Saudi Arabia	0.104	0.028	-0.348**	0.106	-0.148*	-0.997***
Syria	1.702	-0.005	-3.889	0.008	-2.258	-4.218
United Arab Emirates	-0.042	-0.031	-0.241***	-0.229*	-0.135***	-0.717***
Egypt	1.505***	0.740***	0.851	0.461***	0.692	-0.202
Brunei Darussalam	-0.901***	-1.761	-1.398***	-1.474***	-0.971***	-2.709***
Sri Lanka	0.723	0.750***	0.764***	0.659***	0.840***	0.304**
India	0.802	0.437***	0.641***	0.266**	0.718***	0.167
Indonesia	1.321***	1.505***	1.216***	1.336***	1.329***	0.857***

Timor-Leste	0.139***	0.077**	0.058	0.134	0.044	0.007
Malaysia	0.142**	0.042	-0.010	-0.160*	0.054	-0.424***
Maldives	0.123	0.162**	0.137*	0.019	0.186***	-0.219*
Pakistan	1.273***	1.096***	1.121***	1.025***	1.130***	0.500**
Philippines	1.012***	0.830	0.703*	0.573*	0.741*	-0.017
Thailand	-0.486	-0.513	-0.388	-0.361**	-0.222	-0.816***
Algeria	-0.220	0.364	-7.939	0.237	26.960	-2.400
Angola	18.314***	-14.419	22.157***	-14.110	22.290***	22.723***
Botswana	0.863***	1.170***	0.862***	1.007***	0.837***	0.394**
Cabo Verde	-0.613	-0.278	-0.125	-0.297	-0.061	-0.518***
Equatorial Guinea	-0.035	-0.016	0.026	-0.046	0.031	-0.092**
Gabon	1.043*	0.5838	0.323	0.191	0.439	-0.869
Libya	2.957	-1.106	-3.319	-0.467	-5.848	-0.454
Mauritius	0.204	0.403	0.424***	0.324***	0.415***	-0.222
Morocco	0.012	-0.131	-0.317**	-0.292	-0.235**	-0.944***
Seychelles	0.404	2.010***	1.855	2.127*	2.112	-0.120
Namibia	1.310***	1.260**	1.198***	1.066***	1.113***	0.588
Swaziland	1.464***	1.460**	0.889**	1.218***	0.848**	0.189
Tunisia	0.854***	0.325	0.307***	0.289	0.398***	-0.271
Fiji	0.369	0.519	0.047	-0.142	0.254	-1.118**
Vanuatu	0.088	-0.325	-0.551***	-0.668**	-0.426***	-1.419***
Samoa	-3.170	-0.661	-0.524*	-0.600***	-0.367	-1.303***
Tonga	0.383	0.930	0.314	0.538**	0.257	-0.998
Marshall Islands	0.320	-0.014	0.132	0.062	-0.094	-0.589
Micronesia	-0.086	-0.826**	-0.562*	-2.223**	-1.269***	-2.760
Armenia	-0.007	-0.248	-0.194	-0.354	-0.284	-0.716
Azerbaijan	-0.079	-0.266	-0.199	-0.266	-0.260	-0.488*
Belarus	1.880	1.497	2.063	1.837	1.732	1.590
Albania	4.793*	-0.404	9.441	-0.522*	6.915	-24.842
Georgia	0.181	-0.084	0.103	-0.092	-0.104	-0.535**
Kazakhstan	0.659**	0.314	0.371	0.303	0.298	-0.043
Bulgaria	-18.312	-0.063	-18.044	-0.087	-22.454	-14.267
Russia	0.307	-0.115	0.193	0.042	0.022	-0.498
China	-0.841	-0.245	-0.305	-0.258**	-0.481	-0.576*
Turkmenistan	-0.406	-0.361	-0.269	-0.273	-0.325	-0.318
Ukraine	1.475	0.929	1.132	0.954	0.963	0.284
Serbia	-1.412	-1.697	-1.282	-1.306	-1.655	-1.495
Montenegro, Rep. of	1.301	0.661	0.313	0.228	1.079	3.032
Hungary	5.887	-7.877	-7.936	-2.622	14.786	-2.971
Croatia	-0.505*	-0.897***	-0.763***	-1.333***	-0.954***	-2.151***
Macedonia, FYR	0.114	-0.279	-0.250	-0.416*	-0.347	-1.346***
Bosnia and Herzegovina	-0.474	-0.925***	-0.949***	-0.924**	-1.008***	-1.569***
Poland	42.013	-0.300	-7.001	-0.294	-10.919	-6.831
Kosovo	0.901	1.034	0.919	0.598	1.621	3.115
Romania	27.974**	-2.517	52.033	-2.204	48.872	102.327
# significant	22	21	40	40	40	45
# significant and positive	20	16	16	19	17	8
Share significant	24%	23%	44%	44%	44%	49%
Share of significant and positive	22%	18%	18%	21%	19%	9%

Note: *, **, *** denote statistical significance at the 10, 5 and 1 percent levels, respectively.

