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Do Good Institutions Promote Counter-Cyclical Macroeconomic Policies?*

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Abstract

The literature has argued that developing countries are unable to adopt counter-cyclical monetary and fiscal policies due to financial imperfections and unfavorable political-economy conditions. Using a world sample of 115 industrial and developing countries for 1984-2008, we find that the level of institutional quality plays a key role in countries' ability to implement counter-cyclical macroeconomic policies. The results show that countries with strong (weak) institutions adopt counter- (pro-) cyclical macroeconomic policies, reflected in extended monetary policy and fiscal policy rules. The threshold level of institutional quality at which monetary and fiscal policies are a-cyclical is found to be similar.

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1 Introduction

Macroeconomic policies are geared in principle toward stabilizing business-cycle fluctuations. There is ample evidence on the ability of industrial economies to conduct counter-cyclical fiscal policies and, especially, in Europe –see Melitz (2000), and Galí and Perotti (2002). As documented by the estimation of their monetary policy rules, central banks of advanced countries tend to also behave counter-cyclically –e.g. Sack and Wieland, 2007; Lubik and Schorfheide, 2007). More recently, most OECD countries delivered a strong counter-cyclical policy response to the 2008-9 global financial crises by lowering interest rates, implementing unorthodox monetary and credit easing measures, and deploying fiscal stimulus packages (IMF, 2009; OECD, 2009). The cyclical properties of macroeconomic policies in developing countries, on the other hand, are more disputed. Earlier research suggests that monetary and fiscal policies in developing countries –and, especially, in Latin America– are predominantly pro-cyclical (Hausmann and Stein, 1996; Gavin and Perotti, 1997a; Talvi and Végh, 2005 Kaminsky, Reinhart, and Végh, 2004; Ilzetzki and Végh, 2008).[1]

Pro-cyclical policies are conducted by governments that cut taxes and raise spending and by central banks that relax monetary policy during booms while adopting contractionary policies during busts. What drives this destabilizing behavior? According to the literature, the inability to adopt counter-cyclical policies is attributed to the lack of access to funding or political economy distortions.[2] This paper argues that macroeconomic policies can play a key role in stabilizing business cycle fluctuations in countries with stronger institutions.[3] From our viewpoint, differences in the cyclical stance of macroeconomic policies in the global economy may be attributed to differences in their levels of institutional quality.[4]

The main goal of this paper is to test whether the strength of the institutional framework plays a role in the ability of countries to implement counter-cyclical policies. Our conjecture is that countries with weak institutions will be unable to pursue counter-cyclical policies. On the other hand, we anticipate that countries with strong institutions will apply contractionary policies during booms and expansionary policies during recessions. We test empirically this hypothesis using a large panel dataset of up to 112 countries with 25 years of annual data.

[1] In break with history, emerging markets were able to conduct counter-cyclical macroeconomic policies during the recent global financial crisis -especially, on the monetary front (De La Torre *et al.* 2011).

[2] On the fiscal front, the ability to implement counter-cyclical policies is arguably hampered by external borrowing constraints (Gavin and Perotti, 1997b; Calvo and Reinhart, 2000), shallow domestic financial systems (Riascos and Végh, 2003; Caballero and Krishnamurty, 2004), and lack of financial integration (Yakhin, 2008).

[3] Among developing economies, for example Chile, Malaysia, Korea, and Thailand adopted expansionary policies during 2001-2003, a period of cyclical weakness in these economies. More recently, Brazil, Chile, China, India, Korea, and Mexico were among many developing countries that adopted expansionary policies in response to the 2008-2009 global financial crisis and subsequent domestic cyclical weakness.

[4] The developing world comprises a highly heterogeneous group of countries that exhibits large differences in government stability, socioeconomic conditions, rule of law, bureaucratic quality, and corruption, among other measures of institutional quality, which may explain cyclical properties of their macroeconomic policies.

Theoretically, it has been argued that the institutional framework of a country plays a crucial role in the design of macroeconomic policies, supporting our conjecture. On the fiscal front, countries pursuing poor fiscal policies also have weak institutions –say, widespread corruption, lack of enforcement of property rights for investors, repudiation of contracts, and predominance of political institutions that do not constrain their politicians (Acemoglu, Johnson, Robinson and Thaicharoen, 2003).[5] Institutional theories focus on the absence of strong legal and political institutions and the coexistence of different powerful groups in society: common pool problems and fragmentation tend to affect the fiscal authority's decision-making process (Velasco, 1998; Tornell and Lane, 1999; Perotti, 2000). As a result, fiscal policies tend to be pro-cyclical in countries where political systems have multiple fiscal veto points (Braun, 2001; Talvi and Végh, 2005). Moreover, rent-extracting governments that appropriate revenues to serve special interests –instead of public welfare– have a pro-cyclical policy bias (Alesina, Campante and Tabellini, 2008; Ilzetzki, 2007).[6]

Regarding monetary policy, Duncan (2012) shows that a pro-cyclical policy (defined as a negative correlation between the central bank's policy rate and the output gap) is expected in countries with weak institutions. In a New Keynesian environment with foreign investors facing the probability of partial confiscation, weaker institutions reduce the value of the country's external liabilities. Adverse external demand shocks lead to a real depreciation and the subsequent increase in the value of foreign debt is smaller in countries with weak institutions. Given the small wealth effects, real depreciation leads to higher inflation and the central bank raises the policy rate, thus adopting a pro-cyclical policy stance. On the other hand, the wealth effect dominates in countries with stronger institutions: consumption and leisure fall, the labor supply expands and, as a result, wages and inflation decline. Price stabilization then requires the central bank to adopt counter-cyclical action, reducing its policy rate.

Our paper extends previous empirical work, which has focused mainly on fiscal policy, by examining symmetrically the cyclical properties of both monetary and fiscal policy. Monetary and fiscal policy reaction functions in this paper are extensions of standard policy rules found in the literature on Taylor rules (Taylor, 1993a, b; 1995; 2000), fiscal policy rules (Braun, 2001; Lane, 2003b; Taylor 2000) or both (Taylor, 2000; Chadha and Nolan 2007). Specifically, we incorporate the interaction between the business cycle and the strength of the institutional framework in these policy rules. Our main focus is on a broad measure of institutional quality as a key determinant of the policymaker's ability to adopt counter-cyclical fiscal and monetary policies. This paper significantly extend previous work on the role of policy credibility (as proxied by the risk premium on sovereign debt) in the cyclical properties of macroeconomic policies of a smaller set of developing countries –see Calderón and Schmidt-Hebbel (2003) and Calderón, Duncan, and Schmidt-Hebbel (2004).

[5]Weak institutions affect not only the implementation of fiscal policies but also the design of monetary policy. Huang and Wei (2006) show that the credibility effect associated with hard pegs (e.g., currency board arrangement or full dollarization) may not work in countries with weak institutions.

[6]These papers empirically find that less corrupt governments are able to implement counter-cyclical policies.

The empirical assessment is conducted over a larger panel sample that ranges from 1420 to 2381 country-year observations (for monetary and fiscal policy regression equations, respectively). Sensitivity analyses test the robustness of our findings to alternative measures of dependent and explanatory variables as well as different econometric techniques. Among the main findings, we have: (i) the paper robustly finds a relationship among macroeconomic policy stance, business cycle conditions and the strength of the institutional framework. (ii) Countries with strong institutions are able to implement counter-cyclical monetary and fiscal policies. Pro-cyclicality is the norm in countries with weak institutions. (iii) Institutional thresholds required to conduct counter-cyclical policies are similar for both fiscal and monetary policies: approximately 25% of the countries in our sample have an institutional framework strong enough to behave counter-cyclically.

The paper is organized as follows. Section 2 describes the data used in our analysis and presents some stylized facts about the cross-country relations between policy cyclicality and institutional quality. Section 3 presents an empirical approximation to the augmented monetary and fiscal policy rules and discusses our empirical strategy to assess the relationship between the quality of institutions and the cyclical stance of their macroeconomic policies. Our panel data evidence is reported in Section 4. Section 5 concludes.

2 Data and Stylized Facts

This section describes briefly the definition and sources of the data used in our empirical analysis. Then, prior to our econometric assessment, we report some stylized facts on the relationship between macroeconomic policies and institutions found in the world sample. A more detailed description of data sources and construction is provided in the Data Appendix.

We have collected annual data of measures of monetary policy, fiscal policy, real output, exchange rates, and institutions for a world sample of industrial and developing countries. The lack of reliability or availability of data for at least 10 consecutive years restricts our country sample to: (i) 84 countries for the period 1984-2007 in our monetary policy regressions, and (ii) 112 countries for the period 1984-2008 in our fiscal policy regressions.[7]

Table 1 reports the list of 115 countries used at least once in our two sets of regressions. Our sample for the estimation of the monetary policy reaction function is significantly smaller due to the fact that we exclude those country-year observations where monetary independence is fully absent –that is, countries that have adopted hard pegs. According to Ilzetzky, Reinhart and Rogoff (2009), hard peg regimes include full-fledged dollarization (e.g., Ecuador, El Salvador, and Panama) and currency boards (e.g., Estonia and Hong Kong). In the same spirit

[7]For the monetary (fiscal) policy equation, the country distribution is 23 (23) industrial and 61 (89) developing countries. The regional distribution of developing countries is 18 (22) from Latin America and the Caribbean, 10 (11) from East Asia and the Pacific, 4 (4) from South Asia, 11 (13) from Eastern Europe and Central Asia, 8 (16) from the Middle East and North Africa, and 10 (23) from Sub-Saharan Africa.

of Kaminsky *et al.* (2004), we still include country-year observations with soft pegs in the regression sample since they might still have certain degree of monetary independence as long as there is an imperfect substitution between domestic and foreign assets.

