Can fiscal rules improve financial markets access for developing countries ?

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Abstract

Several countries have introduced fiscal rules to deter fiscal profligacy, enhance the credibility of fiscal policy and reduce borrowing costs. In this paper, we examine the strength of fiscal rules in terms of improving financial markets access for developing countries. We use entropy balancing and various propensity score matching as well. We find that the adoption of fiscal rules reduces (increases) sovereign bond spreads (sovereign debt ratings) in a sample of 36 developing countries, which are part of the JP Morgan Emerging Markets Bond Index Global (EMBIG), over the period 1993-2014. We explain this finding by the credibility of fiscal policy channel: more credible governments are rewarded in the international financial markets with low sovereign bond spreads and high sovereign debt ratings. These results are robust to a wide set of alternative specifications. We also show that this favorable effect is sensitive to several country's structural characteristics. Our findings substantiate that the adoption and sound implementation of fiscal rules is a substantial instrument for policy makers to improve developing countries' financial markets access.

Keywords

Fiscal rules, Bond spreads, Sovereign debt ratings, Entropy balancing.

JEL Codes

H11, F34, G15.

1. Introduction

Fiscal policy is an important channel through which developing countries (DCs) can operate to accelerate their development process by reducing inequalities (Azzimonti et al., 2014; Larch and Turrini, 2010; Milasi, 2013), improving economic growth (Stiglitz, 2015; Summers, 2014) and well-being (Bom and Ligthart, 2014; Ganelli and Tervala, 2016). To be more effective in addressing these development challenges, any fiscal policy must be sound (Dabla-Norris et al., 2010; Hameed, 2005; Prakash and Cabezon, 2008, etc.). Thus, mastered debt and sound public finances are key factors in mobilizing financial resources in developing countries (Reinhart et al., 2003; Reinhart and Rogoff, 2010, etc.).

The role of fiscal rules in improving fiscal outcomes is stressed in the literature (Corbacho and Schwartz, 2007; Debrun et al., 2008; Debrun and Kumar, 2007; Deroose et al., 2006; Guerguil et al., 2017; Kopits, 2004; Schaechter et al., 2012; Tapsoba, 2012). However, few studies have shed light on the link between fiscal rules and financial markets access in DCs (example includes (Afonso and Jalles, 2013), and (Thornton and Vasilakis, 2017) that investigate the effects of fiscal rule on risk premia in a mixed sample of advanced and developing countries. Nevertheless, the effects of fiscal rules might not be similar depending of the type of economy). The originality of this paper is that it supports the literature by exploring both the heterogeneity and the interactive effects of various types of fiscal rules on financial markets access in developing countries. It then distinguishes balanced budget rules, debt rules, expenditure rules and their interactions. It also handles self-selection problem by using an effective empirical methodology, namely entropy balancing, and alternative matching methods as well.

We consider two measure of financial markets access in this paper (namely sovereign bond spreads and sovereign debt ratings). Sovereign debt rating is an assessment of credit risk i.e. the possibility that the debtor will not fulfil its obligations in full and on time (Ferrucci, 2003). Thus, this risk of default depends on the fundamental characteristics of the issuer and the ability of the lender to enforce the contract. While bond spreads reflect market risk- the possibility that secondary market bond prices may move against the bondholder- and liquidity risk which is the risk that investors will not be able to liquidate their portfolios without depressing secondary market prices. The proponents of efficient market hypothesis argue that investors are rational and able to exploit all the available information to discriminate among borrowers. Indeed, (Edwards, 1984) highlights that asset prices always reflect the information publicly available, as evidenced by the yield differential on bonds issued by sovereign borrowers

with different credit ratings and macroeconomic characteristics. If efficient market hypothesis holds, investors and rating agencies share the same interpretation of body of public information pertaining to sovereign risks (Cantor and Packer, 1996). However, opponents of this hypothesis emphasize that market failures and imperfect information lead to distortions in assets pricing (Calvo and Mendoza, 1996; Chari and Kehoe, 1997).

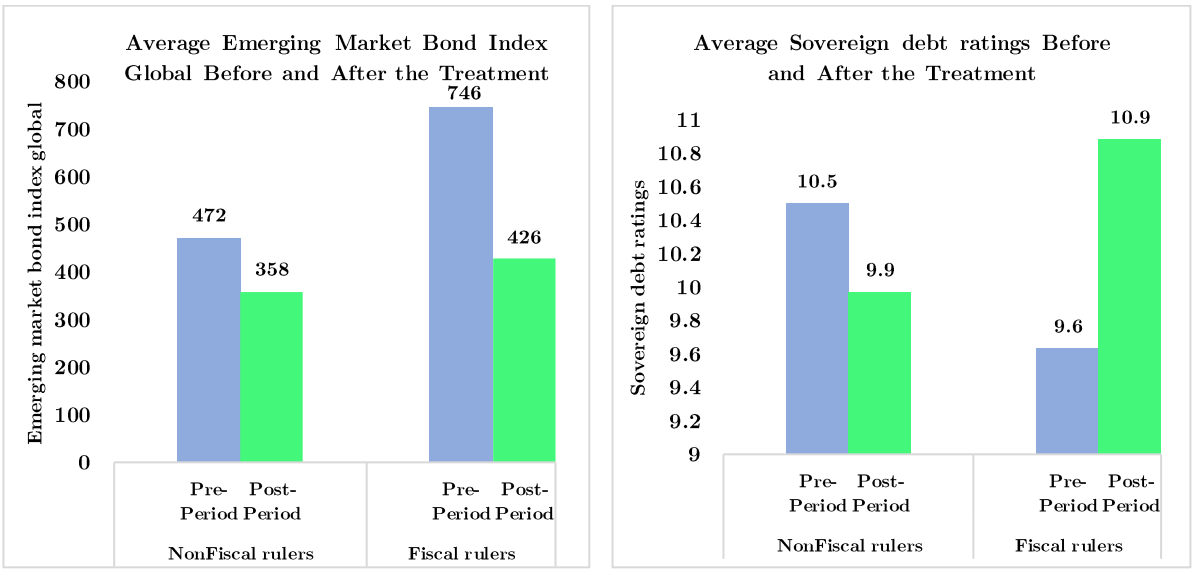

Figure 1: Emerging market bond spreads and sovereign debt rating before and after fiscal rules adoption

Better financial markets access is materialized by lower bond spreads and higher sovereign debt rating. Figure 1 illustrates the change in the average bond spreads and debt ratings, for countries having adopted FR relative to Non-FRulers[1]. The evidence is clear that adopting fiscal rule is associated with lower bond spreads and higher debt rating in developing countries.

Our estimates for a panel of 36 emerging markets economies over the period span from 1993 to 2014 show that the adoption of FR matter for financial markets access in DCs. Indeed, countries which have implemented FR show a lower sovereign bond spreads as well as a higher sovereign debt rating. Regarding the types of fiscal rules, we find that budget balanced rules (BBR) and debt rules (DR) significantly improve financial markets access while expenditures rules (ER) worsen this access. We explain this negative effect of expenditure rule by a diminishing marginal gain of an additional rule (Schaechter et al., 2012) although having multiple fiscal rules may be more binding

[1] The cut-off date for Non-FRulers is define as the mid-year period between the first time that a country adopts a fiscal rule (1993 in our case) and the sample end-year (2014) (see Minea and Tapsoba, 2014; Mishkin and Schmidt-Hebbel, 2007). It results that 2003 is the date separating the pre and post fiscal rule periods in the group of Non-FRulers. The cut-off dates for FRulers are the years of adoption of FR.

than a single rule. These results are robust to a set wide of alternative specifications of the entropy balancing method, and the use of alternative matching method.

Our findings suggest that DCs could improve their financial markets access by adopting fiscal rules. More specifically they should give more importance to BBR and DR as they are valued by financial markets in terms of lower bond spreads and higher rating.

The remainder of the paper is structured as followed. Section 2 discusses the related literature. Section 3 describes the data, provides some stylized facts and details the underlying method. Section 4 summarizes the main econometric results. Section 5 explores their sensitivity. Section 6 examines the transmission mechanisms. Section 7 concludes with some policy messages.

2. Related literature

A fiscal policy rule is a permanent constraint on fiscal policy, expressed as a summary indicator of fiscal performance, such as the government budget deficit, borrowing, debt, or a major component thereof (Kopits and Symansky, 1998). (Kopits and Symansky, 1998) identify various rationale for the adoption of fiscal policy rule. Indeed, fiscal rules aim to (i) foster macroeconomic stability, (ii) support others financial policies, (iii) maintain fiscal sustainability, (iv) avoid negative spillovers within a currency union[2], and (v) ensure the credibility of government policies over time.

(Schaechter et al., 2012) emphasize on fiscal responsibility and debt sustainability by arguing that rules aim at correcting distorted incentives and containing pressures to overspend in good times. In fact, nearsighted governments (Rogoff, 1987) run large budgetary deficits. Also, as noted by (Debrun and Kumar, 2007), the "common pool problem[3]" also lead to large deficits. Overspending in good times could result from a "voracity effect" (Tornell and Lane, 1999) and undermine countercyclical fiscal policy. In currency unions, (Kumar et al., 2009) state that supranational rules are also aimed at internalizing the regional costs of fiscal indiscipline and establish a framework for better coordination of the monetary-fiscal policy mix. Moreover, the political economy insight that political decision-makers' focus on re-election undermining fiscal discipline to the detriment of future generations (Beetsma and Debrun, 2004; Ribeiro and Beetsma, 2008) and the negative impact on growth inflicted by fiscal burden (Panizza and Presbitero, 2014) could increase deficits

[2] See also (Antonakakis and Vergos, 2013) for more evidences.

[3] Since special interest groups or "constituencies" do not internalize the overall budgetary impact of their competing demands.

and hamper fiscal responsibility. The proliferation of FR is due to the fact that rising public debt ratios since the 1970s cannot go on indefinitely without raising concerns about the government's capacity to face its obligations in full i.e. government solvency. From the point of view of (Eyraud et al., 2018), fiscal rules can help to improve the government's fiscal credibility in three possible ways: (i) by tying politicians' hands, (ii) by signaling an intrinsic commitment to fiscal responsibility, or (iii) by crystallizing political consensus on a specific standard of fiscal responsibility across political parties. Consequently, successful rules reassure economic agents, reducing borrowing costs for policymakers and providing resources to buffer the economy against shocks or to finance policies promoting long-term growth. Capping governments deficits, debts or expenditures is viewed as a way to deter fiscal profligacy (Eyraud et al., 2018). They aim to obligate the government to be cautious about its finance and prevent policy mistakes that could jeopardize solvency. (Hausmann, 2004) observes that emerging market economies would benefit from fiscal rules that aim not only at eliminating deficits and reducing debt ratios but also, more importantly, at containing the risk in the composition of the debt.

As in the most comprehensive analyses (Debrun et al., 2008; Debrun and Kumar, 2007; Deroose et al., 2006; Schaechter et al., 2012; etc.), we focus in this paper on national rules. The rationale of this choice is the limited changes in supranational rules over the last two decades and the higher role played by national rules. What are the macroeconomic effects of adopting fiscal rules? According to (Kopits and Symansky, 1998), the economic effects of fiscal policy rules are multiples. In fact, they influence the level and composition of government expenditures and taxation, inflation, external debt and economic growth. There is a bulk of empirical literature which find a positive effect of FR on fiscal outcomes, economic growth, and lower interest rates (Afonso and Jalles, 2013; Badinger and Reuter, 2017; Bayoumi et al., 1995; Caselli et al., 2018; Dahan and Strawczynski, 2013; Eyraud et al., 2018; Fabrizio and Mody, 2006; Fatás and Mihov, 2006; Feld et al., 2017; Hallerberg et al., 2009; Heinemann et al., 2018; Iara and Wolff, 2014; Johnson and Kriz, 2005; Kopits, 2004; Kumar et al., 2009; Kydland and Prescott, 1977; Neyapti, 2013; Perry, 2004; Poterba and Rueben, 1999; Tapsoba, 2012; Thornton and Vasilakis, 2017; etc.). For instance, (Badinger and Reuter, 2017) provides evidence that stringent fiscal rules enhance fiscal policy outcomes in terms of lower deficits, lower interest rate and lower output volatility. In the same vein, (Debrun et al., 2008) study the effect of fiscal rules on fiscal policy outcomes (overall and cyclically adjusted primary balance, debt level). They use the lagged fiscal rule index

and a dummy for the commitment form of fiscal governance (centralized vs. decentralized) as instruments for fiscal rules. They find that FR significantly increase fiscal performance and this effect is not different between the least squares and instrumental variable estimates. (Perry, 2004) argues that Latin American economies—subject to high macroeconomic volatility, which is often aggravated by the procyclical stance adopted under various fiscal adjustment programs—ought to follow a rule that incorporates a countercyclical stance through a structural balance target or a stabilization fund.