Table 5.b Error correction model: Long-Run Coefficient, Low-Income Countries

Country	Total expenditure	Wages and salaries	Goods and services	Capital	Non-interest	Interest payments
Bolivia	-19.900	-0.317	-2.953	0.207	-2.871	-3.367
Haiti	8.413	2.893	24.743	3.108*	429.960	1.429
Honduras	1.722**	0.116	0.728	0.408	0.372	-1.098
Nicaragua	195.658	1.711***	140.840	1.378***	125.867	261.428
Yemen	-1.736	0.815	0.984	1.363	0.861	0.076
Afghanistan	0.395**	0.219***	0.232**	0.351***	0.215**	0.054
Bangladesh	0.138	0.635***	0.397***	0.490***	0.546***	-0.077
Bhutan	0.674***	0.329**	0.447***	0.301***	0.446***	0.036
Myanmar	0.942***	0.877**	0.960***	0.898***	0.853**	0.683**
Cambodia	0.155	-0.122	0.212	0.019	0.068	-0.136
Lao P.D.R.	-6.144	2.541**	0.169	2.513**	0.030	-0.022
Nepal	0.872	0.514**	0.612	0.367*	0.656	-0.165
Vietnam	-17.845	0.404***	-11.736	0.110	-13.157	-8.864
Djibouti	0.219	0.078	0.292	0.326	0.187*	0.905
Burundi	7.806	-8.578	21.966	-4.686	10.267	-1.045
Cameroon	0.580	-0.460*	-0.147	-0.636***	-0.370	-1.240**
Central African Republic	1.156*	-0.494	0.148	-0.622	0.023	-1.349
Chad	0.194	-0.153	-0.001	-0.168	-0.011	-0.402**
Comoros	0.397	-0.273	-0.435	-0.549	-0.509	-1.819***
Congo, Republic of	0.506**	0.236	0.070	0.090	0.057	-0.556*
Congo, Democratic Republic of the	117.542	-5.177	-104.100	-4.844	-113.914	-50.064
Benin	0.637**	-0.273	0.177	-0.351	0.272	-0.369
Eritrea	-1.738	-1.598	-1.121	-1.153	-1.018	0.149
Ethiopia	1.080	0.510*	0.896*	0.458*	0.819	0.442
Gambia, The	2.177***	2.183***	1.912***	1.846***	2.021***	1.119***
Ghana	22.152	3.068***	1.473	3.115***	1.376	1.179
Guinea-Bissau	0.514	0.447	0.192	0.234	0.301	-0.695
Guinea	3.719***	3.321***	2.055*	3.007***	2.474***	1.446
Côte d'Ivoire	1.090***	-0.058	0.370	-0.552	0.286	-1.276*
Kenya	1.497***	0.708	1.368***	0.422	1.428***	0.624
Lesotho	1.573**	1.368***	1.225***	1.068***	1.317***	0.571*
Liberia	0.189***	0.102***	0.082**	0.202***	0.076	0.028
Madagascar	8.473*	1.449	1.482	1.736**	0.772	0.546
Malawi	8.136	2.729	6.591*	3.320*	6.709	4.201***
Mali	0.573	-0.155	0.082	-0.248	0.140	-0.481*
Mauritania	0.521	0.022	0.624	0.481	0.274	-0.055
Mozambique	13.472	0.213	-1.434	0.340	-1.457	-1.229
Niger	0.710**	-0.307	0.027	-0.354	0.070	-0.675**
Nigeria	1.090	0.403	0.925	1.023	0.774	0.655
Zimbabwe	-0.346	0.047	0.053*	0.150	0.046	0.168
Rwanda	2.841	0.113	5.130	0.259	7.344	-0.918
São Tomé and Príncipe	19.434	0.452	-25.660	0.692	-33.005	-8.060
Senegal	0.602	-0.151	0.085	-0.211	0.047	-0.663**
Sierra Leone	6.102	0.581	0.540	0.733	0.506	1.122
Sudan	6.637	-4.649	37.392	-4.766	26.155	111.000
South Sudan	-27.192	-0.186	-0.013	0.118	0.090	-0.305
Tanzania	25.633	1.080**	-2.401	1.262**	-2.575	-1.131
Togo	0.633	-0.738	-0.011	-0.748	-0.023	-1.126**
Uganda	9.944**	0.642***	-4.320	0.457***	-4.718	-3.710
Burkina Faso	0.286	-0.187	0.063	-0.212	0.054	-0.438**
Zambia	11.193	0.725	-3.179	0.784	-6.197	-1.551
Solomon Islands	5.568	-0.692	-4.100	0.162	-1.440	0.028
Papua New Guinea	1.380***	0.452	0.784	0.441	0.998*	0.208
Kyrgyz Republic	1.395***	1.162***	1.242***	1.044***	1.132***	0.430
Moldova	1.088***	0.731*	0.825*	0.670*	0.683*	0.067
Tajikistan	-0.003	-0.394	-0.028	-0.203	-0.134	-0.238
Uzbekistan	2.991***	4.394**	3.996**	3.839***	3.884***	4.068***
Mongolia	3.774	0.111	13.630	0.162	-2.464	0.791
# significant	20	20	14	22	13	14
# significant and positive	20	19	14	21	13	5
Share significant	34%	34%	24%	38%	22%	24%
Share of significant and positive	34%	33%	24%	36%	22%	9%

Note: *, **, *** denote statistical significance at the 10, 5 and 1 percent levels, respectively.