This paper uses the interest rate relevant for monetary policy decisions (i.e., reference rate or policy rate) as our indicator for monetary policy. We use the central bank's discount rate for most countries and, if unavailable, we use the money market or the interbank rate. The dependent variable in our monetary policy regression equation is the cyclical component of the policy rate -as defined by the deviation from trend of the (natural log of the) gross nominal interest rate ($\tilde{r}$). On the other hand, the fiscal policy indicator in this paper is the real government expenditure –as suggested by Kaminsky, Reinhart, and Végh (2004).[8] The dependent variable in the fiscal policy regression equation is the cyclical component of real government expenditure –as defined by the deviation from trend path of the (natural log of the) real public expenditure ($\tilde{g}$).

Real output is measured by the real GDP (in local currency at constant prices) and its cyclical component -the output gap- is defined as the deviation from its trend of the (natural log of) real GDP. Domestic inflation is computed as the log differences of the consumer price index (CPI) inflation and its deviation from trend. Local currency depreciation is calculated as the log difference of the nominal exchange rate growth and its deviation from trend. Finally, we should note that the long-run trend paths for all relevant variables are obtained by de-trending the corresponding series using either the Hodrick-Prescott filter or the first-difference filter.

Institutional quality is measured by the International Country Risk Guide (ICRG) political risk index from the Political Risk Services (PRS) Group. The ICRG index, available for our full sample period, considers a wide array of institutional features. Corruption is one of these features and it is used as a political-economy determinant of fiscal pro-cyclicality in recent research (Ilzetzky, 2007; Alesina, Campante, and Tabellini, 2008). The aggregate ICRG index is the sum of 12 partial measures of institutional quality: (a) Government Stability (with a maximum of 12 points), (b) Socioeconomic Conditions (12 points), (c) Investment Profile (12 points), (d) Internal Conflict (12 points), (e) External Conflict (12 points), (f) Corruption (6 points), (g) Military in Politics (6 points), (h) Religious Tensions (6 points), (i) Law and Order (6 points), (j) Ethnic Tensions (6 points), (k) Democratic Accountability (6 points), and (l) Bureaucracy Quality (4 points). Therefore, the ICRG index ranges from 0 (lowest level of institutional quality) to 100 (highest level).

Table 1 reports summary statistics for each country's ICRG index. For our panel, the full panel sample average is 65.8 points, a value close to the time-series sample mean of Brazil (65.9), China (66.0), Mongolia (66.1), or Uruguay (67.7). The highest country-year score is 97 (Switzerland, 1984) and the lowest is 21.8 (Ethiopia, 1992).

[8] Considering that the automatic stabilizing component of government revenue (taxes) is much more significant than that of government expenditure, we follow the latter authors in using government expenditure as a better indicator of discretionary fiscal policy than the government surplus.

We depict the unconditional cross-country relationship between the cyclical behavior of macroeconomic policies and the quality of institutions in Figures 1 and 2. More precisely, these figures show the sample correlation between the cyclical stance of macroeconomic policy and the output gap in the vertical axis and the (average value of the) ICRG institutional index in the horizontal axis. Figure 1 shows the statistically significant link between the degree of cyclicality of monetary policy -the correlation between the cyclical stance of monetary policy (measured by the interest rate deviation from its long-run value) and the output gap- and the average quality of institutions measured by the ICRG Index.[9] This figure shows that there is a positive link between countries with stronger institutions (higher average ICRG index) and their ability to perform counter-cyclical monetary policy (higher correlation between the interest rate deviation and the output gap). Figure 2 illustrates a similar link between the degree of fiscal policy cyclicality and institutional quality in our cross-country sample. This relationship is also statistically significant. As expected, the correlation between the cyclical component of government spending and the output gap tends to fall as the quality of institutions rises. Therefore the ability of governments to use spending as a counter-cyclical fiscal tool is enhanced as the quality of institutions improves.

In sum, our cross-country scatter plots provide preliminary suggestive evidence in support of our hypotheses. However, the latter unconditional correlations do not represent conclusive evidence due to the potential omission of relevant variables that can only be addressed in a full multivariate specification subject to formal testing. This is our next task.

3 Model and Empirical Strategy

This section introduces the empirical model and the strategy to test for the cyclical properties of monetary and fiscal policies in the panel dataset of 112 countries over the period 1984-2008. Monetary policy is specified as an extension of the standard policy or Taylor rule. In addition to standard monetary rule determinants (the lagged dependent variable, the inflation deviation, and the output gap), we include the exchange-rate depreciation as an additional regressor, as validated in empirical studies for several developing and industrial countries.[10] Fiscal policy follows a similar specification but omitting the inflation deviation and exchange-rate depreciation terms (similar to Taylor, 2000).

Regarding our main hypothesis, we introduce an interaction term between the business-cycle variable (the output gap) and the measure of institutional quality in both policy equations.

[9] This is the correlation for the full sample period covering 1984-2007. The output gap is the cyclical component of actual output obtained from de-trended real GDP based on the Hodrick and Prescott (1997) filter. Newey-West HAC corrected standard errors and p-values are reported below each coefficient value of figures 1 and 2.

[10] For industrial countries, Lubik and Schorfheide (2007) find that monetary policy in Canada and the UK reacts in response to exchange-rate movements while it does not in Australia and New Zealand.

At high levels of institutional quality (i.e., higher values of the ICRG index), we expect fiscal and monetary policy to be counter-cyclical. Therefore, we specify the following structural equations for the cyclical stance of monetary and fiscal policy:

$$\tilde{r}_{i,t} = \alpha_0 + \alpha_1 \tilde{r}_{i,t-1} + \alpha_2 \tilde{\pi}_{i,t} + \alpha_3 \tilde{e}_{i,t} + \alpha_4 \tilde{y}_{i,t} + \alpha_5 \tilde{y}_{i,t} Q_{i,t} + u_{i,t} \tag{3.1}$$

$$\tilde{g}_{i,t} = \beta_0 + \beta_1 \tilde{g}_{i,t-1} + \beta_2 \tilde{y}_{i,t} + \beta_3 \tilde{y}_{i,t} Q_{i,t} + v_{i,t} \tag{3.2}$$

where $\tilde{r}$ is the deviation from trend of the nominal interest rate, $\tilde{\pi}$ is the deviation of domestic inflation from its trend path,[11] $\tilde{e}$ is the deviation of currency depreciation from its trend path, $\tilde{y}$ is the real output gap or business cycle measure (as defined by the deviation of real GDP from its trend path), $\tilde{g}$ is the deviation of real government spending from its trend path, and Q is the ICRG index that captures institutional quality. The terms u and v are stochastic disturbances and subscripts i and t denote the country and the time period, respectively.

Regarding our control variables, we expect the coefficients of the lagged dependent variables, α_1 and β_1, to lie between 0 and 1, and both coefficients α_2 (for the inflation rate) and α_3 (for the currency depreciation rate) in the monetary policy equation to be positive. The latter coefficient reflects central bank attempts to smooth exchange rate fluctuations by using their monetary policy instrument, a practice often observed in developing countries but infrequently in industrial economies. Hence we will exclude the exchange-rate depreciation deviation in our base regressions but include it in an alternative set of regressions to test for robustness of our base results.

The inclusion of exchange rate movements in the central bank's monetary policy reaction function merits some further discussion. Taylor (2001) argues that the monetary authority may react to exchange rate shocks indirectly rather than directly –that is, it reacts to the inflation and output effects of shocks to exchange rates. For instance, central bankers will cut policy rates if a shock that strengthens the currency has an adverse impact on aggregate demand (through expenditure switches that encourages imports and discourages exports) and reduces inflation (depending upon the extent of the pass-through.[12] However, it has been argued that central banks may respond to exchange rate movements for different reasons: first, if central banks are prone to adopt *"leaning against the wind"* behavior in the case of asset price bubbles (Cecchetti *et al.* 2000, 2002), and, second, if central banks have *"fear of floating"* and pursue exchange rate stabilization goals –especially, among emerging markets (Mohanty and Klau,

[11] One may argue that expected inflation rather than the current inflation rate should be included as a regressor. To rationalize the inclusion of the latter, we can assume a standard New Keynesian Phillips curve where the current inflation rate depends on expected inflation and output gap. Using this expression, we can reformulate the interest policy rule as a function of current inflation, output gap and parameters that depend on the coefficients of both the original rule and the Phillips curve.

[12] In general, the literature finds that including the exchange rate in a Taylor rule provides negligible improvements in terms of economic stability (Ball, 1999; Taylor, 1999; Leitemo and Soderstrom, 2005).

