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ECONOMIC RESEARCH

Working Paper 2019.01

**How to limit fiscal procyclicality: the role of
exchange rate regimes, fiscal rules and
institutions.**

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How to limit fiscal procyclicality: the role of exchange rate regimes, fiscal rules and institutions.*

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January 31, 2019

Abstract

We explore how fiscal rules, exchange rate regimes and institutional quality affect the cyclical behaviour of fiscal policy (i.e how government spending responds to GDP fluctuations). We perform our analysis on a panel of 153 advanced, emerging and developing countries over the period 1993-2015 using LGWOLS and 2SLS estimators. We find that the adoption of fiscal rules alone is not sufficient to promote counter-cyclical fiscal policy and should be combined with strong institutions. Moreover, fiscal rules seem to limit procyclicality especially in countries with flexible exchange rate regimes rather than in countries with fixed exchange rates. We also find that the disciplining effect of fiscal rules depends on the type of rule.

Keywords: Cyclicity of fiscal policy, Exchange rate regimes, Fiscal rules, Institutions, 2SLS.

JEL classification: E4, F4, O2.

*We would like to thank participants to the Annual Doctoral Meeting on Development 2017, ICEFM 2017, AFSE 2018, INFER Annual Conference 2018 and FIBA 2018 for insightful comments. Special thanks to Carine Meyimdjui, Marin Ferry, Yannick Lucotte, Tobignaré Yabré, Renté Tapsoba, Alexandru Minea and Peter Claeys for constructive remarks that helped us improve the paper. All remaining errors are ours.

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1 Introduction

The global financial crisis and the critical issue of sovereign debt solvency faced by many advanced economies, including the European Union members, have recently raised the question of how countries can pursue macroeconomic stabilization policies while maintaining the growth of public debt on a sustainable path. A mechanical solution that has been proposed in the literature is that countries pursue fiscal stimulus measures during a downturn in the economic cycle (bust) followed by fiscal contraction (and debt reduction) in a period of recovery in the economic cycle (boom). In other words, countries are encouraged to pursue a counter-cyclical fiscal policy. The convenience and usefulness of counter-cyclical policy for debt management and macroeconomic stability has been analyzed, theoretically, by Christiano et al. (2011) and Nakata (2011). They used a stochastic model with sticky prices and found that the optimal policy in such a context is counter-cyclical. However, the literature confirms that fiscal policy is not always counter-cyclical: it remains pro-cyclical¹ in many countries, particularly in developing countries (Gavin and Perotti (1997), Tornell and Lane (1999), Alesina and Tabellini (2005), Talvi and Vegh (2005), Diallo (2009), Thornton (2008), Frankel et al. (2013), Bova et al. (2014)). An interesting question that emerges in this framework is how to reduce the pro-cyclicality of fiscal policy and promote more counter-cyclical policies, synonym of fiscal discipline.

A large body of the literature addressing the cyclicity of fiscal policy relates it to exchange rate regimes and aims at finding which type of regime (rather fixed exchange rate regimes or more flexible ones) has disciplining effects on fiscal policy. In the recent period, especially in the context of the global financial crisis and of the European sovereign debt crisis (Bergman et al. (2016)), fiscal rules, instruments used to guide fiscal actions, have started to gain more and more interest. Fiscal rules are defined as "agreements designed to mitigate the deficit bias and promote fiscal discipline by constraining budgetary aggregates through numerical limits" (Schaechter et al. (2012)). In 2015, 89 countries had adopted national and supra-national rules to govern their fiscal policy (IMF Fiscal

¹Fiscal policy is considered pro-cyclical when government chooses to increase public spending and reduce taxes during an economic boom, but to reduce spending and increase taxes during an economic recession

Rules Dataset, 2015 and Budina et al. (2012)), compared to only 10 in the 1990s.

Despite this increased popularity of fiscal rules, relatively little work has been undertaken on their functioning. We try to fill this gap by examining the effectiveness of different types of fiscal rules in promoting counter-cyclical fiscal policies. Moreover we focus on the role of institutional quality and try to find whether there is a more complex solution to promote counter-cyclical fiscal policy (i.e. which deals with the underlying political source of the problem). This analysis is motivated by Frankel et al. (2013), Bergman and Hutchison (2015) and Bergman et al. (2016) which argue that good and strong institutions have beneficial effects on public finance. In addition, we revisit the effect of exchange rate regimes on the cyclicity of fiscal policy and more interestingly, we try to find whether the effect of fiscal rules depends on the exchange rate regime in place². In other words, we focus on the effect of rules conditional on the exchange rate regime in place (in line with a Mundell-Fleming approach). To the best of our knowledge, this issue has not yet been addressed in the literature.

The contribution of this paper to the literature is threefold. First, it contributes to the emerging literature on the impact of institutions and fiscal rules on the cyclicity of fiscal policy since it empirically addresses the issue of their complementarity or substitutability (Bergman and Hutchison (2015), Wyplosz (2005) and Wyplosz (2012)) in reducing pro-cyclicity and promoting fiscal discipline. Second, to the best of our knowledge, this is the first paper which examines the disciplining effect of fiscal rules, conditional on the exchange rate regimes. Third, it tackles the heterogeneity of fiscal rules since it examines the disciplining effect of different types of rules (expenditure rules, budget balance rules, debt rules and revenue rules).

We use a panel of 153 advanced, emerging and developing countries and employ a two-step econometric approach. We first compute the cyclicity coefficients of fiscal policy using the Local Gaussian-Weighted Ordinary Least Squares (LGWOLS): this allows us to obtain time-varying and country-specific coefficients. Second, we estimate how institutional quality, fiscal rules, exchange rate regimes and their interactions affect the predicted cyclicity. In addition of basic panel re-

²For example, the impact of fiscal rules in a monetary union has been tackled theoretically by Colciago et al. (2008).

gression, we use an instrumental variable method, the two-stage Least Squares (2SLS), in order to address potential endogeneity.

We show that fiscal rules alone are not enough to promote counter-cyclical fiscal policy and should be combined with better institutions. Moreover, we find that under flexible exchange rate regimes, fiscal rules are more effective in promoting counter-cyclical policies. However rules seem to become counter-productive under more fixed regimes. Pegged exchange rate regimes alone, as well as strong institutions, promote counter-cyclical fiscal policy though. We also find that the disciplinary effect of fiscal rules depends on the type of rule. Specifically, while expenditure rules and budget balance rules seem to favor fiscal pro-cyclicality, debt rules and revenue rules are associated with more budgetary discipline.

The rest of the paper is structured as follows. Section 2 provides a brief literature review on linkages of exchange rate regimes, fiscal rules and institutions to fiscal discipline. Section 3 presents our methodology and estimation strategy. Section 4 describes the data and provides a statistical outline. Section 5 presents the estimation results. Section 6 addresses endogeneity issue while section 7 discusses the robustness. Finally, section 8 concludes and deduct policy implications.