The positive effect of FR on fiscal performance need to be interpreted with some caution since it could reflect the effect of omitted variables (Schaechter et al., 2012). The political commitment to fiscal discipline is a potential omitted variable in the sense that it would trigger both the adoption of fiscal policy rules and better fiscal performance.

In addition, strict application of fiscal rules may be counter-productive in cases where economic policy measures may improve the fiscal stance in the long-term, the short-term fiscal burden notwithstanding. This applies particularly to two instances: First, public investment may stimulate growth and thus improve the debt-to-GDP situation, while giving rise to numerous controversial issues regarding nature, size and crowding-out (Mourougane et al., 2016). Second, structural reforms are widely claimed to be necessary in order to foster growth (Fiori et al., 2012; Griffith et al., 2007; Griffith and Harisson, 2004), while less attention has been given to the fiscal implications of structural reforms. The reputational costs of breaching rules matter more than the threat of illusory financial sanctions (Eyraud et al., 2018) because: (i) sanctions exacerbate the financial difficulties of already distressed governments, limiting the appropriateness of such sanctions and their credibility in bad times; (ii) markets would be expected to reward – with lower yields – the ability of rules to shape both current and future fiscal behavior (e.g. with the activation of formal enforcement procedures). (Milesi-Ferretti, 2004) investigates the issue of whether fiscal rules lead to genuine fiscal adjustments or simply encourage the use of "creative accounting" (that is say compliance with a fiscal rule is just an illusion). To do so, he develops a model in which fiscal rules are imposed on "measured" fiscal variables, which can differ from "true" variables. He finds that rules that are imposed when the budget is not transparent yield more creative accounting and less fiscal adjustment. Furthermore, fiscal rules may impose severe constraints on governments willing to undertake structural reforms with associated up-front costs. (Beetsma and Debrun, 2004) analyze the trade-off between

short-term stabilization and long-term growth in the context of the euro area's Stability and Growth Pact. They find that sometimes fiscal rules may need to be relaxed for countries that are actively pursuing much-needed structural reforms. In the same vein, (Sajedi and Steinbach, 2019) quantify the short-run costs and long run fiscal benefits of reforms and find that short run output losses are alleviated by long run output gains. They suggest a good design and interpretation of legal fiscal regimes which account for the interdependency between fiscal policy and structural reforms. Indeed, they argue that future institutional arrangements should reflect that enforcement of fiscal adherence should not be pursued as short-term objective per se but rather incorporate the positive long-term fiscal effects associated with sound structural policies.

The role of compliance has been a subject matter of many studies. Indeed, (Schaechter et al., 2012) stress that poor fiscal outcomes can coexist with the presence of fiscal rules if these later are not soundly implemented. (Drazen, 2004) examines how properly designed fiscal rules can be a useful means for building reputation and can serve as a disciplining device, if they are accompanied by various procedural rules—including those that prevent creative accounting practices. (Schick, 2004) emphasizes the critical role of political will in the success of any fiscal policy rule, when supported by appropriate procedural rules. He notes that the literature on fiscal institutions and budgetary process neglects political will and fails to distinguish between formal rules and informal practices.

3. Data and methodology

3.1.1. Data

We work on a panel of 36 emerging markets economies which are part of the JP Morgan Emerging Markets Bond Index Global. Our study, dictated by data availability, cover the period 1993-2014. The dependent variables in this study comprises bond spreads and sovereign debt rating[4], respectively. Bond spreads data are derived from DataStream while sovereign debt rating stems from (Kose et al., 2017). The data on control variables originate from the World Bank's World Development Indicators, (Chinn and Ito, 2006), (Reinhart and Rogoff, 2008), (Ilzetzki et al., 2017), (Dreher et al., 2010, 2008), (Batini et al., 2006), (Balima et al., 2017a), (Roger, 2009), (Rose,

[4] This variable is an annual average of foreign currency long-term sovereign debt ratings by the three most important agencies-Standards and Poor's, Moody's and Fitch Ratings, which are available in Bloomberg on a daily basis (Kose et al., 2017). These ratings are converted to a numerical scaled index. Higher value of the index indicates better rating.

2007), (Minea and Tapsoba, 2014), (Sturm and De Haan, 2001) and (Debrun et al., 2017).

Our treatment variable is a dummy which is set to 1 if a country had adopted a fiscal rule and 0 otherwise. It comes from (Schaechter et al., 2012). Our sample embodies 232 country-year observations with fiscal rules in place (units of analysis or treated units) and 560 country-year observations without fiscal rules in place (units of controls). Thus, the potential control group is up to 2 times larger than the treatment group. This allows us to obtain a weighted control group for our treatment group.

Drawing from the large literature on the adoption of fiscal rule and the determinants of bond spreads (Akitoby and Stratmann, 2008; Badinger and Reuter, 2017; Baldacci et al., 2008; Balima et al., 2017a; Bayoumi et al., 1995; Bellas et al., 2010; Edwards, 1984; Eichengreen and Mody, 1998; Eichler, 2014; Feld et al., 2017; Heinemann et al., 2018; Iara and Wolff, 2014; Johnson and Kriz, 2005; Kopits and Symansky, 1998; Kumar et al., 2009; Min, 1998; Poterba and Rueben, 1999; Tapsoba, 2012; etc.) we retain a group of matching variables capturing factors that influence simultaneously the probability of adopting fiscal rule and bond spreads, that is:

(1) the growth rate of gross domestic product which controls the economic cycle and monetary conditions. This variable is assumed to have a negative effect on spreads. Indeed, economies with high GDP growth rate can easily repay their borrowing compared to countries with low GDP growth rate.

(2) the inflation rate which is the basic indicator of macroeconomic stability. It positively affects spreads, as, for example, monetary financing of the budget deficit can lead to high levels of inflation, which increase the cost of capital (equipment, etc.).

(3) the ratio of debt to gross domestic product. It is recognized that a high debt ratio increases, all other things being equal, the risk of default and therefore the spreads. This can be explained by the fact that a country that is heavily indebted will spend more money on debt service payments[5].

(4) the payment defaults. It is a dummy variable that is worth 1 if a country has failed or restructured its debt (which disadvantages investors) in a given year and 0 otherwise. According to (Reinhart et al., 2003) a country may be the victim of "debt intolerance[6]" when it fails at least once in its history (i.e. a serial defaulter). The lack of payment further weakens its institutions (budgetary and financial institutions) and

[5] Debt service is the total government expenditure on debt repayment (principal + interest), often expressed as a percentage of GDP.

[6] Debt intolerance is the inability of emerging markets to manage levels of external debt that would be manageable for developed countries under the same circumstances (Reinhart et al., 2003).

makes them less able to cope with possible debt problems and future defaults. A country can sustainably emerge from debt intolerance if it reduces both its public and external (public and private) debt (Reinhart and Rogoff, 2008). Defaulting countries are penalized in financial markets by high spreads.

(5) the total currency reserves in months of imports. This variable is a good indicator of short-term distress for developing economies (Cantor and Packer, 1996). For instance, this variable is considered by the IMF as an appropriate indicator for reserve needs for countries with limited access to capital markets. It is expected to negatively affect bond spreads. It measures the country's ability to repay foreign debt denominated in foreign currencies. The higher the ratio of reserves in months of imports is; the lower are bond spreads, *ceteris paribus*.

(6) the FDI net inflows as share of GDP that measures the capacity of a given country to attract foreign investors. Theoretically, this variable negatively affects sovereign spreads insofar as private investment would help to improve macroeconomic indicators such as employment, growth and to some extent external equilibrium.

(7) a political risk which captures the governance quality. It is a composite measure of the quality of governance. It represents a simple average of ICRG political variables (Arezki et al., 2016). This variable is supposed to reduce sovereign bond spreads as sound institutions reinforce investors' confidence towards a given country.

(8) capital openness. It captures the degree of financial openness. The expected effect of this variable is ambiguous. Indeed, an increased openness could favor market access if it heightens economic growth (Chinn and Ito, 2006). In the opposite, capital openness, by increasing income inequality (Furceri and Loungani, 2018), could reduce financial market access for developing countries. Moreover, capital account openness could render developing countries more shock-prone areas.

(9) and finally, we account for migrant remittances following the recent literature on the determinants of bond spreads (Balima and Combes, 2019). We expect this variable to reduce bond spreads given that it plays an important role in overcoming poverty and improving life standards in developing countries.

Table A1, Table A2 and Table A3 in the appendix summarizes the different variables used in this paper and lists all the countries studied, respectively.

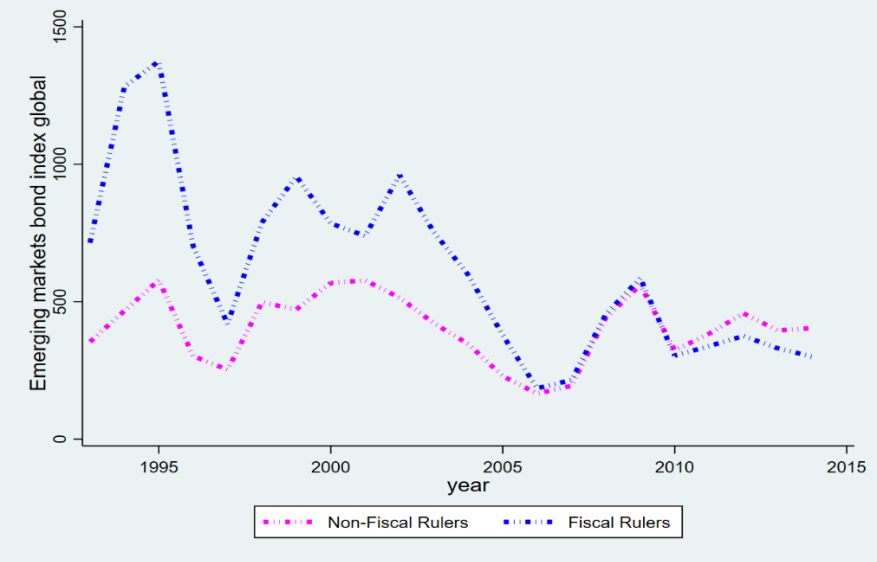

Figure 2 : evolution of bond spreads in treated and control groups (1993-2014)

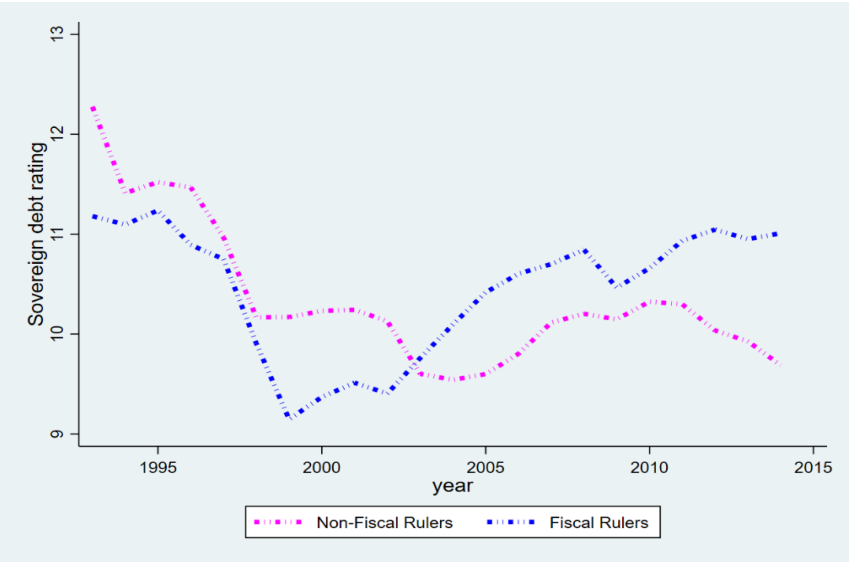

Figure 3 : evolution of debt rating in treated and control groups (1993-2014)

The above figures (figure 1 and figure 2) show the evolution of bond spreads and debt rating both in our treated and control groups. We observe a downward trend of bond spreads (upward trend of debt rating) in the treated group over the sample period. A close look at figure 2 clearly shows that countries with fiscal rule in place have faced high bond spreads until 2006. Bond spreads are similar for both groups between 2006 and 2010. However, fiscal rulers outperform Non-fiscal rule in 2010 onwards. Indeed, fiscal rules adoption could have a negative effect (positive effect) on bond spreads (sovereign debt rating).