2004; Eichengreen, 2007). Regardless of the rationale, the exchange rate -either nominal or real- is included as a deviation from its trend.[13] It can also be argued that if real exchange rate deviations from trend are included in the Taylor rule, one can always re-parameterize the monetary policy reaction function in such a way that it depends on deviations from the trend of the nominal exchange rate. The difference between these two specifications is supposed to be picked up by the inflation deviation term and the constant.[14]

We reported in section 2 unconditional estimates of cross-country correlations between policy cyclicality and the quality of institutions, shown in Figures 1 and 2. The model introduced in this section allows for estimation of conditional measures of policy cyclicality in full panel samples, controlling for other policy determinants in the context of behavioral equations. The latter measures are the coefficient estimates that reflect our main hypothesis. The coefficients α_4 and α_5 in the monetary policy function (see equation 1) should be negative and positive, respectively, and statistically significant. At high (low) levels of institutional quality -a high (low) value of the ICRG index- we anticipate monetary policy to be counter- (pro-) cyclical. For the fiscal policy reaction function, β_2 and β_3 should be positive and negative, respectively, and statistically significant. At high (low) levels of quality of institutions, we expect fiscal policy to be counter- (pro-) cyclical.

The specification also allows for calculation of the threshold level of institutional quality that is associated with an a-cyclical policy stance –*i.e.*, a threshold level at which policy is neither counter- nor pro-cyclical.[15] The threshold level is obtained simply by dividing the negative of the output gap coefficient by the interaction term coefficient, a result of setting the partial derivative of the policy rule to the output gap to zero. In the case of monetary policy equation (1), the institutional quality threshold, Q^*, is given by the following condition:

$$\frac{\partial \tilde{r}_{i,t}}{\partial \tilde{y}_{i,t}} = \alpha_4 + \alpha_5 Q^*_{i,t} = 0 \tag{3.3}$$

Our estimate of Q^* is the threshold value of institutional quality that countries would exceed when they adopt counter-cyclical policies; otherwise they would engage in pro-cyclical policies. It is straightforward to infer the cyclical position of monetary policy, dependent on the observed

[13]Clarida, Galí and Gertler (1998) find support for Taylor rules that include deviations of the real exchange rate from the equilibrium. On the other hand, Lubik and Schorfheide (2007) find evidence that the Bank of Canada and the Bank of England tend to react to nominal rather than real exchange rate deviations. Finally, Aizenman, Hutchison and Noy (2011) make the case that central bankers in inflation targeting countries that are commodity exporters tend to react more to real exchange rate shocks. Finally, we run some regressions using deviations from the trend in real rather than nominal exchange rates and the results were qualitatively similar. Those regressions are not reported in this paper but are available from the authors upon request.

[14]This holds provided that the correlation between nominal and real exchange rate is very high or, alternatively, if the foreign CPI inflation (in deviations from its trend) is relatively constant over time.

[15]If α_4 and α_5 are not statistically significant we can also conclude that monetary policy is not only a-cyclical but also irresponsive to changes in the level of institutional quality. A similar argument applies to β_2 and β_3.

level of the institutional quality index Q, from the latter expression:

$$\begin{aligned}
&\text{if } Q > Q^* \equiv -\frac{\alpha_4}{\alpha_5} \Rightarrow \frac{\partial \tilde{r}_{i,t}}{\partial \tilde{y}_{i,t}} > 0 \Rightarrow \text{counter-cyclical policy} \\
&\text{if } Q < Q^* \equiv -\frac{\alpha_4}{\alpha_5} \Rightarrow \frac{\partial \tilde{r}_{i,t}}{\partial \tilde{y}_{i,t}} < 0 \Rightarrow \text{pro-cyclical policy} \\
&\text{if } Q = Q^* \equiv -\frac{\alpha_4}{\alpha_5} \Rightarrow \frac{\partial \tilde{r}_{i,t}}{\partial \tilde{y}_{i,t}} = 0 \Rightarrow \text{a-cyclical policy}
\end{aligned} \tag{3.4}$$

As shown in equation (3), Q^* is determined by the coefficient estimates of our monetary policy equation. Therefore the latter estimates –and hence Q^*– are sample-specific. Below we will compare the difference between our Q^* estimates and actual country Q levels in order to infer about the cyclical properties of macroeconomic policies at the country level. We will derive an analogous threshold level Q^* value from coefficient estimates of equation (2) for fiscal policy.[16]

We use the General Method of Moments estimator with fixed effects (henceforth GMM-FE estimator) for dynamic panel data models as our main estimation method. This estimator controls for possible endogeneity of regressors and avoids biased and inconsistent estimators.[17] To check the validity of the moment conditions specified by our GMM-FE estimator, we perform the Sargan test of over-identifying restrictions, which tests the overall validity of instruments by analyzing the sample analog of the moment conditions used in the estimation process. If we fail to reject the null hypothesis that the conditions hold, we validate our specified regression model.

We test the sensitivity of our results by performing alternative estimations along the following dimensions. First, we report OLS pooled estimation results before turning to our main results based on the GMM-FE estimator.

Second, we use alternative measures for our dependent variable in the monetary policy and fiscal policy equations. We derive two different measures for the policy deviations from their corresponding trend paths. The first measure is based on the deviation of the interest rate (or government spending) from its stochastic trend obtained by using the Hodrick-Prescott (HP) filter. The second is derived by applying first differences to the interest rate (or government spending).

Third, we use three alternative sets of instrumental variables (IV) for both monetary and fiscal policy equations. IV sets are comprised by lagged regressors such that IV Set 1 is a

[16] It can be argued that institutional quality can also affect the way that monetary authorities respond to inflation and depreciation. However, we are unable to find a theoretical model that relates institutional quality and the response of those variables. In addition, we ran some regressions where institutional quality interacts with the deviation from the trend in prices and the exchange rates. However, the results are not statistically significant and the overidentification tests do not validate our regression results. This set of regressions is not reported but is available from the authors upon request.

[17] We use lags of the dependent variable and the regressors as instruments.

subset of IV Set 2, and the latter is a subset of IV Set 3 (see also Table 1). For example, for our fiscal policy rule, set 1 includes $\tilde{g}_{t-2}$, $\tilde{g}_{t-3}$, $\tilde{y}_{t-1}Q_{t-1}$, $\tilde{y}_{t-2}Q_{t-2}$, $\tilde{y}_{t-3}Q_{t-3}$, Q_{t-1}, Q_{t-2}, and Q_{t-3}; set 2 contains set 1 and also $\tilde{y}_{t-4}Q_{t-4}$; and set 3 includes set 2 and also Q_{t-4}. In a similar way, we define the sets of instruments for our monetary policy rule.

Finally, we report monetary policy regression results that include the cyclical component of nominal exchange-rate changes, reflecting potential policy reactions of central banks to large domestic currency shocks.

4 Results

This section reports estimation results for our monetary and fiscal policy equations for the world sample of industrial and developing countries (84) for the period 1984-2008. We use the regression results for calculating the threshold values of institutional quality at which policies are a-cyclical –which we will call "*a-cyclical-policy-index value*" ($APIV$, or Q^* in our methodological discussion)– and depict the conditional relationship between macroeconomic policy cyclicality and institutional quality.

4.1 Monetary Policy Cyclicality and Institutional Quality

Table 2 reports the estimation results for our monetary policy reaction function. We test the sensitivity of our estimated regression to different econometric techniques (pooled OLS and GMM-FE results), different de-trending methods to calculate the cyclical components of the macroeconomic policy variable and regressors (that is, HP filter as opposed to first differences), different specifications (including and excluding the depreciation of the local currency), and different sets of instruments. The coefficient estimates of the monetary policy function display the expected signs and are statistically significant at standard levels. The Sargan test statistic for GMM-FE results confirms that the specification adopted cannot be rejected at conventional levels of significance. Our pooled OLS results do not account for unobserved effects and likely endogeneity. Therefore, our discussion of the econometric results will focus on the GMM-FE coefficient estimates.

The first five columns of Table 2 present the OLS and GMM-FE estimates of the monetary policy reaction function using the HP-filter to obtain the cyclical component of the monetary policy rate (dependent variable) and its determinants (say, inflation, depreciation, and output gap) whereas the last five columns show the results using the first differences as the de-trending method. Given that the HP filter might outperform the first-difference method in separating cyclical and trend components, we will focus our discussion on the results obtained with the former de-trending technique.[18] We use three alternative sets of instruments in our GMM-FE

[18] More specifically, our HP-filter estimates are preferred to those using first differences for the following

estimations of the macroeconomic policy reaction function. As mentioned above, these sets of instruments consist of lagged explanatory variables such as lagged values of the macroeconomic policy tool as well as lagged values of institutional quality, output and its interaction. A more detailed definition of these three different sets of instrumental variables is provided in Section 3. Before discussing the estimation results of our variables of interest, we summarize the main findings for our set of control variables. The inflation rate de-trended by the HP filter induces an increase in the monetary policy rate, with coefficient estimates ranging from 0.25 to 0.28 -see columns [2]-[4] of Table 2. When including the exchange rate deviations from trend as an additional regressor, column [5] of Table 2, we find that the central bank also respond to exchange rate shocks, and this reaction is of smaller order of magnitude than their reaction to inflation shocks. It should also be noted that including the exchange rate deviations from trend in the monetary policy reaction function lowers the size of the inflation coefficient.