Table 6.a Error correction model: Short-Run Coefficient, Emerging Market Economies

Country	Total expenditure	Wages and salaries	Goods and services	Capital	Non-interest	Interest payments
Turkey	-3.602***	-2.624***	-2.911***	-2.752***	-3.033***	-2.944***
South Africa	-1.133	-0.360	-0.430	-1.140	-0.343	-0.657
Argentina	-8.535***	-2.777**	-6.317***	-2.775**	-6.369***	-6.407***
Brazil	-9.682**	1.445	-4.841	1.260	-4.780	-4.580
Chile	-3.373***	-3.003***	-1.470***	-2.829***	-1.344***	-1.150*
Colombia	-2.016***	-2.974***	-1.745*	-3.033***	-2.194***	-1.826*
Costa Rica	-3.329***	-2.029***	-1.102*	-1.299*	-1.503**	-1.458**
Dominican Republic	-3.280***	-2.823***	-3.635***	-2.632***	-3.254***	-3.086**
Ecuador	-0.144	-0.305	-0.015	-0.204	-0.220	-0.904**
El Salvador	-0.492*	-0.452	-0.205	0.034	-0.484**	-0.228
Guatemala	-1.000	-1.997**	0.524	-1.799	0.664	-0.783
Mexico	-5.271	-3.854***	-4.258***	-4.123***	-4.961***	-5.052***
Panama	0.082	-0.435	-0.043	-0.231	-0.040	-0.347
Paraguay	-1.122*	-1.482***	-0.735	-1.386**	-0.628	-0.553
Peru	-10.558***	-0.925*	-10.123***	-1.243**	-9.929***	-9.931***
Uruguay	-0.983	-1.654***	-0.890	-1.190**	-0.909	-0.850
Venezuela	-2.981***	-1.622**	-1.471**	-1.288*	-1.404**	-1.969***
Antigua and Barbuda	-0.230	-0.319**	0.076	-0.701***	-0.255**	0.069
Bahamas, The	-0.189	0.358	-0.328	-0.134	-0.082	0.031
Barbados	0.063	0.018	-0.247	-1.089**	-0.388**	0.236
Dominica	-0.076	-0.517	-0.517*	-0.783	-0.378*	-0.915*
Grenada	-0.065	0.039	-0.238	-0.442	-0.198	-0.154
Guyana	-0.289	-0.652*	-0.440	0.565	-0.095	-0.012
Belize	-0.009	-0.956***	-0.011	-1.258***	-0.258***	-0.178
Jamaica	0.069	0.725	-0.433	0.307	-0.554	-0.263
St. Kitts and Nevis	-0.396	-0.182	0.104	-0.299	-0.101	-0.501
St. Lucia	0.306	-0.324	0.117	-0.388	-0.240	-0.115
St. Vincent and the Grenadines	0.170	-0.365	-0.377	-0.887	-0.522***	-0.827*
Suriname	-2.219**	-2.324	-2.520*	-1.595	-2.538*	-2.505*
Trinidad and Tobago	-0.295	-0.735**	-0.443	-0.837**	-0.245	-0.438
Bahrain	-0.323*	-1.510***	-0.224	-1.488**	-0.242	-1.369**
Iran	0.327	-0.743	1.068	-1.546	1.065	0.861
Iraq	-0.137	-0.145	-0.252**	-0.282*	-0.227**	-0.155
Jordan	-0.077	-0.748**	-1.021***	0.153	-0.729**	-1.528***
Kuwait	-0.037	-0.075	-0.025	0.003	-0.027	-0.016
Lebanon	0.013	-0.928***	0.109	-0.649	0.183	0.115
Oman	0.067	-0.320	0.130	0.341	-0.079	-0.127
Qatar	-0.054	-0.140	-0.099	-0.144	-0.069	-0.385**
Saudi Arabia	-0.009	-0.304	-0.131	-0.609*	-0.215***	-0.540***
Syria	0.585	-0.594	0.657	-0.530	0.829	0.273
United Arab Emirates	-0.325***	-0.418*	-0.077	-1.064***	-0.251***	-0.226
Egypt	-2.380***	-1.587	-3.957***	-3.157***	-4.204***	-3.696***
Brunei Darussalam	-1.171***	-1.287*	-1.259**	-0.508	-0.984**	-0.877
Sri Lanka	-0.349	-0.337	-0.422	-0.339	-0.401	0.024
India	-0.908*	-2.066**	-1.966***	-1.277	-2.017***	-1.799*
Indonesia	-4.499***	-5.138***	-4.571***	-5.148***	-4.674***	-4.550***
Timor-Leste	0.172**	0.043	0.144	0.442**	0.206***	-0.204
Malaysia	-1.539***	-2.075***	-1.463***	-2.204***	-1.486***	-1.340***
Maldives	-0.433	-0.141	-0.189	-0.478*	-0.091	0.129
Pakistan	-0.606	-2.413***	-1.831***	-2.535***	-1.524**	-1.798*
Philippines	-1.891***	-2.481**	-2.008***	-2.604***	-1.895***	-1.989***
Thailand	-1.491***	-2.025***	-1.544***	-2.047***	-1.633***	-1.535***
Algeria	-1.512**	1.247	-2.699***	0.144	-2.957***	-1.795
Angola	-4.072**	-0.085	-4.146*	-0.171	-4.062*	-4.087*
Botswana	-0.143	-0.093	-0.176	-0.184	-0.134	-0.453
Cabo Verde	0.043	-0.325	0.209	-0.558	0.755	0.925
Equatorial Guinea	0.071	0.085	0.256*	0.068	0.232*	0.220
Gabon	0.074	0.059	0.451	-0.124	0.283	0.424
Libya	0.047	-0.004	0.040	-0.001	0.039	0.001
Mauritius	-1.420***	-2.538**	-0.941	-2.805**	-1.833**	-1.987**
Morocco	0.041	0.037	0.214	-0.312	-0.130	-0.340
Seychelles	-0.404	-0.443	-0.028	-0.266	-0.346	-0.366
Namibia	-0.641	-1.592	-1.337	-1.399	-1.403	-2.284*
Swaziland	-0.113	-4.315*	-0.958	-3.839	-1.260*	-1.172
Tunisia	0.012	-1.718**	-0.520	-1.143	-0.503	-0.829
Fiji	-0.594*	-0.280	-0.186	0.484	-0.305	-0.372
Vanuatu	-0.352	-0.999**	-0.357	-1.353*	-0.884**	-0.846*
Samoa	-0.247	-0.441	0.007	-0.551	0.151	0.612
Tonga	0.106	1.386**	0.147	1.249*	0.086	-0.106

