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Revisiting the Evidence on the Cyclicalities of Fiscal Policy across the World



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Abstract

We review the patterns of cyclicity in fiscal policy in a sample of 180 countries over a period of more than three decades. First, we consider issues of robustness in the choice of the proxy for fiscal cyclicity by using alternative filtering methods. Second, we rely on a country-specific approach to split our sample in sub-periods based on a test for structural break in the series of real GDP per capita. Third, we investigate the extent to which countries behave pro-cyclically or counter-cyclically in different phases of the business cycle. In line with earlier findings in the literature, we confirm that there is a causal link running from stronger institutions to less pro-cyclical fiscal policy, even after controlling for the endogeneity of institutions and other determinants of fiscal policy. In that context, we conclude by discussing a few policy directions that could guide countries aiming to strengthen their fiscal positions and be better equipped to adopt counter-cyclical fiscal policies.

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Revisiting the Evidence on the Cyclicalities of Fiscal Policy across the World*

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1. Introduction

A large and growing literature has argued that industrialized and developing countries behave very differently in relation to their fiscal policy stances over the business cycle. In that context, a significant number of authors have documented a more pro-cyclical behavior of fiscal policy in developing countries as opposed to industrial countries.² That is, developing countries tend to orient government consumption and investment in the same direction as that of the cycle in general economic activity. In doing so, they tend to amplify upswings and worsen recessions – what Kaminsky, Reinhart, and Vegh (2004) termed as the “when it rains, it pours” phenomenon. Industrialized countries, on the other hand, tend to behave largely in a counter-cyclical or at worst acyclical fashion. The most recent evidence of this pattern has been put forward by Frankel, Vegh, and Vuletin (2013) who not only have found additional support to the when-it-rains-it-pours idea but also regarding developing countries movement away from pro-cyclicalities.

Evidence on the pro-cyclical pattern of fiscal policy in developing countries was first found by Gavin and Perotti (1997) who showed that Latin America tended to adopt policies that were expansionary in good times and contractionary in bad times. Talvi and Vegh (2000) later showed that such behavior was far from being a trademark of Latin America alone as many other developing countries across the world espoused a pro-cyclical fiscal policy stance. There is a number of different explanations as to why developing countries tend to behave in that fashion vis à vis industrialized economies.³ Some of the reasons most commonly found in the literature include credit constraints faced by developing countries which would prevent them from raising money in international capital markets in bad times and would force them to adopt a contractionary fiscal policy in downturns (Gavin and Perotti (1997)). Political economy considerations would also seem to play a role as good times could encourage fiscal profligacy (Tornell and Lane (1998), Alesina and Tabellini (2005)).

From a theoretical point of view, the pro-cyclicalities of fiscal policy remains a puzzle from either a Keynesian or neoclassical perspective as it does not seem to be optimal to exacerbate the business cycle by adopting an expansionary fiscal policy in booms and a contractionary fiscal stance in a downturn. In neoclassical models, the optimal fiscal policy stance is either acyclical (Barro (1979)) or counter-cyclical (Baxter and King (1993)). In Keynesian models, on the other hand, with the presence of sticky prices or wages, the optimal fiscal policy stance is counter-cyclical (Christiano et al. (2011) and Nakata (2011)). A number of papers have argued that a pro-cyclical fiscal policy

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² See, for example, Gavin and Perotti (1997), Tornell and Lane (1998), Alesina and Tabellini (2005), Ilizetzi and Vegh (2008), and Park (2012).

³ The terms industrialized, high income, or developed economy are used interchangeably throughout the paper.

stance is the result of weak and underdeveloped institutions (e.g., Calderon and Schmidt-Hebel (2008), and Frankel et al. (2013)).

From a risk management point of view, a countercyclical fiscal policy can be useful for at least three compelling reasons (see World Bank (2014)). First, by leaning against the wind, governments can continue to provide goods and services and to maintain public investment even in the event of a drop in public revenues. Second, in a downturn, a countercyclical fiscal policy can help governments increase social assistance and insurance to a large number of citizens affected by more adverse macroeconomic conditions. Third, as witnessed during the global financial crisis of 2008-09, a countercyclical fiscal policy can help countries stimulate the economy and cope better with the effects of a prolonged recession. In that regard, as argued by Mollick et al. (2011), in the aftermath of the global financial crisis it became clear that the countries that weathered the effects of the crisis better were those that had followed some sort of concerted macro-fiscal responses that helped them build resilience to exogenous shocks. When the crisis hit, these countries were able to have more favorable access to credit in international financial markets and resist speculative attacks. Not only had they stronger fundamentals entering the crisis, which allowed them to quickly deploy counter-cyclical fiscal policies, but they were also better positioned to adopt exit strategies faster by raising interest rates, controlling domestic credit growth and reverting to more orthodox fiscal policies.

In this paper, we provide new evidence on the cyclicity of fiscal policy across industrialized and developing countries. Our sample includes 180 countries, of which 134 are developing countries and 46 are high income countries over the period 1980-2012. We follow the methodology of Frankel et al. (2013) but at the same time introduce three innovations to the empirical approach. First, we subject the proxy for fiscal cyclicity to alternative filtering methods to account for potential differences in a country's reported within-period average, and across-period changes in fiscal stance. Second, given the sensitivity of cyclicity outcomes to the choice of period, we rely on a country-specific approach to split our sample in sub-periods. Acknowledging the difficulties of carrying on such exercise when working with a large sample of countries, we suggest a first approximation for breaking the sample across countries based on a test for structural break in the series of real GDP per capita – we believe that this could be a better indicator of shifts in a country's overall economic policy, including its fiscal policy stance. Third, we investigate the extent to which countries behave pro- or counter-cyclically in different phases of the business cycle with the objective of assessing the empirical relevance of the when-it-rains-it-pours phenomenon when considering a larger sample of countries in comparison to earlier studies in the literature.

The paper is organized as follows. After this Introduction, Section 2 discusses issues associated with the choice of filter to smooth the proxy variable for fiscal cyclicity while Section 3 estimates our own “graduating class” under different filtering methods and a country-specific approach to split the sample into two sub-periods. Section 4 presents an analysis of how the countries in our sample behave over the business cycle. Section 5 discusses our findings on the empirical determinants of fiscal cyclicity while Section 6 explores endogeneity issues. Section 7 presents concluding remarks confirming earlier findings in the literature on the causal link between institutional quality and a less pro-cyclical fiscal stance and suggesting policy directions that could be useful to countries interested in strengthening their fiscal positions and becoming better equipped to adopt counter-cyclical fiscal policies.