In line with the priors of the paper, we find a robust relationship between monetary policy, output gap (our proxy for business cycle conditions) and institutional quality. Specifically, our GMM-FE results yield a negative and significant coefficient for the output gap, and a positive and significant estimate for the interaction between output gap and institutional quality. This implies that monetary policy is significantly counter-cyclical in countries that exhibit high levels of institutional quality while it is pro-cyclical where institutions exhibit low quality. The sign pattern of the estimates enables us to calculate the threshold level at which monetary policy is a-cyclical (Q^*). Our point estimates show that the ICRG level at which monetary policy is a-cyclical is 66 points and the *"a-cyclical-policy-index value" (APIV)* fluctuates within a 95% confidence interval between 56 and 76 points -see column [2] of Table 2. Note that when including exchange rate shocks, our GMM-FE estimates (Table 2, column 5) provide a slightly smaller estimate of Q^* (approximately 64 points) and a slightly larger confidence interval (it fluctuates between 52 and 75 points).

To get a more intuitive sense of our estimations, we identify countries with a-cyclical policies as those whose level of institutional quality fall within the 95% confidence interval of the estimated APIV -that is, [56, 76].[19] Countries with levels of institutional quality that is higher (lower) than the upper (lower) value of the interval tend to conduct counter- (pro-) cyclical monetary policies. Using the mean values of the ICRG political risk index over the period 1984-2008 (see Table 1), approximately 29 countries (out of 115) in our sample exhibited institutional quality above the upper limit of the $APIV$ interval (that is, approximately 25% of our sample). Almost all these countries either belong to the OECD or are high-income economies according to the World Bank classification -for instance, advanced small open economies such as Australia (83.8), Canada (84.6), New Zealand (86.3), and Norway (86.9), Sweden (86.8), and Singapore

reasons: they are based on a filter which is likely to reflect business cycles more properly; they are based on a larger sample; the Sargan test statistic is the lowest; and coefficients for inflation deviations, the output gap, and the interaction term are more precisely estimated.

[19] Approximately half of the sample of countries (59 out of 115) have an average level of institutional quality over the period 1984-2007 that falls within the 95% confidence interval of our estimated $APIV$.

(82.7), as well as dynamic Eastern European nations such as Estonia (75.5), Slovak Republic (77), and Czech Republic (79). On the other hand, 27 countries in our sample (approximately 24%) have institutional quality levels below the lower limit of the $APIV$ interval. This group of countries includes some low-income countries from Sub-Saharan Africa and Asia, and middle-income countries from Latin America -for instance, Ethiopia (44.7), Pakistan (45.4), Uganda (48.8), Indonesia (52.2), Honduras (52.8), Guatemala (54), India (55.2), and Bolivia (55.7).

We should note that over the last 25 years, some middle-income countries have experienced a remarkable improvement in their level of institutional quality. For instance, Chile experienced an increase in the ICRG political risk index from 46 points in 1984 to 79 in 2008. Large increases over the last quarter century were also experienced in Peru (from 43 to 63), the Philippines (from 39 to 61), and Poland (48 to 80). Hence, identifying the countries that are unable to conduct counter-cyclical policies using their average values over the period 1984-2008 may underestimate the current ability of countries that have made marked institutional progress.

4.2 Fiscal Policy Cyclicality and Institutional Quality

Table 3 summarizes regression results for our fiscal policy specification. As in the case of the monetary policy equation, we estimate the fiscal reaction function using different econometric techniques (OLS and GMM-FE), different methods to de-trend our variables (HP filter vis-à-vis first differences), and different instrument sets. As above, we discuss only the GMM-FE results -more specifically, those of column [2]-[4] of Table 3. The Sargan test verifies that the specification cannot be statistically rejected. Coefficient estimates display expected signs and are statistically significant at standard levels.

As in the case of our monetary policy reaction function, the fiscal policy regression results confirm strongly the existence of a significant relation between the fiscal policy stance, the output gap, and the interaction between the output gap and the level of institutional quality. Consistent with the prior of our paper, Table 3 shows that fiscal policy is robustly counter-cyclical in countries that display high levels of institutional quality while it is pro-cyclical in countries with low-quality institutions. This result is robustly reflected by all GMM-FE (as well as OLS) results with a positive and significant estimate for the output gap and a negative and significant coefficient for the interaction between output gap and institutional quality. The point estimates of the threshold level of institutional quality (Q^*) ranges from 67 to 69 points when using the HP filter (columns 2-4, Table 3).[20] Our estimates in column [2] of Table 3 provide a 95% confidence interval for the $APIV$ (or Q^*) that ranges from 65 to 69 points for the ICRG index.

Using the mean values of institutional quality over the period 1984-2008 (in Table 1), we find

[20]The point estimates of the APIV ranges from 71 to 73 when using the first-difference filter (columns 6-8, Table 3).

that 8 countries fall within the 95 percent confidence interval for our estimated $APIV$. Those countries are Trinidad and Tobago, Vietnam, Brazil, China, Mongolia, Uruguay, Oman and Jamaica. On the other hand, more than half of our sample (61 out of 115 countries) exhibited institutional quality index averages below the estimated lower limit of the APIV interval -for instance, Haiti (45.6), Sri Lanka (49.5), Colombia (56), Egypt (57.5), Venezuela (61), Russian Federation (61.5), and Tunisia (63.9). On the other hand, 40% of the countries in our sample have an average level of institutional quality above the upper limit of the APIV interval. It includes many industrial countries but also some dynamic middle-income countries such as Chile (69.2), Poland (70.4), Malaysia (71.3), South Korea (72.2) and Singapore (82.7), among others.

4.3 Macroeconomic Policy Cyclicality and the Quality of Institutions

We note that the point estimates of the threshold or a-cyclical-policy-index value ($APIV$ or Q^*) obtained from our GMM-FE fiscal policy estimations based on the HP filter (columns [2]-[4], Table 3), which range between 66.9 and 68.8 points are only slightly larger than those of the monetary policy reaction function (columns [2]-[4], Table 2), which range between 65.7 and 67 points. Therefore, institutional quality is a stringent constraint for both fiscal and monetary policies. In other words, to adopt a counter-cyclical stance in either monetary or fiscal policy requires a similar degree of institutional development. To have an economic interpretation of the level of institutional development required, approximately 25 countries have an institutional level that is higher than the estimated APIV (66 points). These countries are located approximately in the top quartile of the sample distribution of institutional quality over the period 1984-2008.

Figures 3 and 4 illustrate the response of the stance of macroeconomic policies to institutional quality, conditional on the influence of other determinants included in the policy equations. Using the GMM-FE results reported in columns [2] and [7] of tables 2 and 3 for the monetary and fiscal policy equations, respectively, we calculate the response of macroeconomic policies to the output gap at different levels of institutional quality. For a range of institutional quality that spans from the minimum average country value to 100 points, we set a grid of levels of institutional quality. Then we calculate the cyclical degree of macroeconomic policies, conditional on the values of the grid. The corresponding results are depicted in figures 3 and 4 for monetary and fiscal policy. We note three comparative results. First, while the relations between policy cyclicality and institutional quality based on the HP and first-difference filters differ somewhat for monetary policy, they are very close for fiscal policy. Second, as noted above, the Q^* threshold level (at which the corresponding schedule crosses the horizontal line that marks an a-cyclical policy stance in figures 3 and 4) based on HP-filter equation (2), is 66 points for monetary policy, which is slightly similar to the 67 points obtained for fiscal policy. Finally, the sensitivity of monetary policy cyclicality to institutional quality –reflected by the absolute value of the first derivative of the policy schedules– is much smaller than is the case of fiscal policy.

4.4 Other Robustness Checks

Table 4 presents further sensitivity analysis to our estimation of the monetary and fiscal policy reaction functions. First, we re-run our regressions for the sample of developing countries (i.e. emerging markets and less developed economies). Second, we investigate the channels of transmission through which institutional quality affects the conduct of macroeconomic policy over the cycle. More specifically, we examine the sensitivity of our results to different components of the overall ICRG political risk index: (a) the ICRG sub-index I that takes values between 0 and 40 and comprises information on government stability, investment profile, corruption, law and order, and bureaucracy quality; and, (b) the ICRG sub-index II that takes values between 0 and 18 and that incorporates data on government stability and corruption.[21] Finally, we also test the robustness of our results to a third trend-cycle decomposition method: the Band-Pass filter (Baxter and King, 1999).

Monetary Policy. When adjusting our monetary policy regression equation for the sample of developing countries –columns [1] and [2] of Table 4– we find again that rising inflation (as proxied by higher deviations of the inflation rate from the trend) would lead to a hike in the monetary policy rate by the Central Bank in developing countries. Regarding our variable of interest, output gap enters with a negative and significant coefficient in our regression whereas the interaction terms between output gap and institutional quality is still positive and significant. This result is consistent with that of the full sample of countries and with our hypothesis that developing countries with strong institutions will be able to conduct counter-cyclical monetary policy. Interestingly, the point estimate of threshold level for institutions (Q^*) is similar to that found for the full sample of countries (approximately, 66 points). Note, however, that the upper values of the 95% confidence intervals are lower than those obtained with the full sample. Naturally, this reflects the fact that most emerging markets and less developed economies show lower average levels of institutional quality than those of developed countries.