2 Literature review

Three main theoretical explanations of fiscal indiscipline emerge from the political-budget cycle models. These models establish a correlation between the electoral calendar and the macroeconomic and budgetary forecasts. The first explanation is the "inter-temporal incoherence". In fact, governments may have an interest in pursuing unexpected expansionary fiscal policy since it would generate inflation that can erode the real value of public debt (Persson and Svensson (1989)). The second explanation is "myopia" among governments and voters. In the context of election uncertainty, a government can strategically issue public debt by executing excessive deficits in order to reduce the latitude for its successor (Alesina and Tabellini (1990), Persson and Svensson (1989)). Finally, a third explanation is the "common pool problem" (Tornell and Velasco (1992)) that can

arise because of spending decisions that tend to target specific interest groups but whose total costs are socialized. In the vein of the "common pool problem", the model of Tornell and Lane (1999) explains the pro-cyclicality of fiscal policy by the "voracity effects" which are due to the actions of several politicians to appropriate resources that are common. This is even more true in times of export booms. Indeed, the authors argue that if fiscal policy is decided on a decentralized basis, with many interest groups, the classical inter-temporal smoothing behaviour disappears and gives rise to significant expenditure shares in temporary positive income shocks and thus leading to less savings to cope with future negative income shocks.

A range of the literature addressing the cyclicity of fiscal policy relates it to exchange rate regimes. This strand focuses on the disciplining effects of alternative exchange rate regimes on fiscal policy. However it does not provide a clear-cut response. While certain authors give arguments in favour of the *conventional wisdom* according to which fixed regimes have disciplining effect on fiscal policy, other support the opposite view underlining that flexible regimes are associated with more discipline. A third group of authors argue that neither fixed, nor flexible exchange rate regimes have disciplining effect on the conduct of fiscal policy (Gavin and Perotti (1997), Kaminsky et al. (2004)).

The findings of Fatás and Rose (2001) stand at odds with the conventional view, they find that belonging to a currency union did not procure fiscal discipline. Tornell and Velasco (1995) analyzed the European and Sub-Saharan countries experience and strongly reject the conventional view. Schuknecht (1999) uses a political economy model and shows that governments try to improve their re-election prospects by executing expansionary fiscal policies, but only in countries with fixed exchange rates and adequate reserve levels. For some countries, this raises doubts about the usefulness of fixed exchange rates for stabilizing the macro economy, unless reforms of the institutional framework reduce the scope for election-oriented fiscal expansion. Alberola and Molina (2004) give evidence of a weak relationship between exchange rate regimes and fiscal discipline in emerging markets. They show that fixing the exchange rate regime offsets the disciplinary effects on fiscal policy by easing the constraint on government budget. Duttagupta and Guillermo (2006)

found that currency union as fixed regime encourages, unlike flexible regimes, over-spending and free-riding behaviours.

The conventional view stipulates that exchange rate-based stabilization induces more discipline than do other anchors. A number of authors give arguments in favour of that *conventional wisdom* according to which more fixed exchange rate regimes have disciplining effect on fiscal policy. For example, Canavan and Tommasi (1997) use a theoretical Barro-Gordon model with incomplete information and imperfect monitoring and document that serious stabilizers prefer more visible anchors like the nominal exchange rate. Moreover, Beetsma and Bovenberg (1998) support that monetary unification reduces inflation, taxes and public spending. These disciplining effects of monetary union, which become stronger when the union widens, are likely to raise welfare. Furthermore, Canzoneri et al. (2001) gave another theoretical evidence of the conventional view by distinguishing between Ricardian and Non-ricardian framework. They found that under a Ricardian framework, fixed regimes are disciplining in the sense that government respects its inter-temporal fiscal constraint. Empirical studies performed in the same vein document this conventional claim. Ghosh et al. (2010) explain that fixed regime is disciplining for fiscal policy. They argue that pegged regimes put constraints on the conduct of macroeconomic policy. Under such regimes, the domestic monetary policy follows the anchor country's monetary policy. They further qualify the pegged regimes as a double-edged sword tool: they are useful for countries lacking institutional credibility and discipline, but, in the same way, they constrain the use of stabilization tool such as the interest rate to offset the macroeconomic shocks that countries could face. Furthermore, Sow (2015) examined the impact of exchange rate regimes on the cyclical properties of fiscal policy for a sample of 118 developing countries over the period 1993-2007. The author found that the magnitude of pro-cyclicality is reduced for countries under pegged regimes compared to those under flexible ones.

During the recent decades, many solutions, including fiscal rules have been proposed in the literature to reduce pro-cyclicality of fiscal policy and more generally to promote fiscal discipline. Debrun et al. (2008), for example, identifies four main categories of solutions: "(1) policy makers can be

held more accountable for their actions (Corbacho and Schwartz (2007)); (2) improve procedures for the preparation, approval and implementation of annual budget laws (Von Hagen and Harden (1995)); (3) delegate policy or aspects of fiscal policy to institutions that are isolated from short-term political pressures (Wyplosz (2005)); and (4) limiting the discretion of budgetary authorities through ex ante fiscal rules that provide numerical targets or ceilings for budgetary aggregates or criteria for the conduct of fiscal policy (Krogstrup and Wyplosz (2010)).” Moreover, Tapsoba (2012) use impact evaluation methods to assess the treatment effect of fiscal rules on budgetary discipline in 74 developing countries over the period 1990-2007 and suggest that fiscal rules are a credible remedy against budgetary indiscipline in developing countries. More recently, Guerguil et al. (2017) assess the impact of different types of flexible fiscal rules on the pro-cyclicality of fiscal policy using propensity scores-matching techniques. The authors find that not all fiscal rules have the same impact: the design matters. Specifically, they find that investment-friendly rules reduce the pro-cyclicality of both overall and investment spending. The effect appears stronger in bad times and when the rule is enacted at the national level.

In addition to fiscal rules, recent papers have shed light on the role of institutional quality in promoting fiscal discipline: good institutions have been proposed as a remedy against fiscal policy pro-cyclicality (Frankel et al. (2013); Bergman and Hutchison (2015)). For example, Muscatelli et al. (2012) explain that transparency in the decision-making process helps achieve fiscal solvency. Calderón et al. (2012) examines the role of the level of institutional quality on governments ability to deliver counter-cyclical macroeconomic policies. Using a global sample of 115 industrial and developing countries over the time span 1984-2008, they find that institutional quality plays a key role in countries’ capacity to implement counter-cyclical macroeconomic policies. Their results show that countries with strong (weak) institutions adopt counter- (pro) cyclical macroeconomic policies. Frankel et al. (2013) shows that good institutions fundamentally explain the reduction of policy pro-cyclicality. They find that countries graduate from pro-cyclicality as institutions improve. Moreover, Foremny (2014) shows that the effectiveness of fiscal rules and tax autonomy depends on the constitutional structure of government. The author further explains that fiscal aggregates vary greatly from country to country, even for countries with similar economic conditions,

and differences in deficits can be attributed to differences between countries in terms of political and institutional factors. Iara and Wolff (2014) show that the legal base of fiscal rules and their enforcement mechanisms are the most important dimensions of rule-based fiscal governance. Furthermore, Bergman and Hutchison (2015) underline, in a dynamic panel model with 81 developed, emerging and developing countries, that fiscal rules alone are not enough to reduce pro-cyclicality and should be combined with better institutions in order to become more effective.