2. Fiscal cyclicity under alternative filtering methods

In a recent paper, Frankel et al. (2013) documented a movement away from pro-cyclicality for a sizeable number of developing countries in the 2000s. The authors used a sample of 94 countries (21 developed and 73 developing) over a period of 49 years (1960-2009). Using a proxy for fiscal cyclicity based on correlation coefficients for time series of real government expenditures and real GDP smoothed by the Hodrick-Prescott filter, the authors were able to classify the countries according to their “ability to graduate” from fiscal pro-cyclicality. A negative (positive) correlation coefficient between the cyclical component of government spending and GDP indicates a counter-cyclical (pro-cyclical) fiscal policy stance. From comparing two subsequent periods (1960-1999 versus 2000-2009) using Boolean logic, the authors grouped countries based on their correlation coefficients and classified them in four different categories or “graduating classes”:

- i) *Established Graduates* (EG) as those with counter-cyclical fiscal policies in the first and second periods;
- ii) *Recent Graduates* (RG) as those with pro-cyclical policies in the first period and counter-cyclical in the second;
- iii) *Back to School* (BS) as those with counter-cyclical fiscal policies in the first period and pro-cyclical in the second; and
- iv) *Still in School* (SS) as those with pro-cyclical fiscal policies in the first and second periods.

We are interested in understanding how the results on the number of countries classified as pro-cyclical or counter-cyclical may differ if one chooses a different smoothing filter or changes the window period, even by one year. The latter is based on the knowledge that the Hodrick-Prescott filter yields results that are notoriously affected by end-point values (cyclical component and trend of a time series). In investigating these effects, we first compute fiscal cyclicity indicators under alternative approaches to the Hodrick-Prescott (HP) filter: Baxter-King (BK), Christiano-Fitzgerald (CF), Butterworth (BW) and the Harvey unobserved (HU) component model. We also move the window period by one year forward and backward for all filtering techniques. For this step we use data for real government expenditures and real GDP covering 180 countries for the period 1980-2013. We also apply a criterion for splitting the sample, by country, at potentially different points in time based on potential structural breaks in (per capita GDP) data. The intuition behind this is that changes in macroeconomic policies and performance generally reflect on changes in per capita income. A structural break on the series for the latter may be indicative of changes in a country’s fiscal stance.

We use data from the IMF’s World Economic Outlook (WEO) for real GDP and for real government expenditures over the period 1980-2013. With our larger sample, we compute fiscal cyclicity indicators (correlation coefficients of cyclical components of real government expenditures and real GDP) and classify countries according to their graduating class under alternative filtering methods. We divide our sample into two sub-periods (1990-2000 and 2000-

2013)⁴ with the objective of observing changes in the cyclical behavior of fiscal policy over our total sample period (1980-2013). Out of the 180 countries in our sample, we were able to compute fiscal policy stance proxies for both sub-periods for only 147 economies (104 developing and 43 developed). Results by selected groups of countries (full sample, high income, developing) are summarized in Table 1.

In line with the findings of Frankel et al. (2013), our results show that irrespective of the filtering method, developing countries represent the larger share of recent graduates – ranging from two thirds to three quarters of the total of graduates (i.e., those moving from a pro-cyclical fiscal stance in the period 1990-2000 to counter-cyclical in the period 2000-2010). Since the number of countries moving to counter-cyclical fiscal policies (for all filtering methods) exceeds the number of countries classified as back to school (i.e., those moving from counter-cyclical to pro-cyclical, also for all filtering methods) the overall share of countries with counter-cyclical policies now rises to something between 50 and 55 percent for the sample of countries with data in both sub-periods (1990-2000 and 2000-2010).

A drawback with the classification of countries by graduating class is that this approach does not allow one to gauge the relative progress of countries towards a more counter-cyclical (pro-cyclical) fiscal stance. By looking at changes in the value of the correlation coefficient of real government expenditures and real GDP in 2000-2010 versus 1990-2000 (instead of graduating classes) we see that 59 out of 104 developing countries (56.7 percent) with data for both sub-periods improved their fiscal stance. In addition, 30 out of 43 developed countries (69.7 percent) also improved their fiscal stance. This shows a greater relative progress towards counter-cyclicality among developed economies compared to developing countries. Nevertheless, our results show that both developing and developed economies have moved away from pro-cyclicality.

3. Splitting the sample based on country-specific information

Our next objective is to take into account country-specific information in the choice of the sub-periods that we use to calculate the correlation coefficients. We believe that there is a gain in accuracy by choosing a country-specific criterion for splitting the series of government expenditures and GDP in different sub-periods for comparison purposes. Our proposed criterion is to use tests for structural breaks in the series of real GDP per capita. Our premise is that structural breaks in that series may be associated with significant changes in economic policy, an external or internal socio-economic shock, or some other event that could involve a shift in a country's fiscal stance. To test for the structural breaks in the real GDP per capita series we apply the Quandt likelihood ratio (QLR) test⁵.

As in Frankel et al. (2013), we were able to document that a sizable number of developing countries are graduating from fiscal policy pro-cyclicality. This is based on the number of developing countries shifting from a pro-cyclical to a counter-cyclical fiscal stance between country-specific

⁴ We use a sub-period, 1990-2010, from the overall 1980-2013 dataset because for many countries, data on real government expenditures and / or on GDP are missing, mostly for the early 1980s. Also, some filtering techniques discard endpoint values based on user-defined parameter specification.

⁵ Likelihood ratio tests are applied to the specification: $lypc_t = \alpha_0 + \alpha_1 \times lypc_{t-1}$ at every point in time for the period 1990-2013 for a particular country (lypc_t is a country's per capita real GDP in year t, in logs). Structural breaks correspond to the years that yield the maximum value for the QLR test. Comparisons to critical values are made based on Andrew (1993) and Andrews & Ploberger (1994).

defined periods (between 22-25 percent of developing countries, depending on the filtering method), relative to the number of countries falling back into pro-cyclical fiscal policies (17-19 percent of developing countries classified as back to school). However, our evidence on developing countries graduating from pro-cyclicality is weaker now than when the sample is divided uniformly (same year) for all countries. This is visible by comparing results in Table 5 with those reported in Table 1. In fact, based on the criterion that splits the series on a country-specific basis, the ratio of developed countries graduating from pro-cyclicality (in the range of 26-34 percent of high income countries with data, depending on the filtering method) is higher than that of developing economies. Figure 1 supports that observation.