Next, we investigate the type of institutions that are important to explain the mechanism that links institutional quality and the cyclicality of monetary policy. Hence, we replace the ICRG political risk index (that fluctuates between 0 and 100 points) by: (a) the ICRG sub-index I that comprises information on government stability, investment profile, corruption, law and order and bureaucracy quality (and ranges from 0 to 40), and (b) the ICRG sub-index II that includes government stability and corruption (and takes values between 0 and 18). For

[21]We test for different combinations of ICRG subindices and we found that the sub-indices I and II (as defined above) were significant in explaining the cyclicality of monetary and fiscal policy, respectively. Other combinations, however, did not provide statistically significant estimates, expected signs or failed to reject the null of the validity of instruments (Sargan tests).

the ICRG sub-index I we find a robust relationship between monetary policy, output gap and institutions that is consistent with the prior of this paper: counter-cyclical monetary policy can be implemented in countries with high institutions. Point estimates of the threshold value of the ICRG sub-index I (Q_1^*) render a level of approximately 24 points, and our regression results also yield a 95% confidence interval for Q_1^* that goes from 20 to 28 points.

Finally, our monetary policy regression equation is estimated for the full sample of countries but the deviations from trend for the policy variable as well as its determinants are computed using the band-pass filter. Table 4 robustly finds a relationship among monetary policy, output gap and institutional quality that is consistent with our prior. Countries with stronger institutions are better built to conduct counter-cyclical monetary policy. The point estimate of Q^* (70 points) is higher than when calculating with the other de-trending techniques –and Q^* fluctuates between 66 and 74 points (in a 95% confidence interval).

The transmission mechanism from institutions to pro-cyclicality of monetary policy can be inferred from the theoretical model proposed by Duncan (2012). Countries with weaker institution (government instability, low investment profile, corruption, low quality of law and order and bureaucracy) tend to attract less foreign direct and financial investment and have lower levels of external liabilities. In this context, adverse external demand shocks would lead to a real depreciation, an insignificant increase in the value of foreign debt, and higher inflation. The central bank raises the policy rate, thus adopting a pro-cyclical policy stance (a negative co-movement between output and the policy rate). In countries with stronger institutions and, therefore, higher external liabilities, the real depreciation generates a significant wealth effect that dominates. Consumption and leisure fall due to the increase in the real value of foreign debt. The labor supply expands and, as a result, wages and inflation decline. Price stabilization then requires the central bank to adopt counter-cyclical action and reduce its policy rate.

Fiscal Policy. In an analogous fashion, we run the sensitivity tests for the fiscal policy regression equation. We first find that the inference on the cyclicality of fiscal policy for the full sample of countries holds for the group of developing countries. The coefficient of output gap is positive and significant while that of the interaction term between output gap and institutional quality is negative and significant. That is, government spending is counter-cyclical in countries with stronger institutions. The point estimate of the *a-cyclical-policy-index value* (Q^*) is approximately 64 points (column [6], Table 4), which is slightly smaller than that obtained for the full sample of countries –that is, 67 points (column [2], Table 3).

An investigation into the channels of transmission of institutions to policy cyclicality shows that the estimates hold when replacing the ICRG overall index with the ICRG sub-index II. Again, fiscal policy can be conducted counter-cyclically in countries with strong institutions, and the point estimate of Q_2^* is approximately 12. Explaining the cyclicality of fiscal policies using political economy models requires the introduction of frictions. In this case, a strand of the literature shows that successive governments with different preferences may introduce a political distortion that leads to excessive accumulation of debt with respect to a time-consistent fiscal authority (Alesina and Tabellini, 1990; Alesina *et al.*, 2008; Ilzetzki, 2007). If the political structure is polarized, the incumbent government will not have incentives to save resources as the successor will not necessarily value the same constituency as he does. Fiscal savings from the incumbent government may favor a different political faction. Rent-seeking behavior for the benefit of its own constituency will lead the government to save less and spend more when more tax revenues are available, thus making fiscal policy pro-cyclical (Ilzetzki, 2007).

Finally, the findings of our paper are robust to changes in the detrending technique used. That is, the main message of this paper (i.e., countries with stronger institutions are capable of conducting counter-cyclical fiscal policy) still holds when using the band-pass filter to detrend government spending as well as its determinants.

5 Conclusions

There is ample evidence on the ability of industrial economies to conduct counter-cyclical fiscal and monetary policies. In contrast, most developing countries are unable to implement counter-cyclical macroeconomic policies. The literature argues that the inability of developing countries to adopt optimal (counter-cyclical) stabilization policies is attributed to external borrowing constraints, fragile domestic financial systems, high levels of foreign-currency denominated liabilities, interactions between domestic and external financial imperfections, political-economy constraints, lack of policy credibility, corruption, and imperfect information about government programs.

This paper complements and improves upon the existing evidence on the cyclicality of fiscal and monetary policies in developing countries by arguing that macroeconomic policies play a key role in stabilizing business-cycle fluctuations in countries with stronger institutions. This paper has extended previous empirical work –mainly conducted on fiscal policy– by focusing symmetrically on the cyclicality of both fiscal and monetary policies. Our specification of the fiscal and monetary policy regression equations is based on an extension of standard policy rules found in the literature: they include an interaction between the output gap and an indicator of institutional development.

The main goal of this paper is to investigate the role of a broad measure of institutional quality –that includes corruption among many other components– as a key determinant of the policymaker's ability to adopt counter-cyclical fiscal and monetary policies. To accomplish this task we have assembled a large panel data set of up to 112 countries with annual data over the last quarter century –that is, from 1984 to 2008. We use GMM techniques to empirical examine our null hypothesis and our estimates support our priors.

The empirical evidence presented in this paper strongly confirms the existence of a significant relationship among the macroeconomic policy stance, business-cycle conditions (as measured by the output gap) and the interaction between the business cycle and the quality of institutions. Our findings show that both monetary and fiscal policies are significantly counter-cyclical in countries that exhibit high levels of institutional quality while they tend to be pro-cyclical in countries with weaker institutional settings. In addition, the threshold levels of institutional quality at which fiscal and monetary policies are neutral to the business cycle (a-cyclical policy index value, or $APIV$) are quite similar. Our preferred regression results show that the $APIV$ for the monetary policy regression is 66 points while it is equal to 67 points for the fiscal policy regression. This implies that one out of four countries in our sample (approximately 25%) has a level of institutional quality that enables them to conduct counter-cyclical policies. This group of countries is mostly high-income economies -and, especially, OECD countries. In sum, adopting a counter-cyclical stance in macro policy requires a high degree of institutional development.

6 Appendix

Nominal interest rate ($\tilde{r}$): Cyclical component of the log of gross nominal central bank's discount rate. It is expressed in percent deviations from trend. When the discount rate is not available, money market or interbank rates are used. Source: International Financial Statistics (IFS), International Monetary Fund (IMF), codes 60 and 60B.

Government spending ($\tilde{g}$): Cyclical component of the log of real government spending. It is expressed in percent deviations from trend. Source: national accounts, IFS (IMF).

Output gap ($\tilde{y}$): Cyclical component of the log of real GDP. Source: IFS (IMF).

Inflation rate ($\tilde{\pi}$): Cyclical component of the log of the gross CPI inflation rate. It is expressed in percent deviations from trend. Source: IFS (IMF).

Depreciation rate ($\tilde{e}$): Cyclical component of the log of the gross nominal exchange-rate depreciation rate. It is expressed in percent deviations from trend. Nominal exchange rate expressed as the value of the domestic currency per US dollar. For the United States, an index constructed on a basket of currencies is used. Source: IFS (IMF).

The **cyclical components** are obtained from de-trending the variables using the Hodrick-Prescott (*HP*) first, the first-difference filter (*First Diff*), and the Band-Pass (*BP*) due to Baxter and King (1999). We set the smoothing parameter value of the HP filter using the frequency power rule of Ravn and Uhlig (2002).

Institutional Quality: Political risk index from the International Country Risk Guide (ICRG). The ICRG index ranges from 0 (the lowest level of institutional quality) to 100 (the highest level) and has 12 components: (a) Government Stability (with a maximum of 12 points), (b) Socioeconomic Conditions (12 points), (c) Investment Profile (12 points), (d) Internal Conflict (12 points), (e) External Conflict (12 points), (f) Corruption (6 points), (g) Military in Politics (6 points), (h) Religious Tensions (6 points), (i) Law and Order (6 points), (j) Ethnic Tensions (6 points), (k) Democratic Accountability (6 points), and (l) Bureaucracy Quality (4 points). Source: Political Risk Service (PRS) Group. The ICRG index is reported at monthly frequency; thus we compute the annual average for the corresponding year. Finally, we construct two different subindexes of institutional quality: *Subindex I* is composed of the subindexes of Government Stability, Investment Profile, Corruption, Law and Order, and Bureaucracy Quality (it ranges from 0 to 40). *Subindex II* is composed of the subindexes of Government Stability and Corruption (it ranges from 0 to 18).