Our paper attempts to test 3 hypotheses concerning fiscal rules, institutional quality, exchange rate regimes and the cyclicality of fiscal policy.

H1: Better institutional quality promote counter-cyclical fiscal policy, thus having a beneficial effect on fiscal discipline.

H2: Fiscal rules contribute to promote counter-cyclical fiscal policy and are more effective when implemented in an environment with strong institutions. Rules and good institutions are complementary.

H3: The effect of fiscal rules on the cyclicality of fiscal policy differs across alternative types of exchange rate regimes.

3 Methodology

As aforementioned, our research question is the following: to what extent fiscal rules, institutions and exchange rate regimes affect the cyclical behaviour of fiscal policy? We implement a two-step approach using a specification which first deals with the cyclicality of fiscal policy, captured in a time-varying dimension at country level. Second, it examines the effects of rules, institutions and exchange rate regimes and their interactive effects on cyclicality.

In the first step, we follow Aghion et al. (2007) and Guerguil et al. (2017) by computing cyclicality coefficients of fiscal policy using a non parametric regression method: the Local Gaussian-Weighted

Ordinary Least Squares (LGWOLS). This approach allows computing cyclicity coefficients that are country-specific and time-varying. Indeed, it allows capturing the fact that government reaction to business cycle fluctuations may vary over time and differ between the up and down phases of the business cycle.

The estimation of equation (1) uses LGWOLS and allows computing the cyclicity coefficients.

$$\Delta \text{Log}(GEXP_{it}) = \alpha_{it} + \beta_{it} \Delta \text{Log}(GDP_{it}) + \varepsilon_{it} \quad (1)$$

$$\text{With } \varepsilon_{it} \rightarrow N(0, \frac{\sigma^2}{\omega_t(\tau)}) \text{ and } \omega_t(\tau) = \frac{1}{\sigma\sqrt{2\pi}} \exp(-\frac{(\tau-t)^2}{2\sigma^2})$$

To compute coefficients $\hat{\beta}_{it}$, the LGWOLS weights all observations by a Gaussian centered at t , for country i and then performs one regression for each date t . In fact, The method uses all the observations for each year and the closest observations to the year considered are given a greater weight. Concerning the choice of σ , we follow Aghion et al. (2007) and Guerguil et al. (2017) and use a value of the parameter σ equal to 5.

$\Delta \text{Log}(GEXP_{it})$ is the growth rate of government real expenditure for country i at time t and $\Delta \text{Log}(GDP_{it})$ refers to the growth rate of government real GDP for country i at time t . The predicted country-specific and time-varying coefficient $\hat{\beta}_{it}$ captures the cyclical behaviour of public spending. It measures the cyclicity of public spending for country i at time t . Hence, fiscal policy is considered pro-cyclical (resp. counter-cyclical) if $\hat{\beta}_{it} > 0$ (resp. < 0) and acyclical otherwise.

In the second step, we use the predicted coefficients $\hat{\beta}_{it}$ (the cyclicity of fiscal policy) as dependent variable and search for the effects of our interest variables, in relation to the three hypotheses (H1, H2, H3) mentioned in the previous section. Equation (2) puts forward the independent effects of fiscal rules, institutions and exchange rate regimes on cyclicity. It is meant to test H1. Equation (3) allows us capturing the interaction effect of fiscal rules and institutions on cyclicity. Hence, it can capture the insights of H2. Equation (4) in turn allows measuring the effect of fiscal rules conditional on the exchange rate regime in place: it tackles thus H3.

$$\hat{\beta}_{it} = \alpha_{it} + \lambda FRD_{it} + \delta BQ_{it} + \theta ERR_{it} + \sum \phi_k X_{kit} + \eta_i + \varepsilon_{it} \quad (2)$$

$$\hat{\beta}_{it} = \alpha_{it} + \lambda FRD_{it} + \delta BQ_{it} + \theta ERR_{it} + \varphi FRD_{it} \times BQ_{it} + \sum \phi_k X_{kit} + \eta_i + \varepsilon_{it} \quad (3)$$

$$\hat{\beta}_{it} = \alpha_{it} + \lambda FRD_{it} + \delta BQ_{it} + \theta ERR_{it} + \rho FRD_{it} \times ERR_{it} + \sum \phi_k X_{kit} + \eta_i + \varepsilon_{it} \quad (4)$$

Overall, equation (1), (2) and (3) allow testing respectively the three hypothesis (H1, H2 and H3) mentioned in the literature section. FRD_{it} is the fiscal rules dummy for country i at time t and BQ_{it} is our institutional variable, the bureaucracy quality index for country i at time t . ERR_{it} is the variable of exchange rate regimes classification. In our analysis, we first run the equations (2) (3) and (4) for the presence of fiscal rules in general. Then we consider the presence of different types of fiscal rules since numerical rules could have different budgetary outcomes according to the type of budgetary aggregate which is concerned. We differentiate between expenditure rules (ER), debt rules (DR), budget balance rules (BBR) and revenue rules (RR). The coefficient λ stands for the direct effect of fiscal rules on expenditure cyclicality. δ measures the effect of institutions on cyclicality and the coefficient θ measures the effect of exchange rate regimes on cyclicality. The coefficient φ captures the interactive effect of fiscal rules and institutions. In turn, ρ allows measuring the effect of fiscal rules conditioned to the exchange rate regime in place. α_{it} the constant term is the cyclicality of expenditures which is independent from any of the explanatory variables. η_i stands for the country fixed effects and ε_{it} is the idiosyncratic error. We also add a vector of covariates X in order to control for other variables that could affect the conduct of fiscal policy according to the literature. The set of control variables includes an inflation targeting dummy, the number of years prior to elections, an index for government polarization, the output volatility, the logarithm of GDP per capita, the ratio of public debt to GDP and the ratio of natural resource rents to GDP.

We perform the estimation of our second-step equations, (namely eq(2), (3) and (4)) using first, basic panel regression (estimation results in section 5). And then in section 6, we perform the regressions using an instrumental variable technique (2SLS) to address endogeneity concern.

4 Data and Statistical Outline

Our investigation covers a total of 153 countries over a 23-years period: 1993-2015.

To measure the cyclicity of fiscal policy, we compute, as aforementioned, the impact of real GDP growth on real expenditure growth using the LGWOLS. Our preference for public expenditure as fiscal policy variable rather than others like primary balance or revenue is motivated by the criticism of Kaminsky et al. (2004). The authors argue that fiscal balance or revenue are results of fiscal policy rather than instruments. In fact, if a government wants to influence economic activity, it would modify its expenditure program or change tax rates and such effects would affect revenue and fiscal balance. Moreover, the advantage of using government expenditures is that co-movements with GDP are able to clearly differentiate between pro-cyclical, a-cyclical and counter-cyclical fiscal policy (Bergman and Hutchison (2015)).