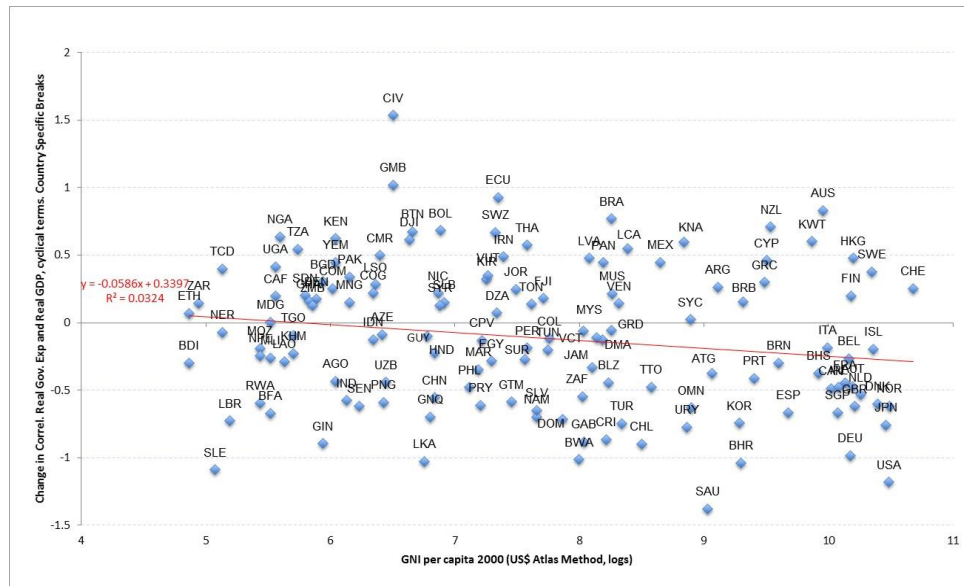
Table 1: Number of Countries per Graduating Class for Selected Filtering Methods: 1990-2010

	Baxter- King	Hodrick- Prescott	Christiano- Fitzgerald	Butterworth
Full sample	147 (140)	147 (140)	147 (140)	147 (140)
Established Graduates	37 (30)	34 (28)	32 (26)	32 (33)
Recent Graduates	37 (37)	43 (35)	45 (34)	49 (39)
Back to School	24 (23)	21 (22)	22 (22)	24 (24)
Still in School	49 (50)	49 (55)	48 (58)	42 (44)
<i>(No data in both periods)</i>	<i>32 (39)</i>	<i>32 (39)</i>	<i>32 (39)</i>	<i>32 (39)</i>
 High Income (with data)	 43 (38)	 43 (38)	 43 (38)	 43 (38)
Established Graduates	19 (13)	16 (14)	16 (14)	12 (15)
Recent Graduates	13 (13)	12 (10)	11 (11)	18 (13)
Back to School	6 (3)	5 (3)	7 (4)	5 (4)
Still in School	5 (9)	10 (11)	9 (9)	8 (6)
<i>(No data in both periods)</i>	<i>3 (8)</i>	<i>3 (8)</i>	<i>3 (8)</i>	<i>3 (8)</i>
 Developing (with data)	 104 (102)	 104 (102)	 104 (102)	 104 (102)
Established Graduates	18 (17)	18 (14)	16 (12)	20 (18)
Recent Graduates	24 (24)	31 (25)	34 (23)	31 (26)
Back to School	18 (20)	16 (19)	15 (18)	19 (20)
Still in School	44 (41)	39 (44)	39 (49)	34 (38)
<i>(No data)</i>	<i>29 (31)</i>	<i>29 (31)</i>	<i>29 (31)</i>	<i>29 (31)</i>

Source: Authors' calculations based on IMF, WEO

Note: The first number represents the number of countries in each graduating class obtained by a comparison of the correlation coefficients in two periods (1990-2000 and 2000-2010); second number (in brackets) is the number of countries in each graduating class obtained by breaking the sample according to country-specific breaks.

Figure 1: Midpoint GNI per capita (2000) vs Average Change in Fiscal Cyclicity. Country Specific Breaks.



Source: Authors' calculations based on data from World Economic Outlook (IMF) and World Development Indicators (World Bank).

Note: The chart plots changes in the fiscal cyclicity proxy across countries based on country-specific breaks. We subtract the value for the final period from the value for the initial period, so a positive change is indicative of a movement towards pro-cyclicality.

4. Does it really pour when it rains?

An idea put forward by Kaminsky, Reinhart, & Végh (2004) was that for developing countries, and in particular for upper middle-income countries, macroeconomic policies and in special fiscal policy tend to reinforce the business cycle (the when-it-rains-it-pours syndrome). They found evidence in support of that by looking at a sample of 104 countries over the period 1960-2003 and were able to show that in contrast to that behavior OECD countries seemed to orient their macroeconomic policies at stabilizing the business cycle. We now turn our attention to the same empirical question with the objective of assessing if the when-it-rain-it-pours phenomenon remains relevant over the most recent period.

We make two implicit assumptions as to why countries change their fiscal stance. First, we consider that changes are generally not random. That they are mostly associated with policy shifts within given administrations, which may or may not be politically motivated (as incumbent administrations tend to spend more ahead of elections), or across administrations after elections, influenced by ideological principles. Second, we assume that they are generally driven or motivated by observed trends in economic activity and not the other way around.⁶ This assumption is not uncontroversial. For instance, Rigobon (2004) argues that fiscal policy shocks drive output and not

⁶ See, for instance, Kaminsky, Reinhart, & Végh (2004).

the other way around, while Ilzetzi & Vegh (2008), on the other hand, find causality running both ways.

Keeping these assumptions in mind we proceed to re-compute correlation coefficients for the fiscal cyclicality proxy for the period 1990-2011 by differentiating what happens in fiscal policy in different parts of the business cycle. It may be the case that a country's average fiscal stance within a period differs during years of expansion compared to that adopted in years of downturn in economic activity. Countries that are, on average, pro-cyclical in booms and downturns, would tend to exacerbate their business cycle; those that are counter-cyclical in both, booms and downturns, have a fiscal policy that contributes to stabilize the cycle⁷.