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Figure 1. Output - Interest Rate Correlation and ICRG Average

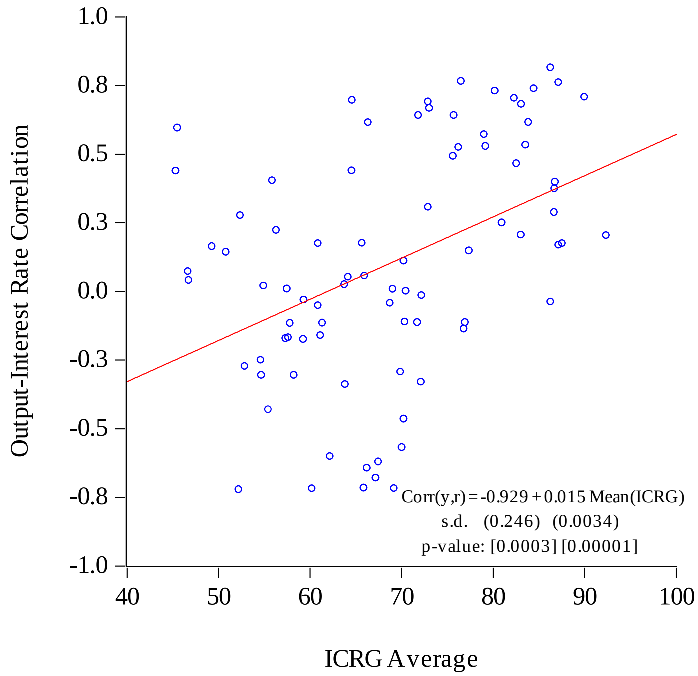

Figure 2. Output - Government Spending Correlation and ICRG Average

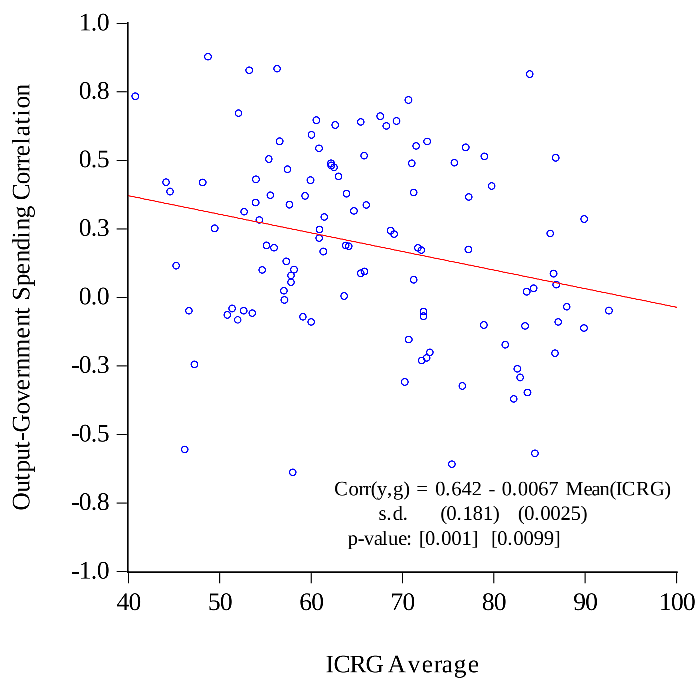

Figure 3. Cyclical Behavior of Monetary Policies

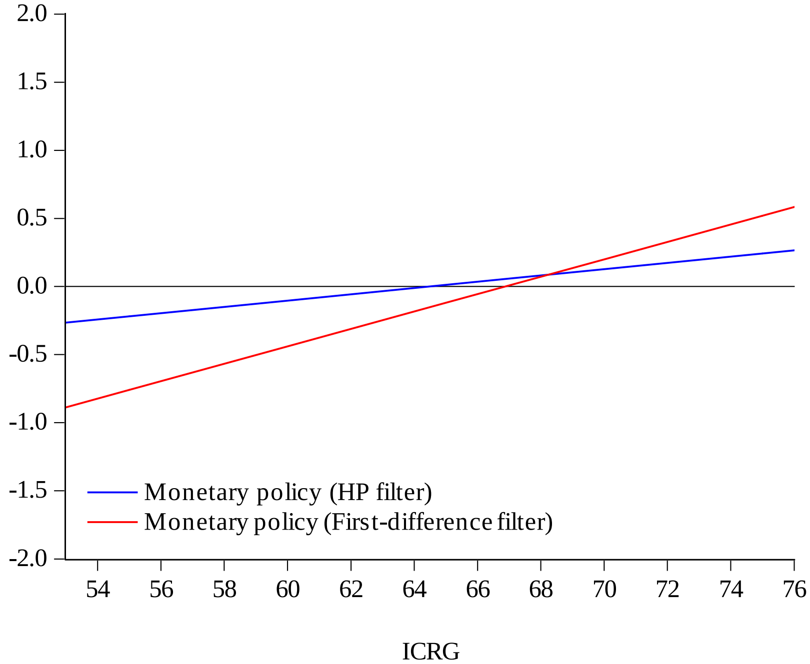

Figure 4. Cyclical Behavior of Fiscal Policies

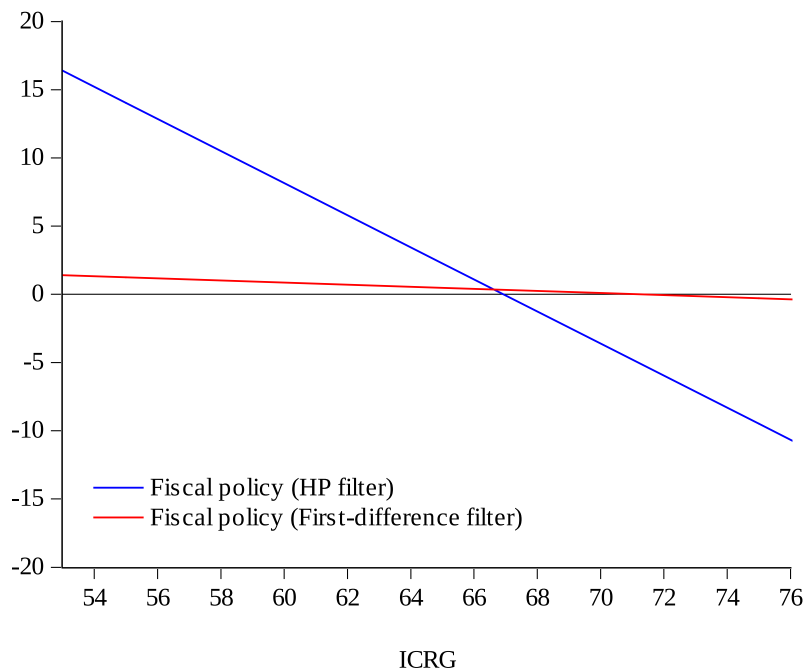

TABLE 1

Summary statistics of institutional quality by countries (ICRG Index, different periods from 1984 to 2008)