Marshall Islands	-0.115	0.067	0.418	0.458	0.205	0.288
Micronesia	0.012	-0.341	0.007	-0.999	-0.355*	-0.191
Armenia	3.519*	3.548*	3.620*	3.174	3.378*	3.126
Azerbaijan	-1.691**	-1.462*	-1.205*	-1.460*	-1.363*	-1.731**
Belarus	-2.900*	-3.581**	-2.884	-3.382**	-3.240*	-3.595**
Albania	-2.268***	0.512	-1.940***	0.749	-2.046***	-1.455**
Georgia	-1.621***	-1.487**	-1.175	-1.478*	-1.488**	-1.595**
Kazakhstan	-2.096**	-1.860**	-1.090	-1.956**	-1.512*	-2.290***
Bulgaria	-6.912***	3.408	-6.806***	2.907	-7.034***	-6.768***
Russia	-4.364*	-4.653*	-4.379*	-4.786*	-4.386*	-4.829**
China	0.129	-0.325	0.351	0.203	0.506	0.573
Turkmenistan	-3.091*	-3.334*	-3.220*	-3.375*	-3.169*	-3.319*
Ukraine	-2.153***	-2.062***	-1.833***	-2.149***	-1.909***	-2.223***
Serbia	-1.018	-1.246	-0.865	-1.597	-1.264	-1.281
Montenegro, Rep. of	-1.006*	-1.121*	-0.904	-1.432*	-0.965	-1.036*
Hungary	-1.418***	-0.812	-0.783	-0.688	-1.253**	-0.532
Croatia	-1.340	-1.771**	-1.153	-2.436***	-1.774**	-1.875**
Macedonia, FYR	-1.583	-1.738*	-1.423	-2.701**	-1.638	-2.703**
Bosnia and Herzegovina	-0.412	-1.641	-1.979*	-1.068	-1.639	-1.382
Poland	-3.456***	0.900	-2.706*	1.048	-2.691*	-2.194
Kosovo	-0.843	-0.787	-0.163	-0.569	-0.405	-0.738
Romania	-4.395***	-1.979***	-4.662***	-2.169***	-4.683***	-4.096***

Note: *, **, *** denote statistical significance at the 10, 5 and 1 percent levels, respectively.