But countries may not be always pro-cyclical or counter-cyclical. Whenever a country exhibits an average counter-cyclical fiscal stance in booms, and a pro-cyclical stance in downturns, other things equal, it will likely improve its medium to long term fiscal sustainability profile.⁸ A country that is pro-cyclical in booms and counter-cyclical in downturns would, *ceteris paribus*, deteriorate its fiscal sustainability profile. Figure 2 plots the value of the fiscal stance proxy in periods of expansion (when the cyclical component of real GDP are positive) versus that registered in downturns. High-income countries are those in red while developing economies are in blue⁹. By quadrants, we identify four groups of countries:

- Upper right quadrant: Those that exhibit pro-cyclical fiscal policies in both booms and downturns. Other things equal, such stance contributes to exacerbate output volatility. Not surprisingly, one finds many resource-rich economies in this category. In addition, many upper middle-income countries appear prominently in that group.
- Upper left quadrant: Those that exhibit counter-cyclical fiscal policies in booms and pro-cyclical fiscal policies in downturns. Other things equal, such fiscal behavior improves a country's fiscal sustainability profile.
- Lower left quadrant: Those that exhibit counter-cyclical fiscal policies in both booms and downturns. Other things equal, such stance contributes to stabilize output around its long-term trend. Expectedly, most of high-income countries fall under this category.
- Lower right quadrant: Those that exhibit pro-cyclical fiscal policies in booms and counter-cyclical fiscal policies in downturns. Other things equal, such behavior deteriorates a country's fiscal sustainability profile.

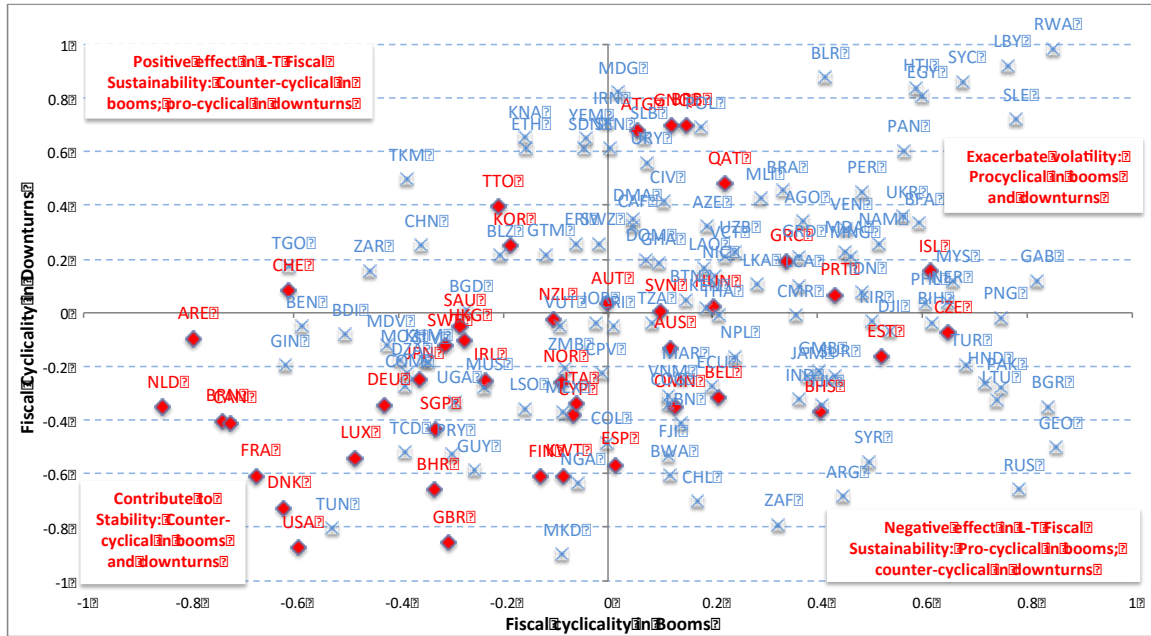
A simple visual inspection of Figure 2 seems to lend support to the when-it-rains-it-pours phenomenon. Most of the countries in the upper and lower right quadrants of the chart are developing economies (in blue), many resource-rich countries and most importantly upper middle-income countries. In contrast to that, most of the high income countries appear on the upper and lower left quadrants with fiscal stances that largely contribute to long-term fiscal sustainability.

⁷ Of course, there are other sources of volatility, so a country with counter-cyclical fiscal policies may experience a higher output volatility than that of fiscally pro-cyclical economies.

⁸ As explained in Villafuerte, Lopez-Murphy, & Ossowski (2010), analyses of fiscal sustainability often focus on a comparison between the observed cyclically-adjusted primary balance against a debt-stabilizing primary balance. This approach is combined with a "reasonable" objective for the debt to GDP ratio (debt tolerance). Of course, the idea that a country improves its fiscal balance by being counter-cyclical in booms and pro-cyclical in downturns implicitly assumes a more than proportional change in government revenues to changes in GDP (Buoyancy).

⁹ World Bank classification. The sample includes 156 countries after dropping countries with less than 5 observations available when the cyclical component of real GDP is >0 or less than 5 observations available when the cyclical component of real GDP is <0.

Figure 2: Fiscal Cyclicity in Booms and Downturns (1990-2011), based on Baxter-King Filter



Source: Authors' calculations based on IMF, WEO, October 2014.

5. Quality of institutions and fiscal policy cyclicity

However informative our results are, they are not sufficient to identify the main determinants of a country's change in fiscal cyclical stance over time. A number of authors have tried to address this in the literature for different country samples, using different cyclicity proxies and different time periods, with –expectedly- mixed results (Alesina & Tabellini (2005), Park (2012), Mpatswe, Tapsoba, & York (2011), Villafuerte, Lopez-Murphy, & Ossowski (2010)). More recently, Frankel, Vegh, and Vuletin (2013) have considered the role played by institutional quality on a country's ability to graduate from pro-cyclicity. We follow the same approach but are also interested in checking whether the finding that institutions matter as a determinant of fiscal policy cyclicity holds for our expanded and more up to date sample of countries, as well as for the cases in which the series are split based on our country-specific (per capita GDP) criterion. We also consider an alternative proxy for institutional quality based on Kunčič (2013) in addition to the institutional quality variable constructed from the International Country Risk Guide (ICRG) dataset used in Frankel et al. (2013).

We use a sample of 180 countries for the period 1990-2011, but due to the limited availability of data for the ICRG variable for which information is available for only 138 countries up to 2010, we include econometric results using an alternative proxy for IQ based on Kunčič (2013), which is available for 193 economies for the period 1990-2011.