Country	*Mean*	*Median*	*Maximum*	*Minimum*	*Std. Dev.*	*Observations*
Albania	60.3	60.1	68.3	51.2	5.1	10
Argentina	70.7	72.1	76.4	59.2	5.3	16
Australia	83.8	85.2	88.8	75.4	4.2	25
Austria	86.6	86.8	91.6	80.1	2.5	25
Bahamas, The	83.5	84.0	86.4	79.6	2.0	12
Bahrain	64.2	64.9	77.7	50.0	10.4	25
Bangladesh	46.3	49.6	63.2	28.6	11.4	22
Belarus	61.0	61.3	64.3	57.2	2.0	11
Belgium	81.4	81.3	86.8	76.8	3.0	25
Bolivia	55.7	57.7	69.6	32.8	11.4	25
Botswana	72.4	73.3	78.5	64.5	4.7	25
Brazil	65.9	66.0	69.8	59.8	2.2	25
Bulgaria	71.1	71.6	76.2	62.3	3.0	18
Burkina Faso	55.5	53.8	65.4	42.3	7.1	22
Cameroon	52.7	51.6	64.4	45.3	4.7	23
Canada	84.6	85.8	89.9	79.9	2.9	25
Chile	69.2	73.1	81.8	43.5	12.5	25
China	66.0	67.8	72.3	56.9	4.1	25
Colombia	56.0	57.2	62.9	48.7	4.5	25
Congo, Rep.	50.9	52.4	56.3	41.9	4.7	16
Costa Rica	71.8	72.3	81.7	62.0	5.9	25
Croatia	72.2	74.1	75.5	65.7	3.8	10
Cyprus	70.8	75.3	82.8	49.4	11.6	25
Czech Republic	79.1	78.5	84.3	72.2	3.1	16
Denmark	87.2	86.2	93.3	82.2	3.2	25
Dominican Republic	61.0	63.8	71.5	49.8	7.8	25
Ecuador	58.2	57.8	64.0	54.0	2.6	25
Egypt, Arab Rep.	57.9	62.3	66.4	42.0	8.3	24
El Salvador	62.7	67.1	74.7	35.8	12.0	17
Estonia	75.5	75.0	77.2	74.2	1.0	11
Ethiopia	44.7	45.1	62.9	21.8	14.5	20
Finland	89.9	91.8	94.6	81.3	4.3	25
France	79.0	79.0	81.9	75.3	1.8	25
Germany	84.0	84.4	89.0	74.5	3.3	25
Ghana	54.8	55.5	65.8	38.3	10.1	14
Greece	71.3	74.6	83.2	58.4	8.0	25
Guatemala	54.0	61.5	69.8	30.2	13.8	25
Guinea-Bissau	47.3	46.0	57.0	42.5	4.6	21
Guyana	56.6	63.0	74.3	36.0	14.6	21
Haiti	45.6	45.5	52.8	39.0	4.7	11
Honduras	52.8	55.8	66.4	34.9	9.9	25
Hong Kong, China	72.7	72.5	83.1	54.2	7.4	25
Hungary	77.4	77.7	86.2	70.0	4.3	25
Iceland	86.9	88.3	91.5	79.2	4.1	25
India	55.2	56.3	65.5	34.8	8.5	25
Indonesia	52.2	50.4	66.9	39.8	8.6	25
Iran	53.7	59.8	67.9	28.5	13.8	24
Ireland	84.4	86.2	92.3	74.3	5.3	25
Israel	57.7	61.0	71.5	35.8	10.2	25
Italy	77.3	77.9	84.6	67.8	4.2	25
Jamaica	68.8	70.5	78.9	54.3	6.7	25
Japan	83.7	83.6	92.8	78.3	4.1	25
Jordan	62.3	69.3	74.8	39.2	13.0	25
Kenya	57.4	56.5	67.9	48.7	5.5	23
Korea, Rep.	72.2	74.5	79.8	60.0	6.5	25
Kuwait	72.4	72.7	78.4	63.9	4.1	16
Latvia	73.1	74.7	77.8	65.0	4.3	11
Libya	54.1	58.2	67.2	35.3	10.8	22
Lithuania	72.8	75.5	78.1	65.0	4.9	11
Luxembourg	92.7	93.0	94.7	88.0	1.5	25
Madagascar	59.4	59.3	67.3	46.0	4.4	25
Malawi	58.1	55.2	75.0	49.8	7.6	22
Malaysia	71.3	72.0	79.4	59.8	5.3	25
Mali	44.2	40.6	57.7	36.2	8.6	12
Malta	76.7	84.2	87.6	55.0	12.8	22
Mexico	69.5	69.5	75.5	61.5	3.6	25
Mongolia	66.1	67.7	72.4	58.4	4.8	23
Morocco	62.3	68.8	73.8	40.0	11.6	24
Mozambique	54.4	57.0	69.2	40.4	9.5	24
Myanmar	46.8	48.2	58.6	27.0	8.6	13
Namibia	71.6	76.5	80.9	39.1	12.5	15
Netherlands	88.1	87.0	96.1	82.2	4.1	25
New Zealand	86.3	86.7	90.9	77.8	3.7	25
Nicaragua	60.7	63.0	67.5	43.7	6.7	18
Niger	51.5	53.3	60.9	37.0	7.1	19
Nigeria	46.8	46.9	54.3	38.8	4.9	20
Norway	86.9	87.8	93.3	79.8	3.4	25
Oman	68.3	72.3	77.0	54.0	8.8	24
Pakistan	45.4	44.7	62.9	30.7	7.9	25
Panama	60.1	58.8	75.8	42.7	13.5	24
Papua New Guinea	60.0	60.1	66.4	53.5	4.4	21
Paraguay	59.2	56.9	72.0	46.4	8.0	25
Peru	53.3	59.7	68.3	38.3	10.6	25
Philippines	56.4	63.1	73.6	36.9	12.5	22
Poland	70.4	75.0	86.6	47.2	11.6	25
Portugal	79.9	83.2	90.6	69.9	7.4	25
Qatar	63.1	68.4	77.5	23.2	13.6	23
Romania	63.7	68.3	76.2	45.3	9.0	25
Russian Federation	61.5	64.2	68.3	49.8	6.3	14
Saudi Arabia	62.6	66.3	70.0	49.3	7.4	25
Senegal	57.1	57.7	61.1	52.5	2.8	18
Sierra Leone	40.8	40.8	55.9	25.0	9.3	19
Singapore	82.7	83.8	89.1	76.3	4.4	25
Slovak Republic	77.0	76.7	81.9	71.2	3.0	16
South Africa	64.8	65.1	75.0	49.3	7.4	25
Spain	75.8	76.2	82.7	67.5	4.6	25
Sri Lanka	49.5	53.5	62.2	29.3	10.3	25
Sweden	86.8	87.3	91.6	79.5	3.8	25
Switzerland	90.0	89.3	97.0	84.9	3.5	25
Syrian Arab Republic	57.2	60.0	70.0	31.7	11.9	24
Tanzania	61.4	61.9	68.1	52.5	4.9	19
Thailand	64.0	65.0	75.3	54.5	6.6	25
Togo	48.2	47.0	55.5	36.0	5.4	21
Trinidad and Tobago	65.5	65.0	74.8	55.8	6.2	25
Tunisia	63.9	67.8	75.0	44.3	10.8	22
Turkey	57.5	58.1	69.3	43.5	7.4	22
Uganda	48.8	53.8	60.0	29.3	9.4	25
United Kingdom	83.0	81.8	90.3	76.3	4.4	25
United States	82.3	81.8	91.5	74.9	4.1	25
Uruguay	67.7	67.3	79.0	56.0	6.2	25
Venezuela, RB	61.0	62.8	75.8	48.8	7.3	25
Vietnam	65.6	66.5	71.6	50.6	5.4	18
Yemen, Republic of	60.1	61.3	67.3	49.2	4.8	16
Zambia	57.9	62.5	72.1	43.3	9.7	25
Zimbabwe	52.1	50.3	67.2	34.3	10.6	21
Full sample average	65.8	67.3	75.2	53.2	6.9	22

Source: The PRS Group - "International Country Risk Guide (ICRG)," Various issues. Authors' calculations.

TABLE 2

Cyclical Degree of Monetary Policy

Dependent Variable: Nominal Interest Rate (NIR), Percent Deviations from its Trend

Estimation Method: Generalized Method of Moments (GMM) and Ordinary Least Squares (OLS) †*

Sample: 84 countries, 1984-2007 (unbalanced panel)

	HP-Filter deviations from the trend					*First Differences*				
Regressors	*Pooled OLS [1]*	*GMM-FE IV Set 1 [2]*	*GMM-FE IV Set 2 [3]*	*GMM-FE IV Set 3 [4]*	*GMM-FE (w/ depreciation) [5]*	*Pooled OLS [6]*	*GMM-FE IV Set 1 [7]*	*GMM-FE IV Set 2 [8]*	*GMM-FE IV Set 3 [9]*	*GMM-FE (w/ depreciation) [10]*
Lagged dependent variable	-0.073	0.307	0.253	0.255	0.492	-0.048	-0.284	-0.239	-0.230	-0.221
standard error	(0.040)	(0.133)	(0.130)	(0.129)	(0.134)	(0.035)	(0.079)	(0.089)	(0.092)	(0.106)
p-value	(0.069)	(0.021)	(0.051)	(0.049)	(0.000)	(0.175)	(0.000)	(0.007)	(0.013)	(0.038)
Inflation rate, percent deviations from trend	0.267	0.255	0.275	0.274	0.126	0.263	0.393	0.370	0.367	0.321
standard error	(0.030)	(0.086)	(0.086)	(0.085)	(0.073)	(0.028)	(0.031)	(0.035)	(0.036)	(0.054)
p-value	0.000	(0.003)	(0.002)	(0.001)	(0.087)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Depreciation, percent deviations from trend	...	...	...	...	0.029	...	...	...	...	0.050
standard error	...	...	...	...	(0.013)	...	...	...	...	(0.019)
p-value	...	...	...	...	(0.023)	...	...	...	...	(0.011)
Output gap	-0.244	-1.483	-1.649	-1.613	-1.593	-0.156	-4.280	-3.602	-3.471	-3.655
standard error	(0.133)	(0.681)	(0.665)	(0.659)	(0.713)	(0.065)	(0.545)	(0.589)	(0.617)	(1.419)
p-value	(0.066)	(0.030)	(0.013)	(0.015)	(0.026)	(0.016)	(0.000)	(0.000)	(0.000)	(0.010)
Output gap x Institutional quality index	0.004	0.023	0.025	0.024	0.025	0.003	0.064	0.053	0.051	0.052
standard error	(0.002)	(0.009)	(0.009)	(0.009)	(0.009)	(0.001)	(0.008)	(0.008)	(0.008)	(0.016)
p-value	(0.015)	(0.010)	(0.004)	(0.005)	(0.008)	(0.001)	(0.000)	(0.000)	(0.000)	(0.001)
Statistics										
F-Statistic	3.627	...	...	...	...	4.408	...	...	...	...
(p-value)	(0.000)	...	...	...	...	(0.000)	...	...	...	...
Sargan statistic	...	6.509	10.158	10.123	10.797	...	12.086	13.063	15.753	1.153
(p-value)	...	(0.590)	(0.338)	(0.430)	(0.213)	...	(0.209)	(0.220)	(0.151)	(0.562)
N° of observations	1420	1058	1058	1058	1078	1336	916	916	916	914
Cross-sections included	84	84	84	84	84	84	84	84	84	84
Average time span	17	13	13	13	13	16	11	11	11	11
Acyclical-Policy Index Value (*Q**)	56.0	65.7	67.3	67.0	63.8	51.4	67.3	67.3	67.6	70.5
95%-Confidence interval[c]	[38.7 73.4]	[56.0 75.5]	[59.7 74.8]	[59.2 74.9]	[52.4 75.2]	[35.3 67.5]	[61.9 72.7]	[61.6 73.1]	[61.5 73.8]	[56.1 84.9]