Table 6.b Error correction model: Short-Run Coefficient, Low-Income Countries

Country	Total expenditure	Wages and salaries	Goods and services	Capital	Non-interest	Interest payments
Bolivia	-16.500***	-0.252	-11.022	-1.128	-10.717	-10.660
Haiti	-0.550	-0.364	-1.259**	-0.332	-0.769	-0.819
Honduras	-0.832	-1.568***	-1.177	-1.803***	-1.182	-1.440*
Nicaragua	-6.888**	1.232	-23.430***	1.244	-23.178***	-22.657***
Yemen	-0.045	0.039	0.062	0.235	0.161	0.011
Afghanistan	0.025	0.001	0.075	0.330	0.057	-0.193
Bangladesh	0.530*	-1.211	1.056	-3.229	0.228	0.957
Bhutan	-0.466	-1.271*	-1.463***	-2.309***	-1.355***	-1.848***
Myanmar	3.347*	3.287	4.051*	3.629	3.424*	3.577*
Cambodia	-0.591	-2.199*	-0.717	-2.066	-0.509	-1.156
Lao P.D.R.	-2.655*	-14.819***	-2.881*	-15.313***	-3.014*	-2.375
Nepal	0.231	-0.459	0.361	-0.159	0.124	-0.393
Vietnam	-0.986	-2.930**	-14.426**	-3.778**	-14.158**	-12.955**
Djibouti	-0.115	-0.211	-0.468	-1.103*	-0.797***	-1.641***
Burundi	-0.109	-0.358	-0.173	-0.012	-0.496	-0.456
Cameroon	0.492	5.324**	0.816	5.813***	1.109**	1.020*
Central African Republic	0.405	0.366	0.335	0.307	0.318	0.248
Chad	-0.153	-0.318	-0.022	-0.330	-0.211	-0.339
Comoros	-1.078*	-1.743**	-1.128	-0.943	-1.023	-2.333***
Congo, Republic of	-0.387	-1.833*	-0.660	-1.704*	-0.700	-0.678
Congo, Democratic Republic of the	-13.531***	-1.678	-14.814***	-1.747	-14.741***	-14.307***
Benin	-0.872	-3.162	-1.318	-3.107	-1.478	-2.534*
Eritrea	-0.405	-0.212	-0.530	-0.362	-0.411	0.013
Ethiopia	0.574*	1.534***	0.723*	1.532***	0.782*	0.832*
Gambia, The	-0.146	0.166	-0.013	0.233	0.080	-0.076
Ghana	0.960	-3.114**	3.883**	-3.138**	3.557**	3.830**
Guinea-Bissau	-0.177	0.090	-0.085	0.180	-0.035	-0.323
Guinea	0.435	0.880	-0.636	0.481	-0.005	-0.445
Côte d'Ivoire	-0.278	0.535	-0.080	0.902	0.384	0.716
Kenya	-1.802***	-1.196	-2.675***	-0.445	-2.844***	-3.023***
Lesotho	0.277	-5.490***	-0.869	-5.281***	-2.204	-2.228
Liberia	0.052	-0.009	0.121*	0.242**	0.051	-0.289***
Madagascar	-0.885*	-0.407	-0.151	0.083	-0.494	-0.315
Malawi	-1.257**	-1.225	-1.506**	-1.306	-1.107*	-0.965
Mali	-0.613	0.658	-0.238	0.798	-0.662	-0.455
Mauritania	-0.419	-0.067	-0.181	0.384	0.111	0.234
Mozambique	1.268	-0.157	2.401**	-0.093	2.554***	2.434**
Niger	0.163	0.647	0.077	0.481	0.020	-0.154
Nigeria	-1.390	-1.735	-0.879	-0.606	-1.067	-1.178
Zimbabwe	0.010	0.209	0.275***	0.623***	0.130	0.005
Rwanda	0.185	0.532**	0.162	0.620***	0.272	0.225
São Tomé and Príncipe	-0.047	-0.429	1.486	-0.252	1.574	1.788
Senegal	-0.170	-1.884	-0.374	-1.430	0.064	-0.351
Sierra Leone	-0.578	-0.151	-0.405	-0.119	-0.499	-0.532
Sudan	-4.301**	-1.815	-2.575	-2.325*	-2.447	-2.753
South Sudan	-7.278	-1.292	-0.125	0.766	1.122	5.573
Tanzania	1.247	-1.495	2.390	-2.146	1.600	0.628
Togo	0.304	1.031**	0.389	0.897*	0.227	0.309
Uganda	-2.683	-1.330	-2.699	-1.698	-2.279	-2.633
Burkina Faso	0.396	-1.142	-0.348	-1.092	-0.133	-0.047
Zambia	-2.326**	-0.672	-2.632**	-0.364	-2.383**	-2.872***
Solomon Islands	-0.253	-0.134	-0.483**	0.102	-0.166	0.011
Papua New Guinea	-0.470	-1.149**	-0.537	-0.914	-0.387	-0.453
Kyrgyz Republic	0.845	0.981	0.831	0.891	1.045	0.570
Moldova	0.036	0.072	0.088	0.051	0.199	-0.300
Tajikistan	-0.474	-0.589	0.192	-0.488	0.136	-0.343
Uzbekistan	-9.400***	-11.637***	-10.259***	-10.126***	-10.437***	-11.437***
Mongolia	-5.257***	-0.803	-5.451***	-0.879	-5.578***	-5.013***

Note: *, **, *** denote statistical significance at the 10, 5 and 1 percent levels, respectively.

Table 7.a Determinants of Short-Run Expenditure Cyclicality, cross-country WLS regressions

Specification	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent variable	Exp_lr	Exp_lr	Exp_lr	Wage_lr	GS_lr	Capital_lr	Nonint_lr	Intpay_lr
Real GDP per capita	-0.544**	0.077	-0.288	-0.090	-0.066	-0.073	-0.074	-0.053
	(0.245)	(0.315)	(0.311)	(0.323)	(0.452)	(0.321)	(0.446)	(0.435)
Government size	-0.399***	-0.657***	-0.452***	-0.071	-0.327**	-0.112	-0.328**	-0.303**
	(0.076)	(0.095)	(0.103)	(0.106)	(0.149)	(0.106)	(0.147)	(0.143)
Trade openness	-0.009	-0.074	-0.714	-0.215	-0.371	-0.273	-0.277	-0.050
	(0.007)	(0.904)	(0.850)	(0.882)	(1.235)	(0.877)	(1.217)	(1.187)
Polity2			-0.018	0.002	0.036	-0.014	0.020	0.024
			(0.084)	(0.087)	(0.122)	(0.087)	(0.121)	(0.118)
Constraints on the executive			-0.027	-0.016	-0.031	-0.023	-0.034	-0.034
			(0.032)	(0.034)	(0.047)	(0.034)	(0.047)	(0.045)
Margin of majority			-1.199	0.712	-0.941	0.093	-0.962	-0.229
			(2.049)	(2.126)	(2.976)	(2.115)	(2.934)	(2.861)
Executive elections			-3.541	2.045	-1.122	1.353	-1.282	-2.056
			(3.450)	(3.580)	(5.010)	(3.561)	(4.940)	(4.817)
Proportional representation			0.243	0.774	0.620	0.980	0.561	0.529
			(0.600)	(0.623)	(0.871)	(0.619)	(0.859)	(0.838)
Checks and balances			0.033	0.179	0.050	0.261	0.086	0.173
			(0.421)	(0.437)	(0.612)	(0.435)	(0.603)	(0.588)
Durability of regime (in years)			0.004	0.005	-0.021	0.002	-0.022	-0.015
			(0.020)	(0.021)	(0.029)	(0.021)	(0.029)	(0.028)
Private credit (% GDP)		0.019						
		(0.117)						
Observations	140	82	103	103	103	103	103	103
R-squared	0.344	0.468	0.343	0.036	0.108	0.051	0.111	0.101