We estimate the following econometric specifications:¹⁰

$$g_{i,t}^c = \alpha_1 + \alpha_2 \times y_{i,t}^c + \alpha_3 \times (y_{i,t}^c \times IQ_{i,t}) + IQ_{i,t} + \alpha_q \times Z_q + \eta_i + \varepsilon_{i,t} \quad (1)$$

First, in Eq. (1) we start with a country panel fixed effects specification (country “i” and year “t”) linking the cyclical component of real government expenditures ($g_{i,t}^c$) to the cyclical component of real GDP ($y_{i,t}^c$) and a proxy for institutional quality ($IQ_{i,t}$) and a vector Z of “q” additional controls to address possible omitted variable bias problems. The interaction variable is meant to show how institutional quality increases (a positive sign for α_3 , in the event of $\alpha_2 > 0$) or decreases ($\alpha_3 < 0$, in the event of $\alpha_2 > 0$) fiscal pro-cyclicality. The results appear in Table 2 for the period 1984-2009 and include a set of control variables.

$$g_{i,t}^c = \alpha_1 + \alpha_2 \times y_{i,t}^c + \alpha_3 \times (y_{i,t}^c \times IQ_{i,t}^{initial}) + \alpha_4 \times (y_{i,t}^c \times \Delta IQ_{i,t}) + \alpha_5 \times IQ_{i,t}^{initial} + \alpha_6 \Delta IQ_{i,t} + \alpha_q \times Z_q + \eta_i + \varepsilon_{i,t} \quad (2)$$

Second, in Eq. (2) we consider the case in which the role of initial institutional quality ($IQ_{i,t}^{initial}$) and changes of the variable ($\Delta IQ_{i,t}$) are assessed separately. One expects both signs of the parameters of the interaction terms included in the Eq. (2), α_3 and α_4 , to be negative and significant in explaining the relationships between cyclical components of real government expenditures and real GDP (in the event of $\alpha_2 > 0$). Results for this specification are reported in Table 3, which also include a set of control variables.

$$\rho_i^{avg} = \alpha_1 + \alpha_2 \times IQ_i^{avg} + \alpha_q \times Z_q + \eta_i + \varepsilon_i \quad (3)$$

Equation 3 is a cross section specification where the dependent variable (ρ_i^{avg}) is the correlation coefficient of real government expenditures and real GDP for a given time period. The specification is first computed including the average value of the institutional quality variable (IQ_i^{avg}) for the same period as sole control, and then adding additional explanatory variables (vector Z). Again, the value for α_2 is expected to be negative and statistically significant. The results of this specification are reported in Table 4.

In all cases, the exercises are conducted for the alternative definitions of fiscal cyclicality, namely, using the Hodrick-Prescott, Baxter-King, Christiano-Fitzgerald and Butterworth filters. Our results confirm the sign and significance of the institutional quality variable, considering alternative definitions of fiscal cyclicality, either on average for the full period 1984-2009, or for both, initial or changes in institutional quality. Our analysis also confirms the significance of institutional

¹⁰ As much as possible we try to keep the same notation as in Frankel, Vegh, & Vuletin (2013) to ease the comparability of methodologies and results.

quality in explaining the value of the fiscal cyclicality proxy for the period 1984-2009 under the cross-country specification in Equation 3 (results in Table 4).

6. Endogeneity test

Endogeneity concerns are common in the context of causality analysis involving institutional quality and other macroeconomic variables. The work by Acemoglu, Johnson, & Robinson (2001) provided an excellent framework for the analysis of institutional quality on current economic performance by tracing historical relationships of European settler mortality to the type of settlements and quality of early institutions in former colonies, to current quality of institution and level of income. From their methodological point of view, the authors were able to identify a source of exogenous variation in institutions that affected a country's current per capita income.

We follow the same approach for addressing endogeneity concerns on the relationship between institutional quality and fiscal stance. In order to look for potential endogeneity problems, we use Equation 3, a cross-country specification for the impact of average institutional quality and other controls, over the fiscal stance proxy, using an instrumental variable specification. Alternative definitions of institutional quality (ICRG and Kunčič (2013)) and alternative fiscal stance proxies are used. Instruments for institutional quality are European settlers' mortality rates (in logs) and latitude, following Acemoglu, Johnson, & Robinson (2001) and Frankel, Vegh, & Vuletin (2013). Table 5 compares results of Ordinary Least Squares (OLS) versus Instrumental Variable specifications under the alternative IQ and fiscal stance proxies. Table 6 adds a set of controls, following Equation 3, including financial depth, financial integration, debt to GDP ratios, government accountability, output volatility and the reserves to import ratio. In all cases we find evidence of causality running from IQ to fiscal stance.

7. Concluding remarks and policy implications

We have confirmed earlier findings in the literature showing that a number of developing countries have graduated from fiscal policy pro-cyclicality (c.f., Frankel et al. (2013)). In comparison with industrialized countries, however, developing countries tend to behave in a way that contributes to exacerbate the effects of the business cycle; that is, they tend to exhibit more often than industrialized economies pro-cyclical fiscal policies in both booms and downturns, contributing to exacerbate output volatility. This result coincides with the findings from Kaminsky et al. (2004) and represent additional evidence in support of the "when-it-rains-it-pours" phenomenon. This finding is robust to the choice of different filters to smooth the proxy of fiscal policy cyclicality over time and to a country-specific criterion based on a test for structural break that we have used to split our sample in sub-groups for comparison purposes.

We have also found evidence in support of the idea that institutional quality is an important determinant of a country's fiscal stance. This is an important result that suggests that efforts to graduate from fiscal policy pro-cyclicality need to be accompanied by policy reforms that seek to strengthen the ability of countries to save in good times to generate fiscal buffers that could be used in bad times. In that regard, initiatives such as the establishment of fiscal councils and the adoption of fiscal rules, the development of sound debt management strategies that reinforce fiscal discipline, and the strengthening of macro prudential regulations appear to be necessary conditions for graduation from pro-cyclicality.

The adoption of fiscal responsibility laws and fiscal rules, for example, are widely recognized as effective mechanisms that can increase the discipline and credibility of the fiscal authorities. The introduction of fiscal rules, however, are usually supported by expenditure reforms in the context of a medium term fiscal framework to signal the authorities' commitment to fiscal sustainability. Many countries that have adopted fiscal rules, or some kind of rules-based fiscal framework, have also benefitted from the parallel creation of an independent fiscal council that monitors macroeconomic projections underlying the budgeting process and the compliance with the fiscal rule.

Finally, countries can also draw on existing good practices on how to strengthen their fiscal positions and be better equipped to adopt counter-cyclical fiscal policies. Moving towards a full blown fiscal responsibility law, with or without a formal fiscal rule, requires some preparation and building technical capacity in order to design, implement, and monitor the new policy tool. There are some well-established good practices in that regard such as an establishment of savings funds with a strong institutional framework, a solid governance structure and clear operational rules for the allocation of the fund's resources. The proceeds accumulated in such a fund could be used for emergency situations following a protracted economic shock, for example. Other policy options that could help countries respond in a more symmetric way to the business cycle include, for example, expenditure ceilings, cyclical deficit targets, and rules-based stabilization funds.