The introduction of fiscal rules has been increased since 2000. The number of fiscal rulers has increased by 15 countries between 2000 and 2010. In our sample, budget balanced rules are more widespread, followed by debt rules and expenditures rules (figure 3).

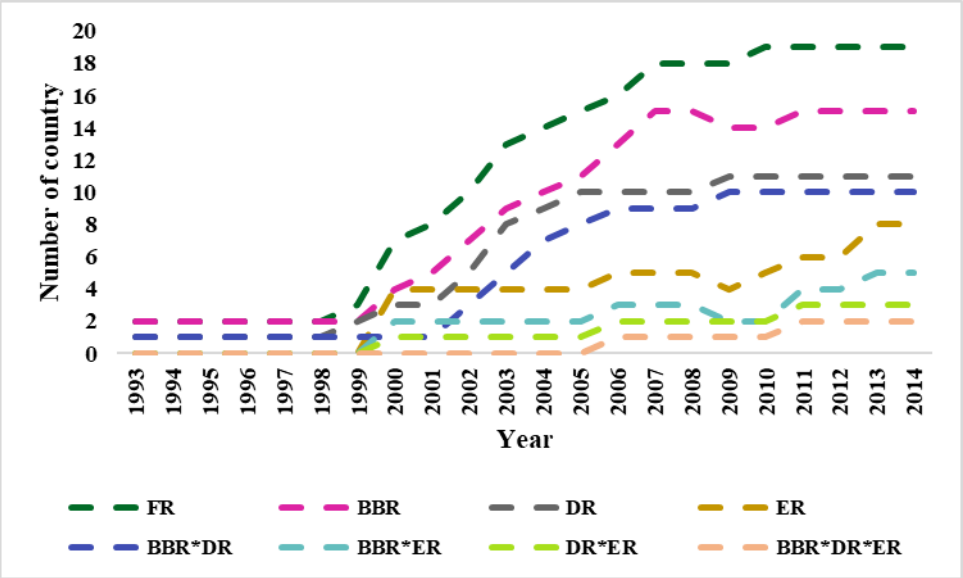

Figure 4 : number of fiscal rulers over years

3.1.2. Underlying method

Our objective is to analyze whether the adoption of fiscal rules improve financial market access in developing countries. Financial market access is appreciated in this paper by two alternative variables: sovereign bond spreads and sovereign debt rating.

The main challenge in our empirical investigation is to determine a causal relationship between the adoption of FR and the conditions by which developing countries access financial market. The motives for which DCs implement FR i.e. fiscal profligacy, political risk, lack of liquidity, etc. could be associated with country macroeconomic conditions and its political situation as well. We address this existing endogeneity by using a matching approach (as classical linear regressions are not so much reliable).

In our analysis, countries which have adopted FR (fiscal rulers hereafter) represent the treated group. The units of analysis are country-year observations, observations with FR in place constitute the treatment group while observations without FR represents the control group. The average treatment effect on the treated (ATT) is given by:

$$ATT = E[(Y_{i1} - Y_{i0}) | FR=1] = E[Y_{i1} | FR=1] - E[Y_{i0} | FR=1] \qquad EQ(1)$$

where FR is the FR dummy variable in country i, Y_{i1} is the value of spreads (debt rating) when country i has Non-FR and Y_{i0} if it adopt FR, $Y_{i0} | FR=1$ is spreads (debt rating) value that would have been observed if Non-FR country had adopt FR

and, Y_{i1} $/FR=1$ the spreads (debt rating) really observed on the same Non-FR country.

EQ (1) means that the comparison between spreads (debt rating) observed in Non-FR countries and spreads (debt rating) observed in the same countries if they had adopted FR would give us an unbiased estimate of the ATT. However, the main difficulty here is that this second term on the right side of this equation is unobservable. We cannot observe spreads (debt rating) of Non-FR country had it adopt FR.

With a random choice of Non-FR, we can simply compare the sample mean of the Non-FR countries and that of FR countries to bypass this difficulty. However, the choice of adopting FR may be dictated by some observable factors (political institutions, macroeconomic conditions, etc.) that also determine spreads (debt rating). This can lead to self-selection. Then, comparing the mean value of spreads (debt rating) between the two samples can generate a "selection on observables" problem, biasing linear regression method (Lin and Ye, 2007).

The estimate of the ATT under unconfoundedness[7] (or conditional independence) is defined as follows:

$$ATT=E[Y_{i1}|FR=1,\ X_i\ ]\ -\ E[Y_{i0}|FR=0,\ X_i\ ] \qquad EQ(2)$$

where we have replaced $E[Y_{i0}|FR=1,\ X_i\ ]$ with $E[Y_{i0}|FR=0,\ X_i\ ]$

Following the recent literature on impact evaluation, we use entropy balancing coined by (Hainmueller, 2012) and implemented by (Neuenkirch and Neumeier, 2016) and (Balima, 2017). Entropy balancing consists of two principal steps. The first step requires to compute weights that are assigned to the control units (Non-fiscal rulers here). In the second step, it suggests using the weights obtained in the first step in a regression analysis with the treatment variable (fiscal rule adoption) as explanatory variable[8]. We then balance fiscal rulers and Non-fiscal rulers based on observable characteristics. Thus, the average difference in bonds spreads and debt rating between fiscal rulers and the "closest" Non-fiscal rulers should be explained by the adoption of rules.

Entropy balancing has several advantages over other treatment effect estimators as it combines matching and regression analysis. It outperforms classical regression-based approach as well as matching on the propensity scores methods given that it is

[7] Unconfoundedness implies that all factors that influence the treatment and the outcome have to be observed by the researcher (Caliendo and Kopeinig, 2008).

[8] It is also possible to include additional control variables used to compute the weights in the first step. As indicated by (Hainmueller, 2012) and (Neuenkirch and Neumeier, 2016), this is similar to including control variables in a randomized experiment and increases estimation efficiency.

non-parametric (there are no concerns regarding misspecification of the functional form of the model which could biases the results). It also rules out multicollinearity issues as the reweighting mechanism make the treatment variable orthogonal with respect to the covariates.

In sum, entropy balancing is more effective than other matching methods in balancing the covariate between the treatment and the control group. For example, in propensity score matching methods, the control group is comprised of only a subset of the units that are not subject to treatment[9] (Diamond and Sekhon, 2013; Hainmueller, 2012; Neuenkirch and Neumeier, 2016). Otherwise, each untreated unit either receives a weight equal to 0, in the event it does not represent a best match for a treated unit, or equal to 1, in the event it does represent a best match for one treated unit (Neuenkirch and Neumeier, 2016)[10]. Thus, low covariate balance could bias the treatment effects estimates. However, in the case of entropy balancing, the vector of weights assigned to the units not exposed to treatment can contain any nonnegative values. In this later situation, the constructed control group adequately reflect the treated group[11].

In sum, entropy balancing addresses the panel structure of our data by combining a reweighting scheme with a regression analysis (Neuenkirch and Neumeier, 2016). It is possible, especially, to control for both country and time-fixed effects as well in the regression analysis[12]. Including country-fixed effects help to account for potential unobserved heterogeneity across Non-fiscal rulers and fiscal rulers. Indeed, fiscal rulers and Non-fiscal rulers may differ (beyond the set of factors used to balance them) in terms of their specific structural characteristics. The inclusion of country-fixed effects allows then to account for country specific time-invariant factors that explain differences in terms of financial market access in developing countries.

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[9] For example, with propensity score matching (nearest neighbor matching for example), each treated unit is matched with the one untreated unit that is closest in terms of a metric balancing score.

[10] Note that propensity score matching allow for replacement, meaning that an untreated unit can be used multiple times as a match. It then allows for weights equal to any non-negative integer. However, (Caliendo and Kopeinig, 2008) underscores that matching with replacement improves the quality of the matching in terms of covariate balance, but reduce its efficiency give that the number of observations used to estimate the ATT decreases.

[11] Entropy balancing is then view as a generalization of conventional matching methods (Neuenkirch and Neumeier, 2016). Indeed, using Monte Carlo simulations and empirical applications as well, (Hainmueller, 2012), shows that entropy balancing outperforms other matching methods namely propensity score matching, nearest neighbor matching, genetic matching, in terms of estimation bias and mean square error.

[12] This is the second step of the entropy balancing method.

4. Empirical results

4.1. Results

In Table 1, we show the sample means of all matching variable both for treated (column 1) and control groups (column 2). The differences in means between these groups and the related t-statistics and p-values are shown in column 3.

The figures reveal that times during which fiscal rules are in place notably differ from times during which there are no fiscal rule in place. This is valid for almost all relevant pretreatment factors. Indeed, the political situation and macroeconomic conditions is better in countries with fiscal rule in place as compared to country-year observations without fiscal rule. For instance, fiscal rulers experience a low inflation, low default, high FDI inflows, high capital account openness.

Given these descriptive statistics it is crucial to select an adequate control group before estimating the treatment effect when we use matching approach. Otherwise, the estimated treatment effect of fiscal rule on financial market access might be biased.

Table 1: Descriptive statistics

	[1]	[2]	[3]=[1] – [2]		
	NonFR	**FR**	**difference**	**t_value**	**p_value**
Lag GDP/growth	4.043	4.128	-.085	-.25	0.798
Lag Debt	45.638	50.621	-4.984	-2.1	0.035
Lag FDI/inflows	3.212	4.021	-.808	-2.5	0.013
Lag Inflation	37.529	5.798	31.732	1.9	0.06
Lag Reserves/months	5.058	5.21	-.154	-.55	0.594
Lag Capital openness	-.152	.555	-.707	-6.65	0.000
Lag remittances/GDP	4.023	2.481	1.542	4.25	0.000
Political risk	65.141	64.59	.551	.8	0.429
Lag Default	.127	.073	.054	2.1	0.033
Observations	**413**	**197**			

Notes: This Table presents the pre-weighting sample means of the matching covariates for country-year observations where FR where in place (the treatment group) in column [2] and country-year observations where no FR were in place (the potential control group) in column [1]. Column [3] reports the differences in means between treated and control group, and the corresponding t-test statistics and p-values.

In Table 2, we construct a synthetic control group (column 4) and compares the sample means of all matching covariates across the treatment group (column 2) and that synthetic control group. The differences in means between these two groups are statistically insignificant. As a matter of fact, entropy balancing allows to obtain a perfect control group for our treated units.