Note: dependent variable denotes the coefficient estimates for the long-run cyclicality. Suffix "_lr" denotes long-run. Cross sectional regression estimated with weighted least squares (WLS) with weights given by the inverse of the standard errors of the estimated coefficients. Standard errors in parenthesis. Constant term omitted for reasons of parsimony. *, **, *** denote statistical significance at the 10, 5 and 1 percent levels, respectively.

Table 7.b Determinants of Long-Run Expenditure Cyclicality, cross-country WLS regressions

Specification	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent variable	Exp_lr	Exp_lr	Exp_lr	Wage_lr	GS_lr	Capital_lr	Nonint_lr	Intpay_lr
Real GDP per capita	0.222	-4.197	0.956	-0.099	-2.679	0.112	8.622	2.791
	(4.045)	(6.081)	(5.217)	(0.710)	(17.413)	(0.323)	(7.234)	(4.529)
Government size	-0.061	1.819	-0.903	-0.400*	-5.953	-0.336***	-9.430***	-3.100**
	(1.248)	(1.829)	(1.719)	(0.234)	(5.737)	(0.106)	(2.383)	(1.492)
Trade openness	-0.029	-0.422	-6.456	-1.439	-3.783	-1.090	-22.344	-6.865
	(0.110)	(17.445)	(14.248)	(1.939)	(47.555)	(0.881)	(19.757)	(12.368)
Polity2			-0.584*	-0.057	0.915	0.035	-1.616	-0.600
			(0.333)	(0.192)	(4.716)	(0.087)	(1.959)	(1.226)
Constraints on the executive			0.028	-0.018	1.648	0.014	-0.787	-0.146
			(0.545)	(0.074)	(1.818)	(0.034)	(0.755)	(0.473)
Margin of majority			-23.472	-1.600	-89.413	-1.190	-39.908	3.002
			(34.342)	(4.674)	(114.625)	(2.124)	(47.621)	(29.812)
Executive elections			6.047	5.618*	4.548**	6.633*	33.844	17.276
			(57.822)	(7.870)	(192.996)	(3.576)	(80.180)	(50.195)
Proportional representation			6.119	-2.934**	49.392	-1.739***	7.135	3.786
			(10.056)	(1.369)	(33.566)	(0.622)	(13.945)	(8.730)
Checks and balances			0.721	0.731	-16.324	0.221	6.643	3.312
			(7.059)	(0.961)	(23.560)	(0.437)	(9.788)	(6.128)
Durability of regime (in years)			-0.099	0.055	-0.986	0.025	-0.306	-0.064
			(0.340)	(0.046)	(1.135)	(0.021)	(0.471)	(0.295)
Private credit (% GDP)		-0.124						
		(0.278)						
Observations	140	82	103	103	103	103	103	103
R-squared	0.001	0.020	0.018	0.131	0.087	0.217	0.168	0.050

Note: dependent variable denotes the coefficient estimates for the long-run cyclicality. Suffix "_lr" denotes long-run. Cross sectional regression estimated with weighted least squares (WLS) with weights given by the inverse of the standard errors of the estimated coefficients. Standard errors in parenthesis. Constant term omitted for reasons of parsimony. *, **, *** denote statistical significance at the 10, 5 and 1 percent levels, respectively.

APPENDIX

List of countries

Emerging Market Economies:

Turkey, South Africa, Argentina, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Mexico, Panama, Paraguay, Peru, Uruguay, Venezuela, Antigua and Barbuda, Bahamas, Barbados, Dominica, Grenada, Guyana, Belize, Jamaica, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Trinidad and Tobago, Bahrain, Iran, Iraq, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, Syria, United Arab Emirates, Egypt, Brunei Darussalam, Sri Lanka, India, Indonesia, Timor-Leste, Malaysia, Maldives, Pakistan, Philippines, Thailand, Algeria, Angola, Botswana, Cabo Verde, Equatorial Guinea, Gabon, Libya, Mauritius, Morocco, Seychelles, Namibia, Swaziland, Tunisia, Fiji, Vanuatu, Samoa, Tonga, Marshall Islands, Micronesia, Armenia, Azerbaijan, Belarus, Albania, Georgia, Kazakhstan, Bulgaria, Russia, China, Turkmenistan, Ukraine, Serbia, Montenegro, Hungary, Croatia, Macedonia, Bosnia and Herzegovina, Poland, Kosovo, Romania