An interesting topic for further research is associated with the role of external factors or exogenous institutions as additional determinants of a country's propensity to graduate or not from procyclical fiscal policies. For example, resource-rich economies might be more tempted to behave in a procyclical way due to rent-seeking and delay the development of domestic institutions that could help them become more counter-cyclical. Likewise, small developing countries that have close commercial ties with larger industrialized economies might behave in the same way as resource-rich economies and delay moving towards fiscal counter-cyclicality. It would be particularly interesting to look at the pattern of fiscal policy cyclicalities in this group of countries during the recent commodity super cycle period.

Table 2

Panel Regression: Determinants of Cyclical Component of Real Gov. Expenditures (Alternative Filters), Additional Controls, Period 1984-2009				
VARIABLES	(1)	(2)	(3)	(4)
	Cyclical Component of Real Gov. Exp., HP filter	Cyclical Component of Real Gov. Exp., BK filter	Cyclical Component of Real Gov. Exp., CF filter	Cyclical Component of Real Gov. Exp., BU filter
Cyclical Component of Real GDP, Alternative Filters ^(x)	2.899*** (8.337)	3.061*** (7.631)	1.940*** (7.280)	3.218*** (7.273)
Interaction Cyclical Component of Real GDP Filter and Institutional Quality ^(x)	-3.021*** (-5.042)	-3.042*** (-4.406)	-1.319*** (-3.218)	-3.222*** (-4.064)
Interaction Cyclical Component of Real GDP and Chinn-Ito Index of Capital Openness ^(x)	0.086 (1.440)	0.099 (1.407)	0.043 (1.106)	0.100 (1.207)
Interaction Cyclical Component of Real GDP and Financial Depth (M2/GDP) ^(x)	-0.003 (-1.230)	-0.005 (-1.505)	-0.003* (-1.888)	-0.004 (-1.040)
Interaction Cyclical Component of Real GDP and Volatility (Squared Cyclical Component of GDP) ^(x)	-5.571 (-0.319)	-5.200 (-0.208)	17.303 (0.848)	-8.466 (-0.294)
Interaction Cyclical Component of Real GDP and Proxy Political Checks and Balances ^(x)	0.072 (1.437)	0.107* (1.791)	0.047 (1.380)	0.146** (2.086)
Interaction Cyclical Component of Real GDP and Debt Ratio to GDP ^(x)	-0.005*** (-3.855)	-0.007*** (-4.443)	-0.005*** (-5.247)	-0.009*** (-5.527)
Interaction Cyclical Component of Real GDP and Reserves Ratio to Imports ^(x)	-0.079*** (-5.777)	-0.065*** (-3.833)	-0.026** (-2.355)	-0.060*** (-3.035)
Institutional Quality Proxy	0.000 (0.001)	0.001 (0.049)	0.052* (1.953)	0.014 (0.823)
Chinn-Ito Index of Capital Openness	0.001 (0.590)	0.001 (0.466)	0.001 (0.479)	0.001 (0.785)
Financial Depth (M2 Ratio to GDP)	0.000 (1.513)	0.000* (1.750)	0.000* (1.904)	0.000 (1.444)
GDP Volatility (Squared Cyclical Component of GDP)	-0.489 (-0.354)	0.278 (0.193)	0.443 (0.322)	0.201 (0.183)
Proxy for Political Checks and Balances	-0.001 (-0.332)	-0.001 (-0.513)	-0.003 (-1.382)	-0.000 (-0.262)
Debt to GDP Ratio	0.000 (1.136)	0.000 (1.246)	0.000*** (5.493)	0.000*** (4.178)
Reserves to Imports Ratio	-0.000 (-0.604)	-0.000 (-0.849)	0.001 (1.046)	0.000 (0.008)
Constant	-0.010 (-0.707)	-0.013 (-0.911)	-0.060*** (-3.534)	-0.023** (-2.168)
Observations	1,952	1,768	1,768	1,768
R-squared	0.085	0.087	0.082	0.077
Number of code1	91	90	90	90
r2_a	0.0328	0.0302	0.0243	0.0195
F	11.41	10.60	9.863	9.272

t-statistics in parentheses

***p<0.01, **p<0.05, *p<0.1

(x) The filter used to compute the cyclical component of GDP is the same as that used for computing the dependent variable