The source of the data on fiscal rules is "IMF Fiscal Rules Dataset 2016" from the Fiscal Affairs Department of the International Monetary Fund. This dataset contains information on all the types of fiscal rules (expenditure rules, debt rules, budget balance rules, revenue rules) and their characteristics for the countries in which they did exist at any time since 1985. We perform our regressions using dummy variables of different types of fiscal rules. FRD stands for fiscal rules dummy, ERD for expenditure rules dummy, DRD is debt rules dummy, BBRD is budget balance rules dummy and RRD is revenue rules dummy.

Our institutional quality variable is "Bureaucracy quality" from International Country Risk Guide (ICRG). Bureaucracy quality represents "the institutional strength and quality of the bureaucracy; a shock absorber that tends to minimize revisions of policy when governments change" (ICRG 2015). It ranges between 0 and 4, with "high points indicating countries where the bureaucracy has the strength and expertise to govern without drastic changes in policy or interruptions in government services. In these low-risk countries, the bureaucracy tends to be somewhat autonomous from political pressure and to have an established mechanism for recruitment and training" (ICRG).

We use as exchange rate regimes variable, the classification by Ilzetki et al. (2017). The classification ranges from 1 to 15, with lower values representing more fixed exchange rate regimes and higher values representing more flexible regimes (See Appendix 4).

As aforementioned, the set of control variables that we employ includes an inflation targeting dummy, the number of years prior to elections, an index for government polarization, the output volatility, the logarithm of GDP per capita, the ratio of public debt to GDP and the ratio of natural resource rents to GDP.

The use of inflation targeting is motivated by the fact that this institutional reform may influence the conduct of fiscal policy by limiting the scope of seigniorage revenues and placing other constraints on expenditure (Combes et al. (2017)). To address this point, we use a dummy variable equal to 1 if the country has implemented inflation targeting at time t and 0 otherwise. The data is taken from Aizenman et al. (2011), Samarina and De Haan (2014), and Laurens et al. (2015).

In addition, we take account of the electoral cycles to explain fiscal discipline since the main theoretical explanations of fiscal indiscipline emerge from the political budget cycle models. We use the variable *elections* which is the number of years prior to executive elections. We construct this variable using the database of Hyde and Marinov (2012): The National Elections across Democracy and Autocracy (NELDA) dataset.

The literature on government fragmentation suggests that fragmentation has harmful effect on public finances (Kontopoulos and Perotti (1999); Volkerink and De Haan (2001)). Thus, government polarization may be associated with higher fiscal discipline. We use the index *Polariz* from the World Bank Database of Political Institutions to control for government polarization. It represents the maximum polarization between the executive party and the four principle parties of the legislature. The higher the index, the more polarized the government is. The index is zero if the chief executive's party has an absolute majority in the legislature.

Moreover, we follow Frankel et al. (2013) and Talvi and Vegh (2005) by controlling for the variability of tax revenues (proxied by output variability). This channel has been emphasized by Talvi and

Vegh (2005) who argue that, in the presence of political distortions, the larger the variability of tax revenues, the more pro-cyclical fiscal policy will be. We use the square of the cyclical component of real GDP from Hp filter (parameter 6.5) to measure output variability.

We also control for the characteristics inherent to the level of development of countries using the logarithm of GDP per capita. This allows to know whether the behaviour of fiscal policy depends on the level of development.

We control for the level of public debt. Controlling for this variable seems somewhat compulsory since public debt is an important element of decision when designing public expenditure programs.

Finally, the literature on Dutch disease suggests that the abundance of natural resources in a particular country and the mismanagement of resource rents could have detrimental effects on public finances (Torvik (2009)). Hence, we use the ratio of natural resource rents to GDP as a control variable. Appendix 1 recapitulate the variables used and the source of data.

Appendix 2 displays basic descriptive statistics on the whole set of variables employed in the model. We also add at the bottom of the table, descriptive statistics on literacy rate of adults (LRA) and life expectancy at birth (LEB), (obtained from World Bank WDI), that we use, in the section 6, as instruments for institutional quality, in addition to the lagged variables of institutional quality.

The correlation matrix in Appendix 3 reports the degree of correlation between the different variables. It suggests that multicollinearity is not likely to be an issue and hence authorizes the introduction of the different variables in the empirical model.

Since our variable of cyclicity of fiscal policy is generated using LGWOLS, we display in figure 1 the Kernel density plot to view the distribution of the variable. On the right, the figure presents the same plot for the distribution of bootstrapped estimates of the cyclicity (with 200 replications). The distribution of the generated cyclicity coefficients is roughly normal.

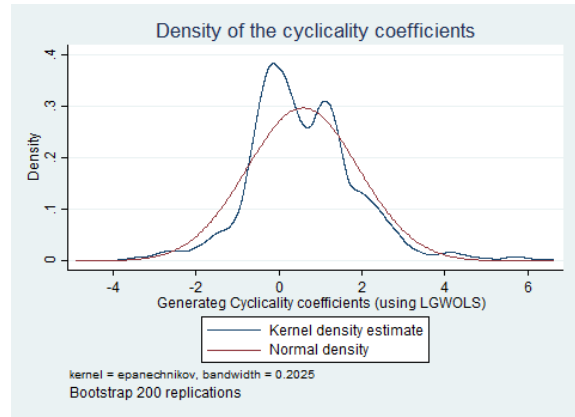
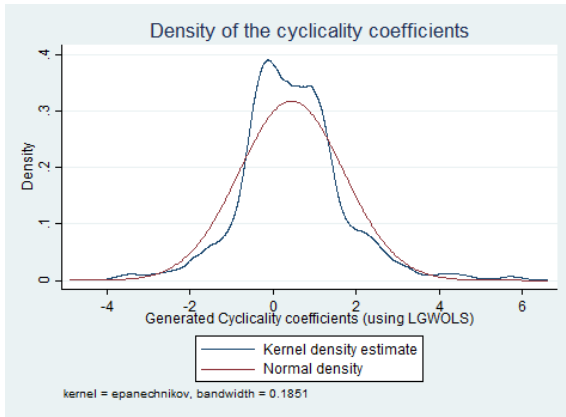


Figure 1: Density plot of cyclical coefficients

5 Empirical results

Table 1 reports the estimation results using basic panel regression for equations 2, 3 and 4. We use as fiscal rules variable the dummy variable reflecting the existence of any type of fiscal rules. We search for the effect of exchange rate regimes, the adoption of fiscal rules, and the institutional quality on the conduct of fiscal policy. In column 9, we add all the control variables and the interactive variable of fiscal rules and institutional quality. In column 10, we add the interactive effect of fiscal rules and exchange rate regimes in order to examine the effect of fiscal rules conditioning it on the type of exchange rate regime in place.

We do not find a significant beneficial effect of the adoption of fiscal rules on the cyclical behaviour of fiscal policy. However, in line with Frankel et al. (2013) and Bergman and Hutchison (2015), institutional quality have beneficial effects on the conduct of fiscal policy. The better the institutional quality, the more counter-cyclical (or less pro-cyclical) fiscal policy is. The coefficient of the interactive term between fiscal rules and institutional quality is negative and statistically significant. This suggests that when institutions are strong, fiscal rules are effective in promoting counter-cyclical fiscal policy. Good institutions combined with fiscal rules have disciplining effect on fiscal policy. The more institutions improve, the more effective are fiscal rules in promoting counter-cyclical policies, and thus fiscal discipline. Numerical fiscal rules and good institutions form a potent combination which have beneficial effect on fiscal discipline. This finding is line with Bergman and Hutchison (2015) and Wyplosz (2012) which stipulate that to be effective, rules must be embedded in institutional arrangements.