Low-Income Countries:

Bolivia, Haiti, Honduras, Nicaragua, Yemen, Afghanistan, Bangladesh, Bhutan, Myanmar, Cambodia, Lao P.D.R., Nepal, Vietnam, Djibouti, Burundi, Cameroon, Central African Republic, Chad, Comoros, Republic of Congo, Democratic Republic of Congo, Benin, Eritrea, Ethiopia, Gambia, Ghana, Guinea-Bissau, Guinea, Côte d'Ivoire, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mozambique, Niger, Nigeria, Zimbabwe, Rwanda, São Tomé and Príncipe, Senegal, Sierra Leone, Sudan, South Sudan, Tanzania, Togo, Uganda, Burkina Faso, Zambia, Solomon Islands, Papua New Guinea, Kyrgyz Republic, Moldova, Tajikistan, Uzbekistan, Mongolia

Table A1. Summary Statistics

Variable	Observations	Mean	Standard deviation	Minimum	Maximum
RGDP growth	6227	0.035	0.066	-1.02	0.906
Total government expenditure (% GDP)	8580	31.64	4.82	18.96	40.76
Expenditure on wages and salaries (% GDP)	4797	7.73	0.44	6.89	8.46
Expenditure on goods and services (% GDP)	6657	6.88	0.89	5.73	8.39
Capital expenditure (% GDP)	4797	2.33	0.34	1.86	2.94
Non-interest expenditure (% GDP)	6657	37.51	3.71	32.70	44.32
Interest payments (% GDP)	6657	3.22	0.98	2.01	5.04

Table A2. Endogeneity Test: Durbin-Wu-Hausman P-values

Country	Total expenditure
Turkey	0.84
South Africa	0.35
Argentina	**0.02**
Brazil	0.73
Chile	**0.09**
Colombia	0.47
Costa Rica	0.53
Dominican Republic	0.57
Ecuador	0.44
El Salvador	0.42
Guatemala	0.54
Mexico	**0.08**
Panama	**0.05**
Paraguay	**0.00**
Peru	0.60
Uruguay	0.83
Venezuela	0.65
Antigua and Barbuda	0.81
Bahamas, The	0.88
Barbados	0.16
Dominica	**0.03**
Grenada	0.65
Guyana	0.60
Belize	0.24
Jamaica	0.25
St. Kitts and Nevis	0.13
St. Lucia	0.81
St. Vincent and the Grenadines	0.51
Suriname	0.89
Trinidad and Tobago	0.39
Bahrain	0.16
Iran	**0.06**
Iraq	0.97
Jordan	**0.03**
Kuwait	0.77
Lebanon	0.66
Oman	0.54
Qatar	0.64
Saudi Arabia	0.78
Syria	0.85
United Arab Emirates	0.95
Egypt	0.24
Brunei Darussalam	0.56
Sri Lanka	0.48
India	**0.00**
Indonesia	
Timor-Leste	**0.07**
Malaysia	0.47
Maldives	0.59
Pakistan	**0.04**
Philippines	0.55
Thailand	**0.02**
Algeria	**0.03**
Angola	
Botswana	0.40
Cabo Verde	0.47
Equatorial Guinea	0.21
Gabon	0.74
Libya	0.89
Mauritius	0.23
Morocco	0.19
Seychelles	
Namibia	
Swaziland	0.13
Tunisia	**0.01**
Fiji	0.16
Vanuatu	0.30
Samoa	**0.01**
Tonga	
Marshall Islands	
Micronesia	**0.01**
Armenia	0.47
Azerbaijan	0.60
Belarus	**0.00**
Albania	0.33
Georgia	0.50
Kazakhstan	0.35
Bulgaria	0.92
Russia	0.50
China	0.85
Turkmenistan	0.67
Ukraine	
Serbia	
Montenegro, Rep. of	0.81
Hungary	0.17
Croatia	0.25
Macedonia, FYR	**0.01**
Bosnia and Herzegovina	0.19
Poland	
Kosovo	**0.02**
Romania	
Bolivia	0.29
Haiti	0.30
Honduras	0.39
Nicaragua	**0.00**
Yemen	0.15
Afghanistan	0.92
Bangladesh	0.32
Bhutan	
Myanmar	0.88
Cambodia	0.90
Lao P.D.R.	0.53
Nepal	0.21
Vietnam	**0.01**
Djibouti	0.23
Burundi	0.62
Cameroon	0.66
Central African Republic	
Chad	0.18
Comoros	0.38
Congo, Republic of	0.09
Congo, Democratic Republic of the	0.48
Benin	**0.00**
Eritrea	0.12
Ethiopia	
Gambia, The	0.71
Ghana	0.84
Guinea-Bissau	**0.00**
Guinea	0.65
Côte d'Ivoire	0.81
Kenya	0.74
Lesotho	0.65
Liberia	
Madagascar	0.49
Malawi	0.34
Mali	0.23
Mauritania	**0.05**
Mozambique	0.35
Niger	0.14
Nigeria	0.91
Zimbabwe	0.26
Rwanda	**0.01**
São Tomé and Príncipe	
Senegal	0.39
Sierra Leone	0.60
Sudan	0.61
South Sudan	**0.06**
Tanzania	
Togo	0.86
Uganda	**0.01**
Burkina Faso	0.33
Zambia	0.53
Solomon Islands	0.11
Papua New Guinea	**0.01**
Kyrgyz Republic	0.61
Moldova	0.44
Tajikistan	**0.01**
Uzbekistan	**0.00**
Mongolia	0.87