Table 2: Covariate balancing

	[4]	[2]	[5]=[4] – [2]		
	NonFR	**FR**	**difference**	**t_value**	**p_value**
Lag GDP/growth	4.2201	4.128	0.092	0.04	0.965
Lag Debt	49.737	50.621	-0.884	-0.01	0.989
Lag FDI/inflows	4.0797	4.021	0.058	0.04	0.969
Lag Inflation	6.1624	5.798	0.364	-0.39	0.698
Lag Reserves/months	5.1667	5.21	-0.043	-0.02	0.986
Lag Capital openness	.58154	.555	0.026	0.09	0.930
Lag remittances/GDP	2.3245	2.481	-0.156	0.02	0.981
Political risk	64.638	64.59	0.048	0.09	0.927
Lag Default	.078	.073	0.005	-0.07	0.945
Weighted observations	**197**	**197**			

Notes: This Table presents the sample means matching covariates after weighting across the treated group in column [2] and the synthetic control group obtained from entropy balancing in column [4]. Column [5] shows the differences in means, the t-test statistics and the associated p-values.

Based on the synthetic control group from Table 2, we estimate the effect of fiscal rule adoption on financial markets access using weighted least square regressions. We based on different specifications and report the results in Table 3. Thus, the average treatment effect on the treated for sovereign bond spreads obtained from various sets of treatment effect estimates are presented in this Table. First, we present in column 1-4 a baseline results highlighting the effect of adopting a fiscal rule on bond spread. Second, we add country fixed effect, time fixed effect and country/time fixed effects, respectively. In columns 5-8, we include all control variable in our equation. All in all, the adoption of fiscal rule significantly reduces sovereign bond spreads. Thus, the effect of fiscal rule adoption on financial markets access is favorable since fiscal rulers show lower bond spreads. Indeed, when fiscal rule is in place, bond spreads is more than 100 basis points smaller in comparison with country-observations without fiscal rule in place (recall that these two groups of countries are similar in terms of pretreatment factors). This effect is statistically significant at 1%, especially when we include control factors.

Table 3 : The effects of fiscal rules on sovereign bond spreads

Log(EMBIG)	[1] Baseline	[2] Adding Country/FE	[3] Adding Time/FE	[4] Adding Country/Time/FE	[5] Adding Controls	[6] Adding Country/FE	[7] Adding Time/FE	[8] Adding Country/Time/FE
FR dummy	-0.255***	-0.488***	-0.0830	-0.122	-0.281***	-0.371***	-0.147***	-0.206***
	(0.0763)	(0.0905)	(0.0715)	(0.0840)	(0.0581)	(0.0848)	(0.0521)	(0.0736)
Lag GDP/growth					-0.0419***	-0.0360***	-0.0280***	-0.0281***
					(0.00796)	(0.00713)	(0.00804)	(0.00670)
Lag Debt					0.00512***	0.00778***	0.00481***	0.00732***
					(0.00120)	(0.00130)	(0.00102)	(0.000999)
Lag FDI/inflows					-0.0102	0.00485	-0.0176***	-0.00475
					(0.00631)	(0.00548)	(0.00550)	(0.00439)
Lag Inflation					0.0203***	0.0101	0.0187***	0.00316
					(0.00634)	(0.00621)	(0.00558)	(0.00515)
Lag Reserves/months					-0.0486***	-0.0591***	-0.0445***	-0.0415***
					(0.00858)	(0.0131)	(0.00730)	(0.0108)
Lag Capital/openness					-0.00815	-0.0839**	0.0118	-0.0955***
					(0.0223)	(0.0355)	(0.0190)	(0.0290)
Lag Remittances/GDP					-0.0222**	-0.119***	-0.00339	-0.0434**
					(0.0100)	(0.0247)	(0.00858)	(0.0201)
Political/risk					-0.0425***	-0.0349***	-0.0385***	-0.0342***
					(0.00393)	(0.00790)	(0.00334)	(0.00651)
Lag Default					0.898***	0.245*	1.087***	0.423***
					(0.156)	(0.139)	(0.136)	(0.112)
Constant	5.866***	7.313***	6.166***	7.316***	8.808***	9.559***	8.466***	9.405***
	(0.0557)	(0.143)	(1.410)	(0.902)	(0.283)	(0.584)	(1.049)	(0.897)
N	494	494	494	494	494	494	494	494
R2	0.022	0.531	0.283	0.732	0.457	0.695	0.648	0.833

Notes: This Table presents the effect of fiscal rule adoption on sovereign bond spreads obtained by weighted least squares regressions. The treatment variable is fiscal rule dummy. The outcome variable is sovereign bond spread. The control variables include the lagged values of the growth rate of GDP, external debt, FDI inflows, inflation rate, total reserves in months of imports, capital openness, remittances, the history of payment defaults, and political risk. Standard errors are in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

4.2. Robustness checks

To test the robustness of our results we use (i) an alternative measure of financial markets access which is sovereign debt ratings and (ii) an alternative matching method i.e. propensity score matching. First, regarding sovereign debt ratings, the adoption of fiscal rule seems to significantly increase bond ratings (Table 4). For instance, the ATT of fiscal rule adoption is up to 1 grade. This effect is highly significant at 1% level and

holds when we add country fixed effects, time fixed effects, both country and time fixed effects and covariates used to balance the two samples of countries. Second, we check the robustness of our results by using various propensity score matching (i.e. nearest neighbor matching, radius matching, local linear regression and kernel matching). As shown in Table 5, the adoption of fiscal rule significantly reduces bond spreads while their effect on sovereign debt ratings is significantly positive. When it comes to the different types of fiscal policy rules, we find that debt rules and balanced budget rules have an added effect on debt ratings and bond spreads while expenditure rules downgrade sovereign ratings in developing countries (Table 4 & 5).

Table 4 : The effects of fiscal rules on sovereign debt ratings

SOVEREIGN RATING	[1] Baseline	[2] Adding Country/FE	[3] Adding Time/FE	[4] Adding Country/Time/FE	[5] Adding Controls	[6] Adding Country/FE	[7] Adding Time/FE	[8] Adding Country/Time/FE
FR dummy	**0.668****	**0.443****	**0.482***	**0.0414**	**1.364*****	**0.630*****	**1.289*****	**0.471****
	(0.279)	**(0.222)**	**(0.290)**	**(0.228)**	**(0.191)**	**(0.187)**	**(0.197)**	**(0.182)**
N	558	558	558	558	558	558	558	558
R2	0.010	0.801	0.074	0.849	0.563	0.893	0.607	0.921
BBR dummy	**1.036*****	**0.526****	**0.634****	**-0.0144**	**1.926*****	**0.586*****	**1.717*****	**0.314***
	(0.283)	**(0.211)**	**(0.295)**	**(0.218)**	**(0.193)**	**(0.176)**	**(0.202)**	**(0.177)**
N	558	558	558	558	558	558	558	558
R2	0.024	0.810	0.115	0.857	0.577	0.896	0.635	0.924
DR dummy	**1.378*****	**1.670*****	**1.325*****	**1.090*****	**1.559*****	**1.607*****	**1.299*****	**1.303*****
	(0.279)	**(0.223)**	**(0.294)**	**(0.236)**	**(0.175)**	**(0.190)**	**(0.180)**	**(0.187)**
N	558	558	558	558	558	558	558	558
R2	0.042	0.820	0.107	0.858	0.638	0.907	0.683	0.925
ER dummy	**-1.410*****	**-0.252**	**-1.799*****	**-0.621*****	**-1.001*****	**0.168**	**-1.206*****	**-0.207**
	(0.287)	**(0.247)**	**(0.280)**	**(0.214)**	**(0.195)**	**(0.170)**	**(0.195)**	**(0.150)**
N	558	558	558	558	558	558	558	558
R2	0.042	0.795	0.237	0.882	0.570	0.911	0.653	0.947
BBR*DR	**1.750*****	**1.648*****	**1.712*****	**1.205*****	**2.078*****	**1.437*****	**1.872*****	**1.121*****
	(0.283)	**(0.194)**	**(0.313)**	**(0.214)**	**(0.164)**	**(0.166)**	**(0.183)**	**(0.183)**
N	558	558	558	558	558	558	558	558
R2	0.064	0.843	0.137	0.877	0.705	0.913	0.735	0.928
Covariates	**NO**	**NO**	**NO**	**NO**	**YES**	**YES**	**YES**	**YES**
Time FE	**NO**	**NO**	**YES**	**YES**	**NO**	**NO**	**YES**	**YES**
Country FE	**NO**	**YES**	**NO**	**YES**	**NO**	**YES**	**NO**	**YES**

Notes: This Table presents the effect of fiscal rule adoption on sovereign debt ratings obtained by weighted least squares regressions (using entropy balancing). The treatment variable is fiscal rule dummy. The outcome variable is sovereign debt rating. The control variables include the lagged values of the growth rate of GDP, external debt, FDI inflows, inflation rate, total reserves in months of imports, capital openness, remittances, the history of payment defaults, and political risk. Standard errors are in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

The positive effect of debt rules and balanced budget rules is consistent with the huge empirical literature which highlights that fiscal rules improve fiscal outcomes. In fact, better fiscal outcomes reassure financial markets and investors, reducing borrowing costs for developing countries. Regarding the negative effect of expenditure rules on financial markets access, a possible explanation is that there is a diminishing marginal gain of an additional rule although having multiple fiscal rules may be more binding than a single rule (Schaechter et al., 2012). Most countries in our sample have adopted a debt rule or/and a balanced budget rule prior to the adoption of an expenditure rule. This is particularly relevant given that debt rule and balanced budget rule are more directly linked to debt sustainability objectives than expenditure rules.

Table 5 : ATT of fiscal rule adoption using propensity score matching[13]/[14]