Moreover, we find that the more fixed (resp. flexible) exchange rate regime is, the more counter-cyclical (resp. pro-cyclical) fiscal policy is. Hence, more pegged exchange rate regimes promote counter-cyclical fiscal policy, having thus disciplining fiscal effect. This finding is in line with the *conventional wisdom* (Canavan and Tommasi (1997) Ghosh et al. (2010) and Sow (2015)).

When it comes to analyzing the interaction effect of fiscal rules with the exchange rate regime, we find a negative coefficient, stipulating that under more flexible exchange rate regimes, fiscal rules

have significant beneficial effect on the conduct of fiscal policy. The more flexible an exchange rate regime is, the more effective fiscal rules are in promoting counter-cyclical policies. However under fixed regimes, rules seem to become counter-productive . This can be explained by the fact that pegged exchange rate regimes constrain the use of monetary policy tools and let governments have hands only on the fiscal policy tools, namely on public spending. Hence, by constraining fiscal policy, the adoption of fiscal rules results in the doubling of the restrictions affecting governments and this could not yield disciplined behaviour. It would instead yield more discretionary and corrupted behaviour since governments are doubly constrained (at the monetary policy level and at the fiscal policy level).

Our empirical results also show that inflation targeting is beneficial for fiscal discipline. In fact, this institutional reform may influence the conduct of fiscal policy by limiting the scope of seigniorage revenues and placing other constraints on expenditure. Moreover, we find that government polarization has beneficial effect on fiscal discipline. When fiscal policy is decided on a centralized basis, the voracity effects due to the conflicts of interest of many groups could disappear and instead yield inter-temporal smoothing behaviours which are better for macroeconomic stability. The findings also suggest that the electoral cycle significantly affect the conduct of fiscal policy. The higher the number of years prior to executive elections is, the more pro-cyclical fiscal policy is. When elections are far, fiscal policy is less disciplined and when countries are closed to executive elections, government tend to groom electors by performing more disciplined policies in order to guarantee their reelection. GDP per capita is negatively associated with cyclicity coefficients. This means that more developed countries tend to perform counter-cyclical fiscal policies. Furthermore, we find that the volatility of output yields pro-cyclical policy as emphasized by Talvi and Vegh (2005).

Dependent variable: Cyclicity of fiscal policy β_{it}										
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
FRD	-0.058*** (0.032)	-0.016*** (0.033)	0.060 (0.250)	0.144 (0.244)	0.197 (0.241)	0.197 (0.239)	0.180 (0.239)	0.069 (0.249)	0.300 (0.593)	0.083 (0.490)
BQ	-0.194*** (0.033)	-0.183*** (0.033)	-0.091*** (0.050)	-0.111*** (0.059)	-0.032*** (0.061)	-0.034*** (0.060)	-0.132*** (0.063)	-0.021*** (0.073)	0.020*** (0.070)	-0.020*** (0.071)
ERR	0.005*** (0.004)	0.004*** (0.004)	0.009*** (0.050)	0.012*** (0.012)	0.007*** (0.011)	0.007*** (0.011)	0.006*** (0.011)	0.008*** (0.010)	0.008*** (0.010)	0.009*** (0.014)
FRD X BQ									-0.107*** (0.070)	
FRD X ERR										-0.002*** (0.015)
IT		-0.253*** (0.051)	-0.441*** (0.086)	-0.618*** (0.106)	-0.586*** (0.107)	-0.585*** (0.106)	-0.528*** (0.129)	-0.447*** (0.053)	-0.456*** (0.052)	-0.447*** (0.055)
ELECTIONS			0.003*** (0.003)	0.002*** (0.003)	0.001*** (0.003)	0.001*** (0.003)	0.000*** (0.003)	0.004*** (0.003)	0.004*** (0.003)	0.004*** (0.003)
POLARIZ				-0.149*** (0.014)	-0.148*** (0.015)	-0.147*** (0.015)	-0.177*** (0.016)	-0.099*** (0.010)	-0.101*** (0.010)	-0.099*** (0.010)
GDPPC					-0.274*** (0.025)	-0.276*** (0.024)	-0.236*** (0.022)	-0.193*** (0.024)	-0.172*** (0.030)	-0.191*** (0.024)
OV						5.606** (3.763)	15.211*** (3.414)	19.987 (6.854)	20.875 (7.231)	19.953 (7.183)
RENT							-0.023*** (0.003)	-0.029** (0.003)	-0.028*** (0.003)	-0.029*** (0.003)
DEBT								0.001 (0.001)	0.001 (0.001)	0.001 (0.001)
Obs	2264	2264	1288	1021	1004	1004	985	912	912	912
Countries	120.000	120.000	72.000	71.000	70.000	70.000	69.000	68.000	68.000	68.000
Hansen J	0.696	0.698	0.662	0.711	0.703	0.674	0.690	0.732	0.735	0.736

Bootstrapped standard errors in parenthesis (100 replications)
* p<0.10, ** p<0.05, *** p<0.01

Table 1: Empirical results: basic panel regression

In figure 2, we plot the country specific average cyclicity coefficients against the country specific average values of the interactive term of fiscal rules and institutions³. The illustrative figure confirms that rules and good institutions together have beneficial effects on fiscal discipline since they promote counter-cyclical macroeconomic policies.

³Figure 2 is a binned scatterplot. We compute it using the stata command *binscatter*. Binned scatterplots provide a non-parametric way of visualizing the relationship between two variables. With a large number of observations, a scatterplot that plots every data point would become too crowded to interpret visually. The Stata command *binscatter* groups the x-axis variable into equal-sized bins, computes the mean of the x-axis and y-axis variables within each bin, then creates a scatterplot of these data points. The result is a non-parametric visualization of the conditional expectation function. It is optimized for speed in large datasets

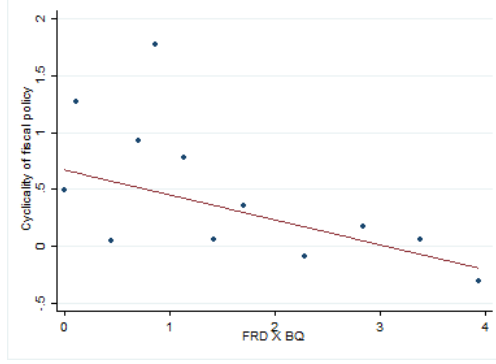


Figure 2: Cross-correlation of fiscal policy cyclicality with the interactive term of FRD and BQ

In order to refine our investigation, we specifically examine how different types of rules influence the cyclicality of fiscal policy. We differentiate between expenditure rules (ER), budget balance rules (BBR), debt rules (DR) and revenue rules (RR). Table 2 reports the estimation results for expenditure rules, budget balance rules and debt rules. Specifically, we find that while expenditure rules and budget balance rules seem to be associated with fiscal pro-cyclicality, debt rules and revenue rules seem to favor more budgetary discipline.