source: Authors' calculations

Table 3

Panel Regression: Determinants of Cyclical Component of Real Gov. Expenditures (Alternative Filters and Two Alternative Proxies for Institutional Quality), Additional Controls, Period 1990-2013.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Institutional Quality Proxies that of Kuncic (2013)				Institutional Quality Proxies ICRG			
	Cyclical Component of Real Gov. Exp., IHP filter	Cyclical Component of Real Gov. Exp., BK filter	Cyclical Component of Real Gov. Exp., ICF filter	Cyclical Component of Real Gov. Exp., BU filter	Cyclical Component of Real Gov. Exp., IHP filter	Cyclical Component of Real Gov. Exp., BK filter	Cyclical Component of Real Gov. Exp., ICF filter	Cyclical Component of Real Gov. Exp., BU filter
Cyclical Component of Real GDP, Alternative filters ^(x)	1.025*** (3.853)	0.756** (2.482)	1.151*** (7.510)	-0.082 (-0.245)	1.990*** (7.837)	2.552*** (8.006)	1.211*** (9.185)	2.536*** (7.044)
Interaction Cyclical Component of Real GDP filter and Institutional Quality, Alternative filters ^(x)	-0.564 (-0.867)	0.164 (0.225)	-1.170*** (-4.279)	1.366 (1.589)	-1.788*** (-3.631)	-2.843*** (-4.538)	-1.074*** (-5.466)	-3.044*** (-4.282)
Interaction Cyclical Component of Real GDP and Chinn-Ito Index of Capital Openness, Alternative filters ^(x)	-0.042 (-0.794)	-0.071 (-1.199)	-0.002 (-0.090)	-0.056 (-0.822)	-0.028 (-0.609)	-0.015 (-0.286)	0.002 (0.124)	-0.005 (-0.077)
Interaction Cyclical Component of Real GDP and Financial Depth (M2/GDP), Alternative filters ^(x)	-0.007*** (-2.884)	-0.008*** (-3.063)	-0.001 (-1.405)	-0.009*** (-2.871)	-0.009*** (-5.201)	-0.004* (-1.669)	-0.001** (-1.974)	-0.003 (-1.058)
Interaction Cyclical Component of Real GDP and Volatility (Squared Cyclical Component of GDP), Alternative filters ^(x)	-3.047 (-1.562)	-3.568 (-0.807)	-4.516 (-1.329)	-1.541 (-0.327)	5.034* (1.818)	7.698* (1.712)	1.243 (0.616)	14.587*** (2.820)
Interaction Cyclical Component of Real GDP and Proxy for Political Checks and Balances, Alternative filters ^(x)	0.007 (0.145)	-0.017 (-0.314)	0.030** (2.547)	-0.012 (-0.197)	0.013 (0.310)	-0.010 (-0.221)	0.013 (1.076)	0.013 (0.234)
Interaction Cyclical Component of Real GDP and Debt Ratio to GDP, Alternative filters ^(x)	0.002** (2.380)	0.002** (2.534)	-0.000 (-0.129)	0.004*** (3.437)	-0.001 (-0.891)	-0.002* (-1.866)	-0.000 (-0.209)	-0.002** (-2.004)
Interaction Cyclical Component of Real GDP and Reserves Ratio to Imports, Alternative filters ^(x)	0.004 (0.646)	0.011* (1.672)	0.006* (1.775)	0.015** (2.488)	-0.002 (-0.514)	-0.014 (-1.394)	0.004 (1.129)	-0.029** (-2.512)
Institutional Quality Proxy	0.010 (0.244)	0.017 (0.419)	0.187*** (3.198)	0.011 (0.368)	0.013 (0.490)	0.046* (1.657)	0.229*** (5.010)	0.021 (0.986)
Chinn-Ito Index of Capital Openness	0.000 (0.064)	0.002 (0.757)	0.002 (0.431)	0.001 (0.312)	-0.001 (-0.247)	0.000 (0.183)	0.001 (0.173)	-0.000 (-0.265)
Financial Depth (M2 Ratio to GDP)	0.000*** (2.856)	0.000*** (2.849)	0.000*** (2.594)	0.000* (1.806)	0.000** (2.383)	0.000** (2.354)	0.000*** (2.588)	0.000 (1.297)
GDP Volatility (Squared Cyclical Component of GDP), Alternative filters ^(x)	-0.804 (-1.485)	-0.716 (-0.793)	0.088 (0.077)	-0.046 (-0.067)	1.268* (1.705)	0.945 (1.275)	1.018* (1.816)	1.284** (2.145)
Proxy for Political Checks and Balances	-0.002 (-1.067)	-0.002 (-1.124)	-0.009*** (-2.952)	-0.001 (-1.130)	-0.001 (-0.366)	-0.001 (-0.593)	-0.005 (-1.581)	-0.001 (-0.573)
Debt Ratio to GDP	0.000* (1.931)	0.000 (1.291)	0.000 (1.153)	0.000* (1.850)	0.000*** (2.782)	0.000 (0.648)	0.000 (1.567)	0.000 (1.474)
Reserves to Imports Ratio	-0.000 (-0.528)	-0.000 (-0.687)	-0.001 (-1.340)	-0.000 (-0.177)	-0.001 (-1.464)	-0.000 (-1.020)	-0.001 (-1.239)	-0.000 (-0.612)
Constant	-0.019 (-0.925)	-0.024 (-1.085)	-0.070** (-2.157)	-0.014 (-0.843)	-0.021 (-1.271)	-0.038** (-2.157)	-0.108*** (-3.691)	-0.018 (-1.340)
Observations	2,538	2,462	2,466	2,466	2,377	2,209	2,213	2,213
R-squared	0.069	0.057	0.060	0.029	0.115	0.114	0.099	0.088
Number of code1	155	154	154	154	125	124	124	124
r2_a	0.00256	-0.0120	-0.00864	-0.0420	0.0604	0.0546	0.0390	0.0270
F	11.70	9.255	9.793	4.579	19.45	17.70	15.18	13.29

t-statistics in parentheses

***p<0.01, **p<0.05, *p<0.1

(x) If the filter used to compute the cyclical component of GDP is the same as that used for computing the dependent variable

source: Authors' calculations

Table 4

Cross-Country Regression: Fiscal Cyclical Proxy Under Alternative Filtering Methods, 1990-2011, Role of Instit. Quality and Determinants, Instit. Quality Proxy Is That of Kuncic (2013)								
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Correl. Cyclical Component	Correl. Cyclical Component	Correl. Cyclical Component	Correl. Cyclical Component	Correl. Cyclical Component	Correl. Cyclical Component	Correl. Cyclical Component	Correl. Cyclical Component
	Real Gov. Exp. And Real GDP, HP filter	Real Gov. Exp. And Real GDP, BK filter	Real Gov. Exp. And Real GDP, CF filter	Real Gov. Exp. And Real GDP, BU filter	Real Gov. Exp. And Real GDP, HP filter	Real Gov. Exp. And Real GDP, BK filter	Real Gov. Exp. And Real GDP, CF filter	Real Gov. Exp. And Real GDP, BU filter
Institutional Quality, average 1990-2010, Proxy from Kuncic (2013)	-0.951*** (-5.789)	-0.767*** (-4.609)	-0.848*** (-5.085)	-0.699*** (-4.119)	-0.949*** (-3.172)	-0.604** (-2.021)	-0.945*** (-3.057)	-0.658** (-2.142)
Chinn-Ito Index of Capital Openness, average 1990-2011					0.002 (0.074)	-0.029 (-1.120)	-0.001 (-0.028)	-0.010 (-0.377)
Financial Depth (M2 Ratio to GDP), average 1990-2011					-0.001 (-1.108)	-0.001 (-0.874)	-0.001 (-0.977)	-0.001 (-1.158)
GDP volatility (Squared Cyclical Component of GDP), average 1990-2011 ^(x)					34.724** (2.512)	37.840** (2.493)	-0.445 (-1.035)	56.727** (2.343)
Proxy for Political Checks and Balances, average 1990-2011					0.030 (1.176)	0.016 (0.613)	0.029 (1.105)	0.028 (1.069)
Debt to GDP ratio, average 1990-2011					-0.001 (-0.801)	-0.001 (-0.993)	-0.000 (-0.749)	-0.000 (-0.557)
Reserves to Imports Ratio, average 1990-2011					-0.013* (-1.842)	-0.017** (-2.313)	-0.003 (-0.453)	-0.017** (-2.135)
Constant	0.601*** (6.679)	0.500*** (5.475)	0.544*** (5.958)	0.424*** (4.568)	0.644*** (4.431)	0.533*** (3.675)	0.635*** (4.115)	0.483*** (3.233)
Observations	156	155	156	156	155	154	155	155
R-squared	0.179	0.122	0.144	0.099	0.246	0.203	0.182	0.171
r2_a	0.173	0.116	0.138	0.0934	0.210	0.165	0.143	0.132
F	33.52	21.25	25.85	16.97	6.838	5.320	4.680	4.338

t-statistics in parentheses

***p<0.01, **p<0.05, *p<0.1

(x) The filter used to compute the cyclical component of GDP is the same as that used for computing the dependent variable source: Authors' calculations