Treatment Variable	1-Nearest Neighbour Matching	2-Nearest Neighbour Matching	3-Nearest Neighbour Matching	Radius Matching r=0.005	Radius Matching r=0.01	Radius Matching r=0.05	Local Linear Regression Matching	Kernel Matching
DEPENDENT VARIABLE: LOG (EMBIG)								
FR Dummy	**-0.264****	**-0.229***	**-0.241****	**-0.235****	**-0.211***	**-0.224****	**-0.243*****	**-0.218*****
ATT	**(0.133)**	**(0.120)**	**(0.107)**	**(0.118)**	**(0.112)**	**(0.0877)**	**(0.0823)**	**(0.0846)**
Observations Treated/Control	483/175/308	483/175/308	483/175/308	483/175/308	483/175/308	483/175/308	483/175/308	483/175/308
Rosenbaum bounds sensitivity	1.4	1.4	1.5	1.4	1.4	1.6	1.7	1.5
Standardized biases (p-value)	0.317	0.317	0.317	0.831	0.931	0.982	0.317	0.982
Pseudo R2	0.022	0.022	0.022	0.012	0.008	0.005	0.022	0.005
BBR Dummy	**-0.378*****	**-0.391*****	**-0.335*****	**-0.420*****	**-0.339*****	**-0.329*****	**-0.356*****	**-0.336*****
ATT	**(0.132)**	**(0.119)**	**(0.122)**	**(0.139)**	**(0.114)**	**(0.101)**	**(0.0929)**	**(0.100)**
Observations Treated/Control	483/136/347	483/136/347	483/136/347	483/136/347	483/136/347	483/136/347	483/136/347	483/136/347
Rosenbaum bounds sensitivity	1.6	1.9	1.8	1.8	1.6	1.9	2	1.9
Standardized biases (p-value)	0. 076	0.300	0.574	0.834	0.927	0.786	0. 076	0.802
Pseudo R2	0.042	0.029	0.021	0.016	0.011	0.015	0.042	0.015
DR Dummy	**-0.381****	**-0.443*****	**-0.431*****	**-0.303****	**-0.333*****	**-0.280*****	**-0.384*****	**-0.293*****
ATT	**(0.152)**	**(0.144)**	**(0.135)**	**(0.126)**	**(0.119)**	**(0.100)**	**(0.0925)**	**(0.0930)**
Observations Treated/Control	483/108/375	483/108/375	483/108/375	483/108/375	483/108/375	483/108/375	483/108/375	483/108/375
Rosenbaum bounds sensitivity	1.6	1.9	1.8	1.4	1.5	1.4	1.7	1.5
Standardized biases (p-value)	0.411	0.705	0.737	0.999	0.996	0.998	0.411	0.999
Pseudo R2	0.032	0.021	0.020	0.004	0.006	0.005	0.032	0.004
ER Dummy	**0.0855**	**0.230**	**0.175**	**0.165**	**0.203**	**0.201***	**0.182***	**0.201***
ATT	**(0.202)**	**(0.165)**	**(0.153)**	**(0.157)**	**(0.137)**	**(0.116)**	**(0.106)**	**(0.109)**
Observations Treated/Control	483/68/415	483/68/415	483/68/415	483/68/415	483/68/415	483/68/415	483/68/415	483/68/415
Rosenbaum bounds sensitivity	1	1.1	1	1	1	1	1	1
Standardized biases (p-value)	0.868	0.885	0.939	0.965	0.942	0.996	0.868	0.997
Pseudo R2	0.024	0.023	0.019	0.018	0.018	0.009	0.024	0.007
BBR*DR Dummy	**-0.220**	**-0.263**	**-0.395****	**-0.299****	**-0.321****	**-0.399*****	**-0.508*****	**-0.392*****
ATT	**(0.167)**	**(0.161)**	**(0.154)**	**(0.146)**	**(0.135)**	**(0.105)**	**(0.115)**	**(0.113)**
Observations Treated/Control	483/45/398	483/45/398	483/45/398	483/45/398	483/45/398	483/45/398	483/45/398	483/45/398
Rosenbaum bounds sensitivity	1.2	1.3	1.8	1.3	1.6	1.9	2.2	1.9
Standardized biases (p-value)	0. 142	0. 086	0.326	0. 753	0. 931	0. 963	0. 143	0.968
Pseudo R2	0.053	0.064	0.044	0.031	0.018	0.013	0.053	0.013
DEPENDENT VARIABLE: SOVEREIGN DEBT RATINGS								
FR Dummy	**1.141****	**0.973****	**0.953****	**0.971****	**1.231*****	**0.879*****	**0.891*****	**0.888*****
ATT	**(0.465)**	**(0.418)**	**(0.397)**	**(0.439)**	**(0.381)**	**(0.318)**	**(0.313)**	**(0.318)**
Observations/Treated/Control	556/194/362	556/194/362	556/194/362	556/194/362	556/194/362	556/194/362	556/194/362	556/194/362
Rosenbaum bounds sensitivity	1.3	1.5	1.6	1.4	1.7	1.4	1.5	1.5
Standardized biases (p-value)	0.586	0.586	0.586	0.888	0.951	0.989	0.586	0.994
Pseudo R2	0.016	0.016	0.016	0.011	0.007	0.005	0.016	0.004
BBR Dummy	**1.310****	**1.493*****	**1.466*****	**1.770*****	**1.576*****	**1.301*****	**1.351*****	**1.027*****
ATT	**(0.538)**	**(0.467)**	**(0.428)**	**(0.450)**	**(0.413)**	**(0.356)**	**(0.353)**	**(0.330)**
Observations Treated/Control	556/155/401	556/155/401	556/155/401	556/155/401	556/155/401	556/155/401	556/155/401	556/155/401
Rosenbaum bounds sensitivity	1.6	1.7	1.8	1.9	1.8	1.7	1.7	1.7
Standardized biases (p-value)	0.321	0.731	0.652	0.830	0.979	0.931	0.321	0.892
Pseudo R2	0.028	0.016	0.019	0.017	0.008	0.010	0.028	0.012
DR Dummy	**0.811**	**1.010***	**1.046****	**1.139****	**0.922****	**0.852****	**1.144*****	**0.856****
ATT	**(0.529)**	**(0.535)**	**(0.487)**	**(0.467)**	**(0.373)**	**(0.373)**	**(0.360)**	**(0.363)**
Observations Treated/Control	556/113/443	556/113/443	556/113/443	556/113/443	556/113/443	556/113/443	556/113/443	556/113/443
Rosenbaum bounds sensitivity	1.2	1.5	1.6	1	1.1	1.3	1.5	1.3
Standardized biases (p-value)	0.575	0.720	0.696	0.978	0.993	0.999	0.575	0.999
Pseudo R2	0.026	0.020	0.022	0.011	0.007	0.003	0.026	0.003
ER Dummy	**-0.711**	**-1.058**	**-1.203***	**-0.999**	**-1.157***	**-1.313*****	**-1.289*****	**-1.330*****
ATT	**(0.787)**	**(0.711)**	**(0.698)**	**(0.709)**	**(0.616)**	**(0.495)**	**(0.464)**	**(0.498)**
Observations Treated/Control	556/68/488	556/68/488	556/68/488	556/68/488	556/68/488	556/68/488	556/68/488	556/68/488
Rosenbaum bounds sensitivity	1	1.7	1.7	1.5	1.5	1.5	1.4	1.4
Standardized biases (p-value)	0.870	0.998	0.992	0.990	0.953	0.997	0.870	0.999
Pseudo R2	0.024	0.007	0.010	0.013	0.019	0.008	0.024	0.006
BBR*DR Dummy	**1.663*****	**1.920*****	**1.833*****	**1.309*****	**1.376*****	**1.345*****	**1.732*****	**1.505*****
ATT	**(0.587)**	**(0.529)**	**(0.512)**	**(0.500)**	**(0.450)**	**(0.368)**	**(0.385)**	**(0.359)**
Observations Treated/Control	556/90/466	556/90/466	556/90/466	556/90/466	556/90/466	556/90/466	556/90/466	560/90/466
Rosenbaum bounds sensitivity	1.2	1.5	1.8	1.4	1.3	1.6	1.7	1.6
Standardized biases (p-value)	0. 287	0.225	0. 273	0. 930	0. 983	0. 959	0. 287	0. 964
Pseudo R2	0.048	0.052	0.049	0.020	0.011	0.014	0.048	0.013

Notes: This table presents the average treatment effect of the treated (ATT) of fiscal rule adoption on sovereign bond spreads (top panel of Table 5) and sovereign debt ratings (lower panel of Table 5) using propensity scores matching method. Bootstrapped standard errors based on 500 replications are reported in brackets. Standard errors are in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01.

Moreover, developing countries face large developmental needs (health and education infrastructures for example) even in quite times. The adoption of expenditure rules tends to limit spending in such infrastructures. The p-value of the standardized

[13] The interaction between expenditure rules (ER) and other types of rules yields insignificant results. These results are available upon request.

[14] See Table A13 & A14 for additional robustness check (when altering the sample). We check the robustness of the ATT with respect to the exclusion of the crisis year (2009 global recession), former USSR countries, high indebtedness, high inflation episodes and countries belonging to monetary unions.

bias (see Caliendo and Kopeinig, 2008; Lechner, 2001; Sianesi, 2004 for more details) confirms that the conditional independence assumption holds. Indeed, for this assumption to hold, the p-value associated with the standardized bias should be above the critical value of 10 per cent (Rosenbaum and Rubin, 1985). Our control variables are also relevant in explaining the probability of adopting a fiscal rule given the "fairly low" value of the pseudo R2 after matching (Caliendo and Kopeinig, 2008; Sianesi, 2004). Finally, our results do not suffer of a hidden bias as illustrated by the (Rosenbaum, 2002) sensitivity test.

By and large, our results are robust to the use of alternative measure of financial markets access and the use of alternative econometric method.

5. Sensitivity analysis: the role of structural factors

Considering heterogeneities in the macroeconomic conditions and the political situations in developing countries which are underscore in the empirical literature (Acemoglu et al., 2019, 2014, 2003, 2001; Balima et al., 2017b; Easterly, 2002; Hameed, 2005; Lin and Ye, 2009; Minea and Tapsoba, 2014; Wei, 2006; etc.), we explore the sensitivity of our results with regards to these factors.

The idea here is that structural factors can magnify or alleviate the effect of FR on financial market access. We follow the literature on impact evaluation (Guerguil et al., 2017; Lin and Ye, 2009; Tapsoba, 2012; etc.) and assess the effects of such heterogeneities. We report the results for bond spreads in Table 6a & 6b below[15]. Column 1 and 2 show the results of a simple OLS linking FR adoption to sovereign bond spreads while accounting for the estimated propensity score. The variable named FR dummy catches the mean difference in bond spreads between countries having enacted FR and those that have not. This coefficient is negative in all columns. However, the coefficient is not significant when some structural factors are controlled for. Column 3 and 4 introduce in the OLS regressions the mean propensity score and the time length[16] since a fiscal rule adoption. The following columns show the coefficients of the interactive term between a FR and a given structural factor[17].

Potential sources of heterogeneity from a macroeconomic perspective include the position of the business cycle (captured by a dummy for good times which equal one if

[15] See Table A11 & A12 in the appendix for the results regarding sovereign debt ratings.

[16] We consider at least 3 years after any adoption of fiscal rule given that the effects of fiscal rule could not occur immediately.

[17] We introduce (in equation related to Table 6a & 6b) each structural factor in isolation (without interacting with FR) on top of the interactive terms. However, we do not report these coefficients here for the sake of space.

GDP growth is above its mean value and zero otherwise), the fiscal policy stance (dummy equal 1 if the ratio of external debt stocks to GDP is above its mean value and zero otherwise), macroeconomic stability (standard deviation of the output gap), FDI inflows, government size, human capital captured by the level of education, international trade and capital account openness, inflation targeting, central bank independence and exchange rate regime. The results indicate that FR are more effective in reducing bond spreads in countries with FR especially when: (i) the fiscal policy stance is strong, (ii) the government size is high or (iii) the central bank is independent. The impact of fiscal rule on bond spreads appears to be insignificant when we account for the other type of macroeconomic factors. This suggest that the effects of fiscal rules on bond spreads are sensitive, to some extent, to the macroeconomic conditions.

From the political standpoint, we account for government stability, internal and external conflict, corruption, investment profile, law and order and ethnic tensions. Apart from the ethnic tensions, the impact of fiscal rules on bond spreads is insignificant with respect to the political factors. Indeed, the effects of fiscal rule on bond spreads are unclear in countries which show an apparent government instability, higher level of conflict (internal and external), higher level of corruption and poor investment profile.

Finally, the design of fiscal rule includes the formal enforcement procedure, the monitoring process and the presence of fiscal councils. Although the effects of fiscal rules on bond spreads is moderate, they remain significant when we account for the design of fiscal rule. The interactive effect of enforcement procedure as well as independent fiscal councils and fiscal rule is positive and significant at 10% and 1%, respectively. Countries with high score of enforcement procedure and independent fiscal agencies that monitor fiscal outturns show a higher borrowing cost (in terms of higher bond spreads). A possible explanation of this result is that a high score of fiscal design can coexists with poor fiscal outcomes. For instance, as underscore by (Schaechter et al., 2012), a high score of effective enforcement and accountability does not necessarily imply that it is also soundly implemented.

In total, our results are sensitive to many structural characteristics. The effect of fiscal policy rule adoption is unclear within some circumstances. These circumstances are mainly related to the macroeconomic conditions and the political situations.