Dependent variable: Cyclicality of fiscal policy β_{it}				
	(1)	(2)	(3)	(4)
BQ	-0.028*** (0.087)	-0.029*** (0.071)	-0.058*** (0.062)	-0.041*** (0.088)
ERR	0.008*** (0.011)	0.008*** (0.010)	0.007*** (0.011)	0.008*** (0.010)
ERD	0.235** (0.066)			
BBRD		0.021*** (0.081)		
DRD			-0.155*** (0.102)	
RRD				-0.130** (0.117)
IT	-0.427*** (0.054)	-0.437*** (0.054)	-0.420*** (0.055)	-0.435*** (0.053)
ELECTIONS	0.003*** (0.003)	0.004*** (0.003)	0.004*** (0.003)	0.005*** (0.003)
POLARIZ	-0.096*** (0.010)	-0.099*** (0.009)	-0.097*** (0.010)	-0.100*** (0.010)
GDPPC	-0.204*** (0.033)	-0.183*** (0.023)	-0.147*** (0.032)	-0.174*** (0.032)
OV	19.208 (6.865)	19.636 (6.915)	17.990 (5.841)	18.513 (6.149)
RENT	-0.029*** (0.003)	-0.029*** (0.003)	-0.029*** (0.003)	-0.029*** (0.003)
DEBT	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)
Obs	912	912	912	912
Countries	68.000	68.000	68.000	68.000
Hansen J	0.736	0.728	0.733	0.735

Bootstrapped standard errors in parenthesis (100 replications)
 * p<0.10, ** p<0.05, *** p<0.01

Table 2: Results for ER, BBR, DR, RR

6 Addressing Endogeneity

In this section, we perform the estimations of our second-step equations, (namely eq(2), (3) and (4)) using an instrumental variable technique: the Two-Stage Least Squares (2SLS) estimator in order to address potential endogeneity problem. Table 3 provides the estimation results that count for endogeneity. In fact, one could argue that counter-cyclical (pro-cyclical) fiscal policies that tend to stabilize (destabilize) the economy might improve (worsen) institutional quality (Frankel et al. (2013)). "For example, procyclical fiscal policies could increase the chances of governments running into debt sustainability problems during busts. These critical financing needs could then lead to expropriation, repudiation of contracts, and/or intervention in independent branches of governments such as the judiciary system or the central bank. Moreover, the turmoil typically associated with debt crises can exacerbate corruption in the political system thus weakening the foundations of an efficient and professional public administration." ⁴ That is to say, the causality may run from cyclicalities of fiscal policies to institutional quality and the reverse way around. To address such endogeneity concern, we instrument institutional quality. The literature on institutions has not yet found time-varying instrumental variables for the quality of institutions and rely on cross-country regressions and instrument institutions using European settlers' mortality and latitude (absolute value): Acemoglu et al. (2001), Frankel et al. (2013). Since we are in panel, we use as instruments, the life expectancy at birth, the literacy rate of adults and the lagged levels of institutional quality. Life expectancy at birth and literacy rate undoubtedly reflects the same information as the ones used by Acemoglu et al. (2001), but have a time varying dimension.

⁴Frankel et al. (2013)

Dependent variable: Cyclicity of fiscal policy β_{it}										
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
FRD	0.294 (0.288)	0.326 (0.017)	0.385 (0.025)	0.386 (0.057)	0.555 (0.388)	0.555 (0.394)	0.750 (0.418)	0.733 (0.423)	2.010 (1.570)	2.092 (0.940)
BQ	-0.602*** (0.310)	-0.589*** (0.034)	-0.578** (0.065)	-0.621* (0.208)	-0.579** (0.075)	-0.578** (0.075)	-0.503 (0.117)	-0.521 * (0.090)	-0.079 * (0.094)	-1.002* (0.090)
ERR	0.040*** (0.039)	0.043*** (0.002)	0.047** (0.006)	0.069* (0.022)	0.075** (0.008)	0.075** (0.008)	0.103** (0.008)	0.101 * (0.009)	0.118 * (0.009)	0.252 * (0.010)
FRD X BQ									-0.549 ** (0.038)	
FRD X ERR										-0.241*** (0.007)
IT		-0.269 (0.019)	-0.398*** (0.032)	-0.474*** (0.106)	-0.336*** (0.046)	-0.336*** (0.046)	-0.369*** (0.025)	-0.379*** (0.026)	-0.475*** (0.026)	-0.532 *** (0.026)
ELECTIONS			0.033*** (0.002)	0.030 (0.004)	0.026*** (0.003)	0.026*** (0.002)	0.026*** (0.003)	0.027 *** (0.002)	0.023 *** (0.002)	0.031 *** (0.002)
POLARIZ				-0.409*** (0.018)	-0.437*** (0.011)	-0.436*** (0.011)	-0.350*** (0.009)	-0.333*** (0.007)	-0.299*** (0.007)	-0.351*** (0.007)
GDPPC					-0.892*** (0.057)	-0.890*** (0.057)	-0.808*** (0.055)	-0.729 *** (0.058)	-0.790 *** (0.058)	-0.847*** (0.059)
OV						1.585** (3.700)	1.833* (5.331)	13.458 ** (4.481)	10.062 ** (4.481)	-2.864 ** (4.569)
DEBT							-0.001 (0.001)	-0.002 (0.000)	-0.001 (0.000)	-0.002 (0.000)
RENT								-0.012 *** (0.002)	-0.008 *** (0.002)	-0.015*** (0.002)
Obs.	2,177	2,177	1,242	978	962	970	901	883	883	883
Countries	120	120	72	71	70	70	61	68	68	68
Hansen J	0.275	0.300	0.240	0.132	0.163	0.163	0.139	0.167	0.153	0.265

Bootstrapped standard errors in parenthesis (100 replications)
* p<0.10, ** p<0.05, *** p<0.01

Table 3: Estimation results: addressing endogeneity

7 Robustness Check

In this section, we provide a robustness check for our empirical findings. In order to check the consistency of our empirical results, we use an alternative variable of institutional quality from a source other than ICRG. We employ the *government effectiveness* index from the Worldwide Governance Indicators, 2015 Update database of the World Bank.⁵ The Government effectiveness reflects “perceptions of the quality of public service, the quality of civil service and the degree of independence of political pressures, the quality of policy formulation and implementation, and the credibility of the government’s commitment to these services.” It was initially comprised between -2.5 and 2.5 with high values indicating more efficient governments. However we normalize it between 0 and 5.

Table 4 displays the estimation results when we perform the same regressions as in the previous

⁵The whole dataset comprises data on the quality of governance provided by “a large number of enterprise, citizen and expert survey respondents in industrial and developing countries. These data are gathered from a number of survey institutes, think tanks, non-governmental organizations, international organisations, and private sector firms”

section while substituting bureaucracy quality by *government effectiveness*. The use of that other variable of institutional quality do not fundamentally change our findings. Specifically, we find that fiscal rules may help promote counter-cyclical fiscal policy but are more effective when implemented in an environment with good institutions. Fiscal rules, together with strong institutions form a potent combination which promote counter-cyclical policy.