Table A3. Mean Group Regressions of total government expenditure - Before and after GFC

Dependent variable	*Government Expenditure*			
Time period	*Before GFC*		*After GFC*	
Country Group	*EME*	*LIC*	*EME*	*LIC*
Speed of adjustment	-0.161***	-0.132***	-0.541***	-0.638***
	(0.024)	(0.029)	(0.042)	(0.054)
Short run coefficient	-1.241***	-1.554***	-1.173***	-1.133***
	(0.289)	(0.506)	(0.206)	(0.366)
Long run coefficient	4.356**	14.781	1.572	0.579
	(1.780)	(17.561)	(1.621)	(0.537)
Observations	2,880	1,774	901	576

Note: Estimation of Equation (5). Standard errors in parenthesis. *, **, *** denote statistical significance at the 10, 5 and 1 percent levels, respectively.

Table A4. Mean Group Regressions of expenditure components - Before and after GFC

Dependent variable	*Wages and Salaries*		*Goods and Services*		*Capital expenditure*		*Non-interest expenditure*		*Interest payments*	
Time period	*before*	*after*	*before*	*after*	*before*	*after*	*before*	*after*	*before*	*after*
Country Group	*EME*	*LIC*	*EME*	*LIC*	*EME*	*LIC*	*EME*	*LIC*	*EME*	*LIC*
Speed of adjustment	-0.265***	-0.919***	-0.232***	-1.103***	-0.337***	-0.800***	-0.234***	-0.878***	-0.202***	-0.736***
	(0.021)	(0.080)	(0.021)	(0.072)	(0.054)	(0.086)	(0.020)	(0.128)	(0.017)	(0.190)
Short run coefficient	-0.988***	-1.302***	-1.361***	-0.857***	-0.845***	-1.440***	-1.468***	-1.215***	-1.468***	-1.282***
	(0.281)	(0.308)	(0.310)	(0.321)	(0.278)	(0.342)	(0.308)	(0.277)	(0.302)	(0.278)
Long run coefficient	-1.385	0.005	2.780	-1.305	-7.086	1.151	-0.033	-5.528	7.836	-0.468
	(1.144)	(1.009)	(3.265)	(1.469)	(5.964)	(0.912)	(3.941)	(5.666)	(10.033)	(0.854)
Observations	2,419	1,199	3,577	1,199	2,419	1,199	3,577	1,199	3,577	1,199

Note: Estimation of Equation (5). Standard errors in parenthesis. *, **, *** denote statistical significance at the 10, 5 and 1 percent levels, respectively.

Table A5. Pedroni (2004) Panel Cointegration Tests of real GDP with Government Expenditures

EME	**Statistic (no trend)**	**Government Expenditures**	**Wages and Salaries**	**Goods and services**	**Capital expenditure**	**Non-interest expenditure**	**Interest Payments**
Within dimension	Panel v	0.215	-0.415	0.098	-0.415	0.098	0.098
	Panel ρ	0.109	0.564	1.031	0.5647	1.031	1.031
	Panel PP	0.571	-0.507	0.995	-0.507	0.995	0.995
	Panel ADF	0.068	1.291	1.575	1.291	1.575	1.575
Between dimension	Panel ρ	1.361	1.226	1.989	1.226	1.989	1.989
	Panel PP	0.322	-1.251	0.683	-1.251	0.683	0.683
	Panel ADF	-1.466	-1.888*	-0.403	-1.888*	-0.403	-0.403
LIC	**Statistic (no trend)**	**Government Expenditures**	**Wages and Salaries**	**Goods and services**	**Capital expenditure**	**Non-interest expenditure**	**Interest Payments**
Within dimension	Panel v	1.052	1.929	1.249	1.929	1.249	1.249
	Panel ρ	-0.690	-2.313*	-0.750	-2.313*	-0.750	-0.750
	Panel PP	-0.901	-4.918*	-0.923	-4.918*	-0.923	-0.923
	Panel ADF	-0.211	1.039	0.084	1.039	0.084	0.084
Between dimension	Panel ρ	-0.079	-1.559	0.185	-1.559	0.185	0.185
	Panel PP	-1.717	-7.368*	-1.384	-7.368*	-1.384	-1.384
	Panel ADF	-0.611	0.480	0.519	0.480	0.519	0.519

Notes: Cointegration tests between real GDP and different government expenditure variables. The null is that there is no cointegration. Under the null all the statistics are distributed as standard Normal distributions. An asterisk (*) indicates rejection at the 10 percent level or better. The columns labelled within-dimension contain the computed value of the statistics based on estimators that pool the autoregressive coefficient across different countries for the unit root tests on the estimated residuals. The columns labelled between-dimension report the computed value of the statistics based on estimators that average individually calculated coefficients for each country.