Table 6a : Exploring the heterogeneity

Log (EMBIG)	**[1]**	**[2]**	**[3]**	**[4]**	**[5]**	**[6]**	**[7]**	**[8]**	**[9]**	**[10]**	**[11]**	**[12]**	**[13]**	**[14]**	**[15]**
FR Dummy	-0.227**	-0.166*	-0.208**	0.0493	-0.0977	-0.431**	-0.102	0.116	-0.278**	0.0184	-0.0414	-0.163	-0.0373	-0.201**	0.622
	(0.0882)	(0.0946)	(0.101)	(0.133)	(0.138)	(0.189)	(0.105)	(0.113)	(0.129)	(0.133)	(0.106)	(0.130)	(0.128)	(0.0985)	(0.890)
PSCORE		-0.291	-0.510**	-0.262	-0.310	-0.398**	-0.271	-0.104	-0.240	-0.262	-0.175	-0.203	-0.235	-0.226	-0.0114
		(0.205)	(0.248)	(0.204)	(0.197)	(0.202)	(0.208)	(0.202)	(0.206)	(0.206)	(0.207)	(0.227)	(0.192)	(0.201)	(0.204)
FR*PSM			0.695												
			(0.452)												
FR*Time Length				-0.0435***											
				(0.0124)											
Macroeconomic Factors															
FR*Good/time					-0.0558										
					(0.172)										
FR*Strong/stance						0.412**									
						(0.206)									
FR*Macro/instability							-0.00000673								
							(0.00000484)								
FR*FDI/inflows								-0.709***							
								(0.161)							
FR*Government/size									0.215						
									(0.178)						
FR*Secondary										-0.246					
										(0.174)					
FR*Trade											-0.506***				
											(0.179)				
FR*Capital/openness												-0.0149			
												(0.175)			
FR*IT/conservative													0.0695		
													(0.171)		
FR*CBI/irregular														-0.0313	
														(0.284)	
FR*Fix/regime															-0.744
															(0.892)
Constant	5.852***	5.933***	5.993***	5.924***	6.183***	6.302***	5.866***	5.962***	6.074***	5.798***	5.969***	5.935***	6.045***	5.831***	6.825***
	(0.0524)	(0.0809)	(0.0896)	(0.0810)	(0.0986)	(0.109)	(0.0852)	(0.0869)	(0.0839)	(0.103)	(0.0863)	(0.0866)	(0.0848)	(0.0829)	(0.179)
N/ R2	476/0.014	476/0.017	476/0.022	476/0.036	476/0.082	476/0.056	476/0.032	476/0.114	476/0.039	476/0.020	476/0.071	476/0.019	476/0.098	469/0.064	453/0.083

Note: Bootstrapped standard errors (with 500 replications) in brackets, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Vector X variables in isolation (without interaction with FR) are included but not reported for the sake of space.

Table 6b : Exploring the heterogeneity cont.

Log(EMBIG)	[16]	[17]	[18]	[19]	[20]	[21]	[22]	[23]	[24]	[25]
FR Dummy	-0.207	-0.0689	-0.0784	-0.132	0.142	-0.145	-0.254**	-0.300**	-0.240**	-0.203**
	(0.139)	(0.146)	(0.134)	(0.115)	(0.156)	(0.103)	(0.127)	(0.117)	(0.108)	(0.0989)
PSCORE	-0.285	-0.309	-0.304	-0.287	-0.165	-0.389*	-0.255	-0.265	-0.292	-0.245
	(0.208)	(0.208)	(0.208)	(0.206)	(0.187)	(0.200)	(0.204)	(0.208)	(0.204)	(0.201)
Political Factors										
FR*Government/stability	0.00618									
	(0.185)									
FR*External/conflict		-0.176								
		(0.179)								
FR*Internal/conflict			-0.249							
			(0.176)							
FR*Corruption				-0.121						
				(0.184)						
FR*Investment/profile					-0.397**					
					(0.178)					
FR*Law/order						-0.282*				
						(0.166)				
FR*Ethnic/tensions							0.0678			
							(0.186)			
Design										
FR*Enforcement								0.262*		
								(0.144)		
FR*Monitoring									0.157	
									(0.145)	
FR*Fiscal/Council[18]										0.566***
										(0.204)
Constant	6.030***	5.927***	6.119***	5.885***	6.196***	6.254***	6.071***	5.925***	5.933***	5.978***
	(0.107)	(0.0989)	(0.104)	(0.0894)	(0.0986)	(0.0843)	(0.100)	(0.0817)	(0.0809)	(0.0812)
N/R2	476/0.024	476/0.020	476/0.067	476/0.021	476/0.161	476/0.152	476/0.031	476/0.024	476/0.020	476/0.058

Note: Bootstrapped standard errors (with 500 replications) in brackets, * p < 0.10, ** p < 0.05, *** p < 0.01. Vector X variables in isolation (without interaction with FR) are included but not reported for the sake of space.

6. Transmission mechanisms

In this section, we investigate pathways through which fiscal rules may affect sovereign bond spreads in developing countries. We explore the relevance of five potential transmission channels: an increase in (i) the growth rate of GDP, a decrease in (ii) inflation rate, (iii) government debt, (iv) fiscal balance, and (v) macroeconomic instability. As discussed in Section 3, these variables are important determinants of bond spreads.

Following (Neuenkirch and Neumeier, 2016) and (Balima, 2017), we explore these potential transmission channels by computing the mean of these variables for (i) the treated group during times when fiscal rule was in place, (ii) the treated group focusing only on years before fiscal rule adoption, and (iii) the synthetic control group obtained via entropy balancing. We report the results in Table 7 below. The descriptive statistics indicate a significant difference between the control group obtained via entropy balancing and the treated group before fiscal rule adoption. Indeed, the latter is characterized by (i) a lower level of GDP growth (3.39 vs 4.32), (ii) a higher level of inflation rate (36.57% vs. 6.66%), (iii) a higher level of government debt (59.86 vs. 56.92%), (iv) a higher fiscal deficit (-2.31% vs. -2.23%), and (v) a higher macroeconomic

[18] A fiscal council is a permanent agency with a statutory or executive mandate to assess publicly and independently from partisan influence government's fiscal policies, plans and performance against macroeconomic objectives related to the long-term sustainability of public finances, short-medium-term macroeconomic stability, and other official objectives (Debrun et al., 2017).

instability as measure by the standard deviation of output gap (10486.79% vs. 8683.35%).

Table 7 also shows that the adoption of fiscal rule is associated with a significant drop of the five potential transmission channel variables in the treated group. The inflation rate is much smaller in the years during which fiscal rule were in place (5.87%) compared with the years before (36.57%), with the difference being significant at 5% (t = 2.2280; p-value = 0.0265). Regarding GDP growth, we also observe a higher level during fiscal rule adoption period (4.16%) compared with the period before (3.39%), and the difference is statistically significant at 10% (t = -1.7978; p-value = 0.0731). In the case of government debt, we observe a lower level public debt during fiscal rule adoption period (46.34) compared with the period before (59.86), and the difference is highly significant (t = 4.0387, p-value = 0.0001). Moreover, the level of fiscal deficit is smaller during fiscal rule adoption period (-2.31% of GDP) in comparison with the period before (-1.87% of GDP) although this difference is not statistically significant. In sum, considering macroeconomic instability is smaller in period during which there are fiscal rule in place (3787.63) as compared to period without fiscal rule in place (10486.79). this difference is highly statistically significant (t = 3.2856; p-value = 0.0011). All in all, countries under fiscal rule adoption period experience a lower inflation rate, government debt, fiscal deficit and macroeconomic instability compared to the synthetic control group, even if the growth rate of GDP growth remains lower in post-treatment observations of countries with fiscal rule in place. These stylized facts allow us to conclude that the adoption of fiscal rule is associated with an increased growth rate of GDP, a lower level of inflation, public debt, fiscal deficit and macroeconomic instability and, consequently, improve financial markets access in developing through low sovereign bond spreads and high sovereign debt ratings.

Tableau 7 : Transmission channels

	GDP growth	Inflation	Government debt	Fiscal balance	Std. Output gap
Treatment group					
Before FR adoption	3.39	36.57	59.86	-2.31	10486.79
During FR adoption	4.16	5.87	46.34	-1.87	3787.63
Control group	4.32	6.66	56.92	-2.23	8683.35

Notes: This Table presents the transmission channels of the effect of fiscal rule adoption on financial markets access. Government debt and fiscal balance are measured as shares of GDP

7. Conclusion and policy implications

We explore, in this paper, the capacity of fiscal rules to improve financial markets access for developing countries (DCs) via the reduction of their borrowing costs. Consequently, we consider a sample of 36 countries from 1993 to 2014. All in all, 232 country-year observations are associated with a fiscal rule in place (treated group) and 560 country-year observations are not associated with a fiscal rule in place (control group). We use entropy balancing method to construct a weighted synthetic group for our treated group, accounting for differences in countries' macroeconomic conditions and political situation as well. Our results contribute to the related literature in different ways.

First, we find a causal effect between the adoption of fiscal rules and both low bond spreads and high sovereign rating. The extent of this effect is quite meaningful: fiscal rules adoption lower bond spreads by around 530 basis points while it increases sovereign ranking by up to more than 1 grade.

Second, we unveil that the effect of fiscal rules adoption on financial markets access depends of the type of rule. Indeed, budget balanced rules (BBR) and debt rules (DR) significantly improve financial markets access while expenditures rules (ER) worsen this access. This latter effect can be explained by a diminishing marginal gain of an additional rule although having multiple fiscal rules may be more binding than a single rule (Schaechter et al., 2012).

Third, we find that the interaction of fiscal rules is highly beneficial in terms of low borrowing costs. Countries that adopt both BBR and DR rules can easily access financial markets as compare to the others. These results are robust to a set wide of alternative specifications of the entropy balancing method, and the use of alternative matching method (namely propensity score matching).

Finally, we find that the growth rate of GDP, the rate of inflation, the level of public debt, the level of fiscal deficit and macroeconomic instability are potential pathways through which the adoption of fiscal rule improve financial markets access for developing countries.

Our findings suggest that DCs could improve their financial markets access by adopting fiscal rules. More specifically they should give more importance to BBR and DR as they are valued by financial markets in terms of lower bond spreads and higher debt ratings.

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APPENDIX:

Table A1 : Descriptive Statistics

Variable	Obs	Mean	Std.Dev.	Min	Max
Log (EMBIG)	576	5.765	.9	-.02	8.662
Sovereign rating	679	10.319	3.282	1.333	18
FR dummy	792	.293	.455	0	1
BBR dummy	792	.241	.428	0	1
DR dummy	792	.179	.384	0	1
ER dummy	792	.096	.295	0	1
GDP growth	792	4.022	4.144	-22.934	33.736
Debt/GDP	752	47.355	29.453	.633	274.951
Political risk	765	64.974	8.861	38.79	86.58
FDI inflows	785	3.463	4.026	-15.989	50.505
Default dummy	728	.11	.313	0	1
Inflation	772	26.66	207.246	-7.114	4734.915
Reserves/months	769	5.129	3.603	.027	25.676
Capital openness	785	.065	1.379	-1.904	2.374
Remittances/GDP	741	3.568	4.522	0	26.683
IT conservative date	792	.212	.409	0	1
IT default date	792	.222	.416	0	1
CBI irregular turnover	778	.135	.342	0	1
CBI regular turnover	778	.051	.221	0	1
Trade	788	72.535	36.228	15.636	220.407
Broad money growth	764	28.092	142.974	-50.812	3280.653
Fix exchange regime	704	.922	.269	0	1
Float exchange regime	704	.067	.25	0	1
Goverment stability	765	8.113	1.714	3.33	12
Corruption	765	2.534	.894	1	5
Internal conflict	765	9.026	1.772	.42	12
External conflict	765	10.216	1.33	2.58	12
Law and order	765	3.387	1.084	1	6
Ethnic tensions	765	4.256	1.325	1	6
Output gap	792	0	25211.43	-289000	368000
Government size	792	13.634	4.1	4.483	32.284
Secondary education	792	6.261	.858	4	8
Enforcement	792	.116	.321	0	1
Monitoring	792	.11	.313	0	1
Fiscal council	792	.051	.219	0	1
Time length	792	1.436	3.313	0	19