*Notes: *GMM estimations were performed including fixed effects. White standard errors and covariances were computed. Instrumental variables are sets composed of lagged regressors such that IV set 1 is a subset of IV set 2 and this, in turn, a subset of IV set 3. IV sets are composed of lagged values of r(t-1), pi(t), y(t), y(t)*Q(t), e(t) (if included), and Q(t), up to, depending on the specification, the fifth lag. See main text for the notation of variables. Hodrick-Prescott and first-difference filters are used to extract the cyclical components of the dependent variable and regressors (except Q(t)). †Pooled EGLS (cross section weights). White standard errors and covariances were computed. c. Confidence intervals for the acyclical policy index were computed using analytic derivatives and the delta method.*

TABLE 3

Cyclical Degree of Fiscal Policy
Dependent Variable: Government Spending, Percent Deviations from its Trend
Estimation Method: Generalized Method of Moments (GMM) and Ordinary Least Squares (OLS) †*
Sample: 112 countries, 1984-2008 (unbalanced panel)

	HP-Filter deviations from the trend				*First Differences*			
Regressors	*Pooled OLS [1]*	*GMM-FE IV Set 1 [2]*	*GMM-FE IV Set 2 [3]*	*GMM-FE IV Set 3 [4]*	*Pooled OLS [5]*	*GMM-FE IV Set 1 [6]*	*GMM-FE IV Set 2 [7]*	*GMM-FE IV Set 3 [8]*
Lagged dependent variable	0.077	0.759	0.811	0.709	0.044	0.798	0.741	0.872
standard error	(0.027)	(0.475)	(0.327)	(0.272)	(0.023)	(0.254)	(0.212)	(0.196)
p-value	(0.004)	(0.110)	(0.013)	(0.009)	(0.057)	(0.002)	(0.001)	(0.000)
Output gap	1.905	78.779	54.013	45.156	1.375	5.548	5.507	4.901
standard error	(0.218)	(38.484)	(23.272)	(18.371)	(0.225)	(2.091)	(1.940)	(2.195)
p-value	(0.000)	(0.041)	(0.020)	(0.014)	(0.000)	(0.008)	(0.005)	(0.026)
Output gap x Institutional quality index	-0.022	-1.177	-0.798	-0.656	-0.013	-0.078	-0.075	-0.067
standard error	(0.003)	(0.576)	(0.344)	(0.268)	(0.003)	(0.036)	(0.034)	(0.038)
p-value	(0.000)	(0.041)	(0.021)	(0.014)	(0.000)	(0.033)	(0.026)	(0.081)
Statistics								
F-Statistic	2.246	...	...	...	4.355	...	...	...
p-value	(0.000)	...	...	...	(0.000)	...	...	...
Sargan statistic	...	1.441	7.992	9.136	...	6.114	6.885	6.875
p-value	...	(0.920)	(0.239)	(0.243)	...	(0.191)	(0.229)	(0.333)
N° of observations	2381	2157	2045	2045	2269	1709	1709	1709
Cross-sections included	112	112	112	112	112	112	112	112
Average time span (years)	21	19	18	18	20	15	15	15
Acyclical-Policy Index Value (Q^*)	88.6	66.9	67.7	68.8	108.3	71.3	73.4	73.5
95%-Confidence interval[c]	[81.2 95.9]	[65.3 68.6]	[66.1 69.3]	[67.2 70.5]	[89.4 127.2]	[49.8 92.9]	[51.7 95.0]	[51.7 95.2]

*Notes: *GMM estimations were performed including fixed effects. White standard errors and covariances were computed. Instrumental variables are sets composed of lagged regressors such that IV set 1 is a subset of IV set 2 and this, in turn, a subset of IV set 3. IV sets are composed of lagged values of g(t-1), y(t), y(t)*Q(t), and Q(t), up to, depending on the specification, the fifth lag. See main text for the notation of variables. Hodrick-Prescott and first-difference filters are used to extract the cyclical components of the dependent variable and regressors (except Q(t)). †Pooled EGLS (cross section weights). White standard errors and covariances were computed. c. Confidence intervals for the acyclical policy index were computed using analytic derivatives and the delta method.*

TABLE 4

Additional Robustness Checks

Dependent Variables: Nominal Interest Rate and Government Spending (Percent Deviations from Trend)

*Estimation Method: Generalized Method of Moments (GMM)**

Sample: 84 countries, 1984-2007 (monetary policy), 112 countries, 1984-2008 (fiscal policy), (unbalanced panels).

	Monetary Policy Reaction Function					*Fiscal Policy Reaction Function*				
	Developing Countries		*Full Sample*			*Developing Countries*		*Full Sample*		
Regressors	*ICRG Index HP Filter [1]*	*ICRG Index First Differences [2]*	*ICRG Sub-Index 1 HP Filter [3]*	*ICRG Sub-Index 1 First Differences [4]*	*ICRG Index BP Filter [5]*	*ICRG Index HP Filter [6]*	*ICRG Index First Differences [7]*	*ICRG Sub-Index 1 HP Filter [8]*	*ICRG Sub-Index 1 First Differences [9]*	*ICRG Index BP Filter [10]*
Lagged dependent variable	0.301	-0.298	0.315	-0.251	0.015	0.695	0.634	0.788	0.941	0.025
standard error	(0.173)	(0.080)	(0.143)	(0.078)	(0.071)	(0.244)	(0.185)	(0.119)	(0.271)	(0.048)
p-value	(0.083)	(0.000)	(0.028)	(0.001)	(0.831)	(0.005)	(0.001)	(0.000)	(0.001)	(0.596)
Inflation rate, percent deviations from trend	0.178	0.399	0.264	0.344	0.321	...	...	...	...	...
standard error	(0.098)	(0.029)	(0.094)	(0.050)	(0.089)	...	...	...	...	...
p-value	(0.070)	(0.000)	(0.005)	(0.000)	(0.000)	...	...	...	...	...
Output gap	-7.979	-5.377	-1.557	-2.194	-5.001	56.320	5.441	6.754	6.292	5.603
standard error	(3.964)	(1.590)	(0.782)	(0.528)	(2.713)	(20.564)	(1.983)	(2.534)	(3.233)	(2.434)
p-value	(0.045)	(0.000)	(0.047)	(0.000)	(0.066)	(0.006)	(0.000)	(0.008)	(0.000)	(0.021)
Output gap x Institutional quality index	0.121	0.083	...	...	0.071	-0.881	-0.082	...	...	-0.083
standard error	(0.060)	(0.022)	...	...	(0.038)	(0.322)	(0.032)	...	...	(0.040)
p-value	(0.045)	(0.000)	...	...	(0.058)	(0.006)	(0.010)	...	...	(0.037)
Output gap x Institutional quality subindex	...	...	0.065	0.093	...	...	...	-0.575	-0.488	...
standard error	...	...	(0.028)	(0.015)	...	...	...	(0.225)	(0.279)	...
p-value	...	...	(0.020)	(0.000)	...	...	...	(0.011)	(0.081)	...
Statistics										
Sargan statistic	7.034	6.983	10.764	8.859	6.808	6.131	8.196	4.613	4.717	3.827
p-value	(0.425)	(0.322)	(0.215)	(0.182)	(0.339)	(0.525)	(0.146)	(0.465)	(0.451)	(0.281)
Nº of observations	644	536	1078	911	1000	1541	1453	2150	1708	1933
Cross-sections included	54	54	84	84	84	88	88	112	112	112
Average time span	12	10	13	11	12	18	17	19	15	17
Acyclical-Policy Index Value (Q*)	65.8	65.2	23.8	23.7	70.0	63.9	66.3	11.8	12.9	67.2
95%-Confidence interval†	[62.5 69.1]	[59.3 71.0]	[20.0 27.7]	[19.4 27.9]	[66.0 74.0]	[61.8 66.0]	[52.6 80.0]	[11.1 12.4]	[10.6 15.2]	[59.6 74.8]

*Notes: *GMM estimations were performed including fixed effects. White standard errors and covariances were computed. Instrumental variables are sets composed of lagged values of lagged dependent variable and regressors, up to, depending on the specification, the fifth lag. Hodrick-Prescott (HP), first-difference (First-Diff), and Band-Pass (BP, due to Baxter-King (1999)) filters are used to extract the cyclical components of the dependent variable and regressors (except Q(t)). Subindex I is composed of the subindexes of Government Stability, Investment Profile, Corruption, Law and Order, and Bureaucracy Quality (it ranges from 0 to 40). Subindex II is composed of the subindexes of Government Stability and Corruption (0-18). †Confidence intervals for the acyclical policy index were computed using analytic derivatives and the delta method.*