Moreover we get the same results with the control variables. Inflation targeting and government polarization are associated with more fiscal discipline. Less developed countries tend to perform pro-cyclical policies; and in the hedge of elections, governments tend to perform budgetary discipline.

Dependent variable: Cyclicality of fiscal policy $\beta_{i,t}$										
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	10
FRD	-0.022 *** (0.007)	-0.002*** (0.008)	-0.001*** (0.013)	0.174 (0.011)	0.186 (0.010)	0.188 (0.010)	0.196 (0.010)	0.186 (0.096)	0.730 (0.546)	0.131 (0.086)
GE	-0.039 *** (0.028)	-0.013*** (0.029)	0.246*** (0.070)	-0.232** (0.095)	-0.148*** (0.094)	-0.147** (0.097)	-0.176*** (0.099)	-0.122 *** (0.132)	-0.049 * (0.200)	-0.135 *** (0.132)
ERR	0.020** (0.004)	0.022*** (0.004)	0.036* (0.008)	0.022* (0.013)	0.023* (0.013)	0.023* (0.013)	0.022* (0.013)	0.017 *** (0.011)	0.019 *** (0.012)	0.014*** (0.011)
FRD X GE									-0.205* (0.130)	
FRD X ERR										0.010 (0.013)
IT		-0.238** (0.042)	-0.244* (0.068)	-0.387** (0.042)	-0.342*** (0.041)	-0.341*** (0.041)	-0.345*** (0.042)	-0.360*** (0.060)	-0.346*** (0.062)	-0.352*** (0.061)
ELECTIONS			0.011*** (0.002)	0.002*** (0.002)	0.003*** (0.002)	0.003*** (0.002)	0.002*** (0.002)	0.003 *** (0.001)	0.002 *** (0.001)	0.003 *** (0.001)
POLARIZ				-0.019** (0.017)	-0.029*** (0.016)	-0.031*** (0.016)	(0.002)	-0.012*** (0.017)	-0.009 *** (0.014)	-0.010 *** (0.017)
GDPPC					-0.303*** (0.051)	-0.308*** (0.054)	-0.306*** (0.061)	-0.268*** (0.090)	-0.273*** (0.106)	-0.267*** (0.088)
OV						-5.772* (2.675)	-6.542* (2.655)	-4.509 (3.574)	-6.162 (3.338)	-4.145 (5.424)
DEBT							-0.001*** (0.000)	-0.001*** (0.001)	-0.001 (0.001)	-0.001 *** (0.001)
RENT								-0.020 (0.008)	-0.018** (0.008)	-0.020*** (0.007)
Obs.	1,316	1,316	724	493	487	487	486	479	479	479
Countries	137	137	78	70	69	69	69	68	68	68
Hansen J	0.269	0.288	0.204	0.816	0.962	0.966	0.982	0.964	0.949	0.963

Bootstrapped standard errors in parenthesis (100 replications)

* p<0.10, ** p<0.05, *** p<0.01

Table 4: Robustness check

8 Conclusion and Policy Implications

We explore how numerical fiscal rules, exchange rate regimes and institutional quality affect the cyclical behaviour of fiscal policy (i.e how government spending responds to GDP fluctuations). We perform our analysis using a panel of 153 advanced, emerging and developing countries over a 23-year period, from 1993 to 2015. We proceed by a two-step econometric approach. We first compute the cyclical coefficients of fiscal policy using the Local Gaussian-Weighted Ordinary Least Squares (LGWOLS) and secondly estimate how institutional quality, fiscal rules and exchange rate regimes affect the predicted cyclical. In addition to basic panel regression, we use an instrumental variable method, the two-stage Least Squares (2SLS), in order to address endogeneity issue.

We find that fiscal rules alone are not enough to promote counter-cyclical fiscal policy and should be combined with better institutions. Fiscal rules, together with strong institutions form a more optimal combination which have disciplining effect on fiscal policy. This finding is in line with Bergman and Hutchison (2015) and Wyplosz (2012) which stipulate that to be effective, rules must be embedded in institutional arrangements. Our result is robust to the use of alternative variable of institutional quality.

Moreover, we show that the more pegged the exchange rate regime is (resp. flexible), the more counter-cyclical (resp. pro-cyclical) fiscal policy is. Hence, more fixed exchange rate regimes promote counter-cyclical fiscal policy, having thus disciplining effects on fiscal policy. Furthermore, we find that under more flexible exchange rate regimes, fiscal rules are effective in promoting counter-cyclical policies. But under more fixed ones, fiscal rules seem to be associated with less fiscal discipline.

We also find that the disciplining effect of fiscal rules depends on the type of rule. Specifically, while expenditure rules and budget balance rules seem to be associated with fiscal pro-cyclicality, debt rules and revenue rules seem to favor more budgetary discipline.

To sum up, fiscal rules are not a sufficient remedy against fiscal indiscipline and should be com-

bined with better institutions. Governments should be encouraged to improve their governance and institutional framework, which is a pledge of budgetary discipline, necessary to accomplish macroeconomic stabilization. In addition, the prescription or recommendation of fiscal rules seem to be more convenient for countries facing flexibility of their exchange rate regimes than for countries that have pegged exchange rate regimes.

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9 Appendix

Variable	Description	Source
GEXP	Government real expenditure	IMF WEO April 2017
GDP	Government real GDP	IMF WEO April 2017
$\hat{\beta}_{it}$	Cyclicalities of real expenditure	Estimation of equation (1)
FRD	Fiscal rules dummy (0;1)	IMF Fiscal rules dataset 2017
ERD	Expenditure rules dummy (0;1)	IMF Fiscal rules dataset 2017
BBRD	Budget balance rules dummy (0;1)	IMF Fiscal rules dataset 2017
DRD	Debt rules dummy (0;1)	IMF Fiscal rules dataset 2017
RRD	Revenue rules dummy (0;1)	IMF Fiscal rules dataset 2017
BQ	Bureaucracy quality [0;4]	ICRG Dataset 2015
ERR	Exchange rate regimes [0;15]	Ilzetzki et al. (2017) and cf. Appendix 4
IT	Inflation targeting Dummy	Aizenman et al. (2011), Samarina and De Haan (2014), Laurens et al. (2015) cf. Appendix 5
ELECTIONS	Years prior to elections	Hyde and Marinov (2012); our calculations
POLARIZ	Polarization index [0;2]	World Bank Database of political institutions 2015
OV	Output variability	IMF WEO April 2017; our calculations
GDPPC	Logarithm of GDP per capita	World Bank WDI
DEBT	Ratio of public debt to GDP	IMF WEO April 2017
RENT	Ratio of natural resource rent to GDP	World Bank WDI