Table A2. Definition and sources of variables

Variables	Descriptions	Sources
Sovereign bond spreads	It covers all sovereign foreign debt instruments issued by emerging countries, including international borrowings denominated in US dollars such as Brady bonds, loans, and Eurobonds with a face value of at least US$ 500 million and a maturity of 12 years.	JP Morgan, Datastream
Sovereign debt rating	Foreign currency long-term sovereign debt ratings (index ranging from 1 to 21, higher value means better rating).	Kose et al. (2017)
Debt/GDP	Total external debt stocks, % of GDP (External public and private sector debt)	
IT default date	Binary variable taking the value 1 if in a given year a country operates informally under IT, zero otherwise. When we use the default starting dates of IT, we refer to soft IT.	Rose, 2006; Minea & Tapsoba, 2014; Roger, 2009
IT conservative date	Binary variable taking the value 1 if in a given year a country operates formally under IT, zero otherwise. When we use the conservative starting dates of IT, we refer to full-fledged IT.	
CBI regular	Central banks governor's regular turnover dummy. It is equal to 1 if the change of governor take place at the end of the official mandate and 0 otherwise. This is proxy of central bank independence.	Dreher et al., 2008, 2010; Sturm and de Haan (2001)
CBI irregular	Central banks governor's irregular turnover dummy. It is equal to 1 if the change of governor take place in an irregular manner and 0 otherwise. This is proxy of central bank independence.	
Political risk	It is a composite measure of the quality of governance. It represents a simple average of ICRG political variables. Higher value indicates low political risk.	Author calculation based on ICRG data
Debt default	Dummy equal to 1 if a country did not pay its debt or restructured it with a lost for investors, and 0 if there was no payment default or debt restructuring.	Reinhart & Rogoff (2009)
Capital openness	It captures the degree of financial openness.	Chinn-Ito (2006)
Fix regime	Dummy equal 1 if ER_Fine is classified as fix regime and 0 if not	Author construction based on Ilzetzki et al. (2017)
Floating regime	Dummy equal 1 if ER_Fine is classified as floating regime and 0 if not	
FR	Dummy equal 1 if there is a fiscal rule in place and 0 if not	IMF Fiscal Rules Dataset, 2016
BBR	Dummy equal 1 if there is a balanced budget rule in place and 0 if not	
DR	Dummy equal 1 if there is a debt rule in place and 0 if not	
ER	Dummy equal 1 if there is an expenditure rule in place and 0 if not	
Enforcement	Dummy which equal 1 if there is a national formal enforcement procedure in place and 0 otherwise.	
Monitoring	Dummy which equal 1 if there is a national monitoring of compliance outside government in place, 0 if no and 0.5 if non independent.	
Fiscal council	Dummy equal 1 if there is a fiscal council in place and 0 if not.	IMF Fiscal Council Dataset, 2017
FDI Inflows	Net inflows (new investment inflows less disinvestment) in a given economy from foreign investors, divided by GDP.	
Trade	Sum of exports and imports of goods and services, % of GDP.	

Secondary education	Secondary duration refers to the number of grades (years) in secondary school.	WDI
Government size	General government final consumption expenditure, % of GDP.	
Inflation rate	Annual percentage change of consumer price index	
Reserves/Months	Reserves expressed in terms of the number of months of imports of goods and services they could pay for [Reserves/(Imports/12)].	
Remittances/GDP	This variable comprises personal transfers and compensation of employees. Personal transfers consist of all current transfers in cash or in kind made or received by resident households to or from nonresident households. Compensation of employees refers to the income of border, seasonal, and other short-term workers who are employed in an economy where they are not resident and of residents employed by nonresident entities.	
Broad money/GDP	Sum of currency outside banks, demand deposits other than those of the central government, the time, savings, and foreign currency deposits of resident sectors other than the central government, bank and traveler's checks, and other securities such as certificates of deposit and commercial paper, % of GDP	
GDP growth	Annual percentage growth rate of GDP	
Investment profile	The risk to investment computed as the sum of contract viability/expropriation, profits repatriation, and payment delays. A higher value signals a lower risk.	ICRG database
Government stability	This is an assessment both of the government's ability to carry out its declared program(s), and its ability to stay in office.	
Corruption	This is an assessment of corruption within the political system. Such corruption is a threat to foreign investment for several reasons: it distorts the economic and financial environment; it reduces the efficiency of government and business by enabling people to assume positions of power through patronage rather than ability; and, last but not least, introduces an inherent instability into the political process.	
Internal conflict	Political violence and its actual or potential impact on governance. The highest (lowest) score signals no armed or civil opposition to the government and the government does not indulge in arbitrary violence, direct or indirect, against its own people (a country embroiled in an on-going civil war).	
Law and order	Composed of two elements that are assessed separately, namely law (the strength and impartiality of the legal system) and order (popular observance of the law). A higher value signals high degrees of law and/or order.	
Ethnic tensions	The degree of tension within a country attributable to racial, nationality, or language divisions. Higher values signal minimal tensions.	
Time length	It captures the time length since fiscal rule adoption	
Good time	Dummy equal 1 if the growth rate of GDP is above tit's mean value and 0 otherwise	Author construction
Strong stance	Dummy equal 1 if total external debt stocks (% of GDP) is above its mean value and 0 otherwise	
Macroeconomic instability	Standard deviation of output gap	

Table A3 : Sample of countries (all fiscal rules)

Control	Treated	Year of adoption
Belize	Argentina	2000
China	Brazil	2000
Domican Republic	Bulgaria	2003
Egypt	Chile	2001
El Salvador	Colombia	2000
Ghana	Ecuador	2003
Lebanon	Gabon	2002
Morocco	Hungary	2004
Philippines	Indonesia	1993
South Africa	Jamaica	2010
South Korea	Malaysia	1993
Tunisia	Mexico	2006
Turkey	Nigeria	2007
Ukraine	Pakistan	2005
Uruguay	Panama	2002
Venezuela	Peru	2000
Vietnam	Poland	1999
	Russia	2007
	Sri Lanka	2003
Total 17	Total 19	

Table A4 : BBR

Control	Treated	Year
Belize	Argentina	2000
Brazil	Bulgaria	2006
China	Chile	2001
Domican Republic	Colombia	2011
Egypt	Ecuador	2003
El Salvador	Gabon	2002
Ghana	Hungary	2004
Lebanon	Jamaica	2010
Morocco	Mexico	2006
Philippines	Nigeria	2007
South Africa	Pakistan	2005
South Korea	Panama	2002
Tunisia	Peru	2000
Turkey	Poland	2004
Ukraine	Russia	2007
Uruguay	Sri Lanka	2003
Venezuela	Indonesia	1993
Vietnam	Malaysia	1993
Total =18	18	

Table A5: DR

Control	Treated	Year
Argentina	Brazil	2000
Belize	Bulgaria	2003
Chile	Ecuador	2003
China	Gabon	2002
Colombia	Hungary	2004
Domican Republic	Indonesia	2004
Egypt	Jamaica	2010
El Salvador	Malaysia	1993
Ghana	Pakistan	2005
Lebanon	Panama	2002
Mexico	Poland	1999
Morocco	Sri Lanka	2003
Nigeria		
Peru		
Philippines		
Russia		
South Africa		
South Korea		
Tunisia		
Turkey		
Ukraine		
Uruguay		
Venezuela		
Vietnam		
Total =24	12	

Table A6 : ER

Control	Treated	Year
Belize	Argentina	2000
Chile	Brazil	2000
China	Bulgaria	2006
Domican Republic	Colombia	2000
Egypt	Ecuador	2010
El Salvador	Hungary	2010
Gabon	Mexico	2013
Ghana	Peru	2000
Indonesia	Poland	2011
Jamaica	Russia	2013
Lebanon		
Malaysia		
Morocco		
Nigeria		
Pakistan		
Panama		
Philippines		
South Africa		
South Korea		
Sri Lanka		
Tunisia		
Turkey		
Ukraine		
Uruguay		
Venezuela		
Vietnam		
Total =26	10	

Table A7 : BBR*DR

Control	Treated	Year
Argentina	Bulgaria	2006
Belize	Ecuador	2003
Brazil	Gabon	2002
Chile	Hungary	2004
China	Indonesia	2004
Colombia	Jamaica	2010
Domican Republic	Pakistan	2005
Egypt	Panama	2002
El Salvador	Poland	2004
Ghana	Sri Lanka	2003
Lebanon	Malaysia	1993
Mexico		
Morocco		
Nigeria		
Peru		
Philippines		
Russia		
South Africa		
South Korea		
Tunisia		
Turkey		
Ukraine		
Uruguay		
Venezuela		
Vietnam		
Total =25	11	

Table A8 : BBR*ER

Control	Treated	Year
Belize	Argentina	2000
Brazil	Bulgaria	2006
Chile	Colombia	2011
China	Hungary	2010
Domican Republic	Mexico	2013
Ecuador	Peru	2000
Egypt	Poland	2011
El Salvador		
Gabon		
Ghana		
Indonesia		
Jamaica		
Lebanon		
Malaysia		
Morocco		
Nigeria		
Pakistan		
Panama		
Philippines		
Russia		
South Africa		
South Korea		
Sri Lanka		
Tunisia		
Turkey		
Ukraine		
Uruguay		
Venezuela		
Vietnam		
Total =29	7	

Table A9 : DR*ER

Control	Treated	Year
Argentina	Brazil	2000
Belize	Bulgaria	2006
Chile	Hungary	2010
China	Poland	2011
Colombia		
Domican Republic		
Ecuador		
Egypt		
El Salvador		
Gabon		
Ghana		
Indonesia		
Jamaica		
Lebanon		
Malaysia		
Mexico		
Morocco		
Nigeria		
Pakistan		
Panama		
Peru		
Philippines		
Russia		
South Africa		
South Korea		
Sri Lanka		
Tunisia		
Turkey		
Ukraine		
Uruguay		
Venezuela		
Vietnam		
Total =32	4	

Table A10 : BBR*DR*ER

Control	Treated	Year
Argentina	Bulgaria	2006
Belize	Hungary	2010
Brazil	Poland	2011
Chile		
China		
Colombia		
Domican Republic		
Ecuador		
Egypt		
El Salvador		
Gabon		
Ghana		
Indonesia		
Jamaica		
Lebanon		
Malaysia		
Mexico		
Morocco		
Nigeria		
Pakistan		
Panama		
Peru		
Philippines		
Russia		
South Africa		
South Korea		
Sri Lanka		
Tunisia		
Turkey		
Ukraine		
Uruguay		
Venezuela		
Vietnam		
Total =33	3	

Table A11 : Exploring the heterogeneity

Sovereign rating	**[1]**	**[2]**	**[3]**	**[4]**	**[5]**	**[6]**	**[7]**	**[8]**	**[9]**	**[10]**	**[11]**	**[12]**	**[13]**	**[14]**	**[15]**
FR Dummy	0.759**	0.364	0.439	-0.745	0.317	1.487**	-0.0699	-1.111**	0.669	0.173	-0.473	0.157	-0.616	0.483	-0.990
	(0.338)	(0.368)	(0.392)	(0.470)	(0.562)	(0.678)	(0.406)	(0.462)	(0.521)	(0.517)	(0.411)	(0.478)	(0.472)	(0.382)	(4.152)
PSCORE		1.907***	2.375***	1.741**	1.936***	1.926**	1.904***	1.317*	1.736**	1.916**	1.442*	1.881**	1.641**	1.794**	0.739
		(0.721)	(0.784)	(0.707)	(0.723)	(0.753)	(0.720)	(0.698)	(0.701)	(0.742)	(0.760)	(0.810)	(0.648)	(0.714)	(0.746)
FR*PSM			-1.383												
			(1.706)												
FR*Time Length				0.224***											
				(0.0484)											
Macroeconomic Factors															
FR*Good/time					0.0368										
					(0.689)										
FR*Strong/stance						-1.619**									
						(0.752)									
FR*Macro/instability							0.0000527***								
							(0.0000136)								
FR*FDI/inflows								3.726***							
								(0.603)							
FR*government/size									-0.518						
									(0.652)						
FR*Secondary										0.429					
										(0.671)					
FR*trade											3.149***				
											(0.632)				
FR*Capital/openness												0.499			
												(0.679)			
FR*IT/conservative													0.784		
													(0.653)		
FR*CBI/irregular														0.314	
														(1.077)	
FR*Fix/regime															1.581
															(4.159)
Constant	10.20***	9.677***	9.547***	9.723***	9.487***	8.868***	9.992***	9.839***	9.055***	9.202***	9.701***	9.744***	9.215***	9.970***	7.799***
	(0.180)	(0.265)	(0.274)	(0.263)	(0.313)	(0.349)	(0.280)	(0.268)	(0.301)	(0.365)	(0.298)	(0.280)	(0.266)	(0.279)	(0.447)
N/R2	459/0.012	459/0.024	459/0.025	459/0.062	459/0.026	459/0.041	459/0.055	459/0.135	459/0.057	459/0.033	459/0.108	459/0.025	459/0.170	452/0.061	449/0.047

Note: Bootstrapped standard errors (with 500 replications) in brackets, * p < 0.10, ** p < 0.05, *** p < 0.01. Vector X variables in isolation (without interaction with FR) are included but not reported for the sake of space.