Table 5: OLS and Two-Stage Least Square for Instrumental Variable Estimation regarding the effect of Institutional Quality on fiscal cyclical stance (instruments are log settler mortality following Acemoglu, Johnson, & Robinson (2001))

Dependent Variable is the Correlation Coefficient of Real Government Expenditures and Real GDP, 1990-2011 (Alternative Filtering Methods)	OLS		OLS		OLS		OLS	
	IV	IV	IV	IV	IV	IV	IV	IV
VARIABLES	Hodrick-Prescott	Baxter-King	Christiano-Fitzgerald	Butterworth				
IQ:Kuncic, Avg. 1990-2010	-1.119*** (-7.096)	-1.284*** (-4.550)	-0.941*** (-5.771)	-1.170*** (-4.112)	-0.996*** (-6.056)	-1.017*** (-3.469)	-0.838*** (-4.951)	-1.039*** (-3.305)
Constant	0.718*** (7.633)	0.751*** (5.103)	0.618*** (6.351)	0.701*** (4.724)	0.651*** (6.636)	0.619*** (4.049)	0.530*** (5.249)	0.596*** (3.630)
Observations	123	71	123	71	123	71	123	71
R-squared	0.294	0.360	0.216	0.305	0.233	0.288	0.168	0.219
r2_a	0.288	0.351	0.209	0.295	0.226	0.277	0.162	0.207
F	50.36	20.71	33.31	16.91	36.67	12.04	24.51	10.93

t-statistics in parentheses

***p<0.01, **p<0.05, *p<0.1

Dependent Variable is the Correlation Coefficient of Real Government Expenditures and Real GDP, 1990-2011 (Alternative Filtering Methods)	OLS		OLS		OLS		OLS	
	IV	IV	IV	IV	IV	IV	IV	IV
VARIABLES	Hodrick-Prescott	Baxter-King	Christiano-Fitzgerald	Butterworth				
IQ:Kuncic, Avg. 1990-2010	-0.973*** (-5.805)	-1.429*** (-4.058)	-0.787*** (-4.595)	-1.292*** (-3.652)	-0.853*** (-4.998)	-1.233*** (-3.594)	-0.738*** (-4.231)	-1.143*** (-3.143)
Constant	0.611*** (6.642)	0.813*** (4.633)	0.509*** (5.405)	0.745*** (4.209)	0.547*** (5.844)	0.718*** (4.195)	0.455*** (4.749)	0.639*** (3.524)
Observations	145	84	144	83	145	84	145	84
R-squared	0.191	0.130	0.129	0.065	0.149	0.128	0.111	0.084
r2_a	0.185	0.119	0.123	0.0537	0.143	0.117	0.105	0.0724
F	33.70	16.47	21.12	13.34	24.98	12.92	17.90	9.881

t-statistics in parentheses

***p<0.01, **p<0.05, *p<0.1

Table 6: OLS and Two-Stage Least Square for Instrumental Variable Estimation regarding the effect of Institutional Quality on fiscal cyclicity stance (instruments are log settler mortality following Acemoglu, Johnson, & Robinson (2001)) and additional controls

VARIABLES	Dependent Variable is the Correlation Coefficient of Real Government Expenditures and Real GDP, 1990-2011 (Alternative Filtering Methods)							
	OLS		OLS		OLS		OLS	
	Hodrick-Prescott		Baxter-King		Christiano-Fitzgerald		Butterworth	
IQ: ICRG Avg. 1990-2010	-1.028*** (-3.903)	-1.650* (-1.926)	-0.732** (-2.586)	-1.178 (-1.394)	-1.130*** (-3.929)	-1.448 (-1.602)	-0.697** (-2.411)	-1.516 (-1.513)
Chinn-Ito Index of Capital Openness, Average 1990-2011	-0.009 (-0.348)	0.021 (0.553)	-0.041 (-1.507)	0.009 (0.230)	-0.001 (-0.036)	0.005 (0.106)	-0.022 (-0.785)	0.034 (0.768)
Financial Depth (M2 Ratio to GDP), Average 1990-2011	-0.000 (-0.295)	0.001 (0.462)	0.000 (0.046)	-0.000 (-0.086)	0.001 (0.477)	0.002 (0.576)	-0.000 (-0.297)	0.002 (0.513)
GDP Volatility (Squared Cyclical Component of GDP), Average 1990-2011 ^(x)	36.180** (2.450)	78.034 (1.625)	33.693 (1.110)	105.036** (2.082)	0.376 (0.411)	-2.008 (-1.188)	27.232 (0.607)	185.837 (1.043)
Proxy for Political Checks and Balances, Average 1990-2011	-0.003 (-0.132)	0.002 (0.064)	-0.011 (-0.489)	-0.010 (-0.377)	-0.002 (-0.089)	-0.009 (-0.298)	-0.006 (-0.253)	-0.002 (-0.063)
Debt to GDP Ratio, Average 1990-2011	-0.001 (-1.106)	-0.001 (-1.593)	-0.001 (-1.118)	-0.002** (-2.440)	-0.001 (-1.142)	-0.001 (-0.766)	-0.000 (-0.555)	-0.001 (-1.551)
Reserves to Imports Ratio, Average 1990-2011	-0.012 (-1.595)	-0.019 (-1.599)	-0.007 (-1.058)	-0.019* (-1.696)	-0.001 (-0.221)	-0.015 (-1.228)	-0.006 (-0.793)	-0.024* (-1.782)
Constant	0.775*** (5.223)	1.016** (2.550)	0.616*** (3.694)	0.926** (2.382)	0.757*** (4.793)	0.946** (2.389)	0.550*** (3.361)	0.949** (2.032)
Observations	122	71	122	71	122	71	122	71
R-squared	0.342	0.428	0.258	0.432	0.249	0.349	0.187	0.296
r2_a	0.301	0.364	0.212	0.369	0.203	0.277	0.137	0.218
F	8.450	5.133	5.660	5.608	5.405	2.449	3.744	2.917

t-statistics in parentheses

***p<0.01, **p<0.05, *p<0.1

(x) The filter used to compute the cyclical component of GDP is the same as that used for computing the dependent variable

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