Table 5: Appendix 1 Description of variables and source

Variable	Obs	Mean	Std Dev.	Min	Max
$\hat{\beta}_{it}$	3073	0.451	1.257	-4.685	6.454
FRD	3519	0.370	0.483	0	1
BQ	2575	2.267	1.131	0	4
ERR	3519	6.205	4.378	0	15
IT	3519	0.144	0.351	0	1
ELECTIONS	1953	2.412	2.243	0	17
POLARIZ	2470	0.426	0.775	0	2
OV	3476	0.000	0.006	0	0.351
GDPPC	3339	8.431	1.521	4.749	11.61
DEBT	3009	56.95	48.94	0	789.8
RENT	3556	7.580	11.95	0	89.16
LRA	449	80.72	21.22	10.89	99.97
LEB	3449	68.67	9.478	43.17	83.84

Table 6: Appendix 2 Descriptive statistics

	$\hat{\beta}_{it}$	frd	bq	err	it	elections	polariz	ov	gdppc	debt	rent
$\hat{\beta}_{it}$	1.00										
frd	-0.05	1.00									
bq	-0.34	0.39	1.00								
err	0.00	-0.14	-0.17	1.00							
it	-0.13	0.22	0.31	-0.11	1.00						
elections	-0.04	0.02	0.06	-0.01	-0.06	1.00					
polariz	-0.01	0.02	0.03	-0.02	-0.02	-0.08	1.00				
ov	0.02	-0.03	-0.06	0.01	-0.03	0.01	-0.03	1.00			
gdppc	-0.32	0.40	0.78	-0.07	0.30	-0.03	0.03	-0.02	1.00		
debt	0.13	0.02	-0.06	-0.07	-0.12	0.07	-0.05	0.08	-0.15	1.00	
rent	-0.01	-0.18	-0.39	0.00	-0.15	0.11	-0.06	0.15	-0.22	0.01	1.00

Table 7: Appendix 3 Correlation Table

Classification Bucket of Ilzetzki et al. (2017)	Code
No separate legal tender	1
Pre announced peg or currency board arrangement	2
Pre announced horizontal band that is narrower than or equal to +/-2%	3
De facto peg	4
Pre announced crawling peg	5
Pre announced crawling band that is narrower than or equal to +/-2%	6
De factor crawling peg	7
De facto crawling band that is narrower than or equal to +/-2%	8
Pre announced crawling band that is wider than or equal to +/-2%	9
De facto crawling band that is narrower than or equal to +/-5%	10
Moving band that is narrower than or equal to +/-2% (i.e., allows for both appreciation and depreciation over time)	11
Managed floating	12
Freely floating	13
Freely falling	14
Dual market in which parallel market data is missing.	15

Table 8: Appendix 4 Classification of exchange rate regimes using Ilzetzki et al. (2017)

Country	Year of adoption	Year of abandonment
Albania	2009	.
Armenia	2006	.
Australia	1993	.
Brazil	1999	.
Canada	1991	.
Chile	1991	.
Colombia	1999	.
Czech Republic	1998	.
Dominican Republic	2012	.
Finland	1993	2000
Ghana	2007	.
Guatemala	2005	.
Hungary	2001	.
Iceland	2002	.
India	2015	.
Indonesia	2005	.
Israel	1992	.
Korea	1998	.
Mexico	1999	.
Moldova	2010	.
New Zealand	1990	.
Norway	2001	.
Paraguay	2011	.
Peru	1994	.
Philippines	2002	.
Poland	1998	.
Romania	2005	.
Slovak Republic	1995	2009
Spain	1993	2000
South Africa	2000	.
Sweden	1993	.
Switzerland	2000	.
Turkey	2006	.
Uganda	2011	.
United Kingdom	1993	.
United States	2012	.

Table 9: Appendix 5 List of countries that adopted inflation targeting

Country name	Adoption of rules	Country name	Adoption of rules
Albania	no	Djibouti	no
Algeria	no	Dominica	yes
Antigua and Barbuda	yes	Dominican republic	no
Argentina	yes	Ecuador	yes
Armenia	yes	Egypt	no
Australia	yes	El Salvador	no
Austria	yes	Equatorial Guinea	yes
Azerbaijan, rep. of	no	Estonia	yes
Bahamas, the	no	Ethiopia	no
Bahrain, Kingdom of	no	Finland	yes
Bangladesh	no	France	yes
Barbados	no	Gabon	yes
Belarus	no	Gambia, the	no
Belgium	yes	Georgia	yes
Belize	no	Germany	yes
Benin	yes	Ghana	no
Bhutan	no	Greece	yes
Bolivia	no	Grenada	yes
Botswana	yes	Guatemala	no
Brazil	yes	Guinea	no
Brunei darussalam	no	Guinea Bissau	yes
Bulgaria	yes	Guyana	no
Burkina Faso	yes	Haiti	no
Burundi	yes	Honduras	no
Cameroon	yes	Hungary	yes
Canada	yes	Iceland	yes
Central African Republic	yes	India	yes
Chad	yes	Indonesia	yes
Chile	yes	Iran	yes
China,p.r.: mainland	no	Ireland	yes
Colombia	yes	Israel	yes
Congo	yes	Italy	yes
Congo, dem. rep. of	no	Jamaica	yes
Costa Rica	yes	Japan	yes
Cote d'Ivoire	yes	Jordan	no
Croatia	yes	Kazakhstan	no
Cyprus	yes	Kenya	yes
Czech Republic	yes	Kiribati	yes
Denmark	yes		

Table 10: Appendix 6 List of countries in the sample and adoption of rules

Country name	Adoption of rules	Country Name	Adoption of rules
Korea	no	Poland	yes
Kuwait	no	Portugal	yes
Kyrgyz republic	no	Qatar	no
Latvia	yes	Romania	yes
Lebanon	no	Russia	yes
Lesotho	no	San marino	no
Liberia	yes	Saudi arabia	no
Libya	no	Senegal	yes
Lithuania	yes	Singapore	yes
Luxembourg	yes	Slovak Republic	yes
Macedonia, fyr	no	Slovenia	yes
Madagascar	no	South africa	no
Malaysia	yes	Spain	yes
Maldives	yes	Sri Lanka	yes
Mali	yes	St. Kitts and Nevis	yes
Malta	yes	St. Lucia	yes
Marshall islands	no	St. Vincent and the Grenadines	yes
Mauritania	no	Sudan	no
Mauritius	yes	Suriname	no
Mexico	yes	Swaziland	no
Micronesia, fed.sts.	no	Sweden	yes
Moldova	no	Switzerland	yes
Mongolia	yes	Syrian arab republic	no
Morocco	no	Tajikistan	no
Myanmar	no	Tanzania	yes
Nepal	no	Togo	yes
Netherlands	yes	Trinidad and tobago	no
New Zealand	yes	Tunisia	no
Nicaragua	no	Turkey	no
Niger	yes	Turkmenistan	no
Nigeria	yes	Uganda	yes
Norway	yes	Ukraine	no
Pakistan	yes	United Kingdom	yes
Panama	yes	United States	yes
Papua new guinea	no	Uruguay	yes
Paraguay	yes	Venezuela, rep. bol.	no
Peru	yes	Zambia	no
Philippines	no	Zimbabwe	no

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Table 11: Appendix 6' List of countries in the sample and adoption of rules (cont'd)