Table A12 : Exploring the heterogeneity cont.

Sovereign rating	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
FR Dummy	0.543	-0.360	-0.404	0.148	-1.911***	-0.157	-0.332	0.843*	0.337	0.497
	(0.527)	(0.557)	(0.473)	(0.434)	(0.544)	(0.379)	(0.485)	(0.451)	(0.417)	(0.374)
PSCORE	1.903***	2.054***	1.983***	1.769**	1.407**	2.327***	1.901***	1.806**	1.906***	1.601**
	(0.729)	(0.730)	(0.733)	(0.707)	(0.658)	(0.666)	(0.731)	(0.721)	(0.722)	(0.694)
Political Factors										
FR*Government/stability	-0.00651									
	(0.687)									
FR*external/conflict		1.293*								
		(0.676)								
FR*internal/conflict			1.782***							
			(0.642)							
FR*corruption				0.624						
				(0.710)						
FR*investment/profile					3.421***					
					(0.636)					
FR*law/order						2.433***				
						(0.579)				
FR*ethnic/tensions							1.640**			
							(0.710)			
Design										
FR*Enforcement								-0.939		
								(0.572)		
FR*Monitoring									0.0580	
									(0.583)	
FR*Fiscal/Council										-1.988***
										(0.767)
Constant	9.228***	9.697***	9.127***	9.680***	9.129***	8.430***	9.793***	9.705***	9.677***	9.452***
	(0.344)	(0.364)	(0.316)	(0.304)	(0.351)	(0.281)	(0.378)	(0.266)	(0.265)	(0.261)
N/ R2	459/0.034	459/0.035	459/0.092	459/0.028	459/0.203	459/0.248	459/0.041	459/0.031	459/0.024	459/0.116

Note: Bootstrapped standard errors (with 500 replications) in brackets, * p < 0.10, ** p < 0.05, *** p < 0.01. Vector X variables in isolation (without interaction with FR) are included but not reported for the sake of space.

Supplementary robustness checks

TABLE A13 :

Treatment Variable	1-Nearest Neighbour Matching	2-Nearest Neighbour Matching	3-Nearest Neighbour Matching	Radius Matching			Local Linear Regression Matching	Kernel Matching
FR Dummy				**r=0.005**	**r=0.01**	**r=0.05**		
DEPENDENT VARIABLE: LOG (EMBIG)								
ATT	**-0.185**	**-0.174**	**-0.222***	**-0.198**	**-0.203***	**-0.247****	**-0.265*****	**-0.239****
Dropping 2009	**(0.142)**	**(0.137)**	**(0.116)**	**(0.141)**	**(0.114)**	**(0.0965)**	**(0.0913)**	**(0.101)**
Treated/Control/Total obs.	161/291/452	161/291/452	161/291/452	161/291/452	161/291/452	161/291/452	161/291/452	161/291/452
Rosenbaum bounds sensitivity	1.2	1.2	1.4	1.2	1.4	1.6	1.7	1.6
Standardized biases (p-value)	0.25	0.93	0.97	0.89	0.98	0.96	0.25	0.97
Pseudo R2	0.026	0.008	0.006	0.012	0.006	0.006	0.026	0.005
ATT	**-0.232***	**-0.288****	**-0.268****	**-0.290****	**-0.310*****	**-0.210****	**-0.239*****	**-0.220****
Dropping Ex USSR	**(0.140)**	**(0.122)**	**(0.106)**	**(0.136)**	**(0.114)**	**(0.0939)**	**(0.0879)**	**(0.0944)**
Treated/Control/Total obs.	173/281/454	173/281/454	173/281/454	173/281/454	173/281/454	173/281/454	173/281/454	173/281/454
Rosenbaum bounds sensitivity	1.3	1.6	1.6	1.5	1.7	1.5	1.6	1.5
Standardized biases (p-value)	0.83	0.810	0.910	0.79	0.64	0.96	0.83	0.96
Pseudo R2	0.010	0.011	0.009	0.010	0.015	0.006	0.010	0.006
ATT	**-0.159**	**-0.185**	**-0.253****	**-0.182**	**-0.222****	**-0.227****	**-0.251*****	**-0.225****
Dropping High debt	**(0.142)**	**(0.126)**	**(0.125)**	**(0.131)**	**(0.113)**	**(0.0917)**	**(0.0932)**	**(0.0927)**
Treated/Control/Total obs.	155/303/458	155/303/458	155/303/458	155/303/458	155/303/458	155/303/458	155/303/458	155/303/458
Rosenbaum bounds sensitivity	1.1	1.3	1.5	1.2	1.4	1.5	1.7	1.5
Standardized biases (p-value)	0.51	0.974	0.804	0.76	0.81	0.98	0.51	0.98
Pseudo R2	0.019	0.006	0.012	0.016	0.013	0.005	0.019	0.005
ATT	**-0.225***	**-0.247****	**-0.229****	**-0.241***	**-0.212***	**-0.224*****	**-0.241*****	**-0.218****
Dropping Hyperinflation	**(0.130)**	**(0.117)**	**(0.112)**	**(0.136)**	**(0.119)**	**(0.0862)**	**(0.0875)**	**(0.0936)**
Treated/Control/Total obs.	175/286/461	175/286/461	175/286/461	175/286/461	175/286/461	175/286/461	175/286/461	175/286/461
Rosenbaum bounds sensitivity	1.3	1.5	1.5	1.5	1.4	1.6	1.7	1.5
Standardized biases (p-value)	0.24	0.769	0.860	0.83	0.93	0.98	0.24	0.98
Pseudo R2	0.024	0.012	0.010	0.012	0.008	0.005	0.024	0.005
ATT	**-0.264****	**-0.229***	**-0.241****	**-0.235***	**-0.211***	**-0.224****	**-0.243*****	**-0.218****
Dropping Monetary Unions	**(0.133)**	**(0.122)**	**(0.113)**	**(0.139)**	**(0.111)**	**(0.0938)**	**(0.0792)**	**(0.0933)**
Treated/Control/Total obs.	175/308/483	175/308/483	175/308/483	175/308/483	175/308/483	175/308/483	175/308/483	175/308/483
Rosenbaum bounds sensitivity	1.4	1.4	1.5	1.4	1.4	1.6	1.7	1.5
Standardized biases (p-value)	0.31	0.866	0.846	0.83	0.93	0.98	0.31	0.98
Pseudo R2	0.022	0.014	0.010	0.012	0.008	0.005	0.022	0.005

Note: Bootstrapped standard errors (with 500 replications) in brackets, * p < 0.10, ** p < 0.05, *** p < 0.01

TABLE A14 :

Treatment Variable FR Dummy	1-Nearest Neighbour Matching	2-Nearest Neighbour Matching	3-Nearest Neighbour Matching	Radius Matching r=0.005	Radius Matching r=0.01	Radius Matching r=0.05	Local Linear Regression Matching	Kernel Matching
DEPENDENT VARIABLE: SOVEREIGN DEBT RATINGS								
ATT	**0.636**	**0.839***	**0.777***	**1.128****	**0.980****	**0.776****	**0.811****	**0.804****
Dropping 2009	**(0.504)**	**(0.467)**	**(0.440)**	**(0.480)**	**(0.409)**	**(0.339)**	**(0.350)**	**(0.350)**
Treated/Control/Total obs.	179/344/523	179/344/523	179/344/523	179/344/523	179/344/523	179/344/523	179/344/523	179/344/523
Rosenbaum bounds sensitivity	1.2	1.4	1.3	1.6	1.5	1.4	1.4	1.4
Standardized biases (p-value)	0.36	0.32	0.70	0.80	0.98	0.99	0.36	0.99
Pseudo R2	0.020	0.021	0.013	0.013	0.005	0.003	0.020	0.003
ATT	**0.572**	**0.790***	**0.840****	**0.835***	**0.864****	**0.862****	**0.895*****	**0.881*****
Dropping Ex USSR	**(0.464)**	**(0.406)**	**(0.395)**	**(0.496)**	**(0.418)**	**(0.339)**	**(0.332)**	**(0.341)**
Treated/Control/Total obs.	192/332/524	192/332/524	192/332/524	192/332/524	192/332/524	192/332/524	192/332/524	192/332/524
Rosenbaum bounds sensitivity	1.2	1.3	1.4	1.3	1.4	1.4	1.4	1.4
Standardized biases (p-value)	0.10	0.606	0.773	0.60	0.83	0.97	0.10	0.98
Pseudo R2	0.028	0.014	0.011	0.017	0.010	0.005	0.028	0.004
ATT	**0.674**	**0.775***	**0.796***	**0.729**	**0.717***	**0.851*****	**0.919*****	**0.875****
Dropping High debt	**(0.464)**	**(0.445)**	**(0.427)**	**(0.468)**	**(0.394)**	**(0.327)**	**(0.318)**	**(0.355)**
Treated/Control/Total obs.	173/357/530	173/357/530	173/357/530	173/357/530	173/357/530	173/357/530	173/357/530	173/357/530
Rosenbaum bounds sensitivity	1.2	1.3	1.3	1.2	1.3	1.4	1.5	1.4
Standardized biases (p-value)	0.81	0.999	0.981	96	0.91	0.99	0.81	0.99
Pseudo R2	0.010	0.003	0.005	0.007	0.008	0.002	0.010	0.002
ATT	**1.336*****	**1.113****	**0.997****	**1.118****	**0.831***	**0.922*****	**0.914*****	**0.918*****
Dropping Hyperinflation	**(0.469)**	**(0.438)**	**(0.416)**	**(0.459)**	**(0.434)**	**(0.354)**	**(0.307)**	**(0.347)**
Treated/Control/Total obs.	193/338/531	193/338/531	193/338/531	193/338/531	193/338/531	193/338/531	193/338/531	193/338/531
Rosenbaum bounds sensitivity	1.7	1.6	1.5	1.5	1.4	1.5	1.5	1.5
Standardized biases (p-value)	0.66	0.844	0.903	0.74	0.96	0.98	0.66	0.98
Pseudo R2	0.013	0.009	0.008	0.013	0.006	0.004	0.013	0.004
ATT	**1.141****	**0.973****	**0.953****	**0.971****	**1.231*****	**0.879*****	**0.891*****	**0.888*****
Dropping Monetary Unions	**(0.468)**	**(0.421)**	**(0.419)**	**(0.455)**	**(0.374)**	**(0.308)**	**(0.318)**	**(0.333)**
Treated/Control/Total obs.	194/362/556	194/362/556	194/362/556	194/362/556	194/362/556	194/362/556	194/362/556	194/362/556
Rosenbaum bounds sensitivity	1.4	1.5	1.4	1.4	1.6	1.4	1.5	1.5
Standardized biases (p-value)	0.82	0.836	0.732	0.92	0.80	0.98	0.82	0.99
Pseudo R2	0.009	0.010	0.012	0.008	0.010	0.004	0.009	0.003

Standard errors in parentheses * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$