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The impact of fiscal rules on sovereign risk premia: international evidence

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Abstract

We examine whether adopting a numerical fiscal rule framework to guide fiscal policy helps reduce sovereign risk premia in a sample of advanced and developing countries for 1985-2012. We address the self-selection problem of policy adoption by applying propensity score matching methods. The results suggest that adopting fiscal rules reduces sovereign risk premia.

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Key words: Sovereign risk, fiscal rules, propensity score matching

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I. Introduction

There is a large literature on the merits of different policy regimes as credibility enhancers. The focus of attention was initially on the best choice of exchange rate regime (see Edwards (2001) for a survey), but from the mid 1990s this shifted first to the benefits of adopting inflation targeting (IT) and, later, to adopting fiscal rules (FRs). One way to measure credibility changes is through developments in sovereign risk premia. For example, Thornton and Vasilakis (2016) and Fouejie and Roger (2013) demonstrate that IT adoption resulted in lower sovereign risk premia in IT-adopting countries compared to countries with other monetary regimes. In this short paper, we show that this conclusion also holds for FRs adoption—i.e., sovereign risk premia are lower in countries that adopt FRs compared to those that do not.

Numerical FRs have been a popular addition to fiscal frameworks since the early 1990s.[1] The increased use reflects concerns about a so-called fiscal 'deficit bias' that results from governments' shortsightedness and the 'common pool' problem (Wyplosz, 2013). One way to mitigate the deficit bias is to adopt numerical fiscal rules that impose binding constraints on the conduct of fiscal policy, thereby safeguarding public debt sustainability and helping to build policy credibility (Kopits and Symansky, 1998). In addition, investors might perceive the adoption of a rule-based fiscal framework as a signal of a broader commitment to sounder macroeconomic policies and institutional reforms. If the adoption of FRs has these effects then, ceteris paribus, the adoption of FRs might be expected to result in a reduction in the risk premia paid to compensate lenders for the possibility of government default. This is the issue that we address in this paper. Specifically, we

examine whether the adoption of FRs-based policy frameworks (compared to other fiscal frameworks) has reduced sovereign risk premia in the countries that adopted them. In practice, countries adopting FRs have typically opted for rules that are linked closely to debt sustainability, with the most common rules specifying some measure of budget balance, and an explicit limit on or target for public debt. We focus on the impact of these two rules on sovereign risk premia in a sample of 67 advanced and developing economies over the period 1985-2012, 39 of which adopted one or both such FRs. Our results suggest that adoption of FRs reduces sovereign risk premia by between 1.1-1.8 per cent of the international borrowing spread (depending on the type of rule adopted) in FRs adopting countries relative to that for countries with other fiscal regimes.

Empirical evidence on the impact of FRs on sovereign risk premia is limited and mixed, and it relates almost exclusively to the experience of the U.S. states and some European Union (EU) countries. For the U.S., this evidence includes Eichengreen and Bayoumi (1994) and Bayoumi et al. (1995), who report that constitutional restraints to borrowing reduce the costs of borrowing by US states; Poterba and Rueben (1999), who find that rules on U.S. states' expenditure, deficits, and debt reduce their borrowing costs except when a state also imposes limitations on the ability to raise taxes; Poterba and Rueben (2001), who find that a sudden increase in the fiscal deficit raises state financing costs, but that the rise is smaller if states have strict FRs; and Johnson and Kriz (2005), who find that numerical FRs reduce borrowing costs but that the effect operates indirectly by improving credit ratings. For European countries, the evidence includes Iara and Wolf (2014), who report that FRs only impact on borrowing costs of euro area countries at times of market stress; Heinemann, et al.

(2014), who find that the impact of FRs on euro area countries is less important once historical fiscal preferences are taken into account; and Feld et al. (2012), who find a robust negative effect of FRs on bond spreads for Swiss cantons. One issue with the approach taken in these studies is that they typically search for FRs effects by incorporating a fiscal rule adoption dummy in a cross-state or cross-country samples and examine the statistical significance and sign of the coefficient on the dummy. A problem with this approach is that it ignores the self-selection problem of policy adoption and as such can lead to biased estimates when a country's policy choice is nonrandom. We address the self-selection problem by evaluating the treatment effect of FRs adoption on sovereign risk premia making use of propensity score-matching methods developed in the treatment effect literature.

2. Methodology and data

We test the impact of FRs adoption on sovereign risk premia by examining developments in the spread between the interest rate at which a country borrows and the "risk free" rate, which we define as the yield on long-term U.S. Treasury bonds We have two treatment groups—one group of 33 advanced and developing countries that had adopted a numerical rule on the fiscal balance by the end of 2012, and a second group of 27 advanced and developing countries that had adopted a rule on the stock of public debt (with overlap between the two groups as many countries adopted both rules). We draw on IMF (2009) and Schaechter et al. (2012) for a listing of countries that have adopted numerical FRs and the dates of adoption. The control group comprises 29 non-FRs adopting countries. The treatment and control groups are listed in Table 1. Data on long-term sovereign bond yields are from the IMF's

International Financial Statistics database and from Bloomberg and refer in most cases to government bonds of 10-year maturity. Figure 1 illustrates average sovereign risk premia for countries that did and did not adopt an FRs framework during 1985-2012. The impression is of somewhat higher risk premia in non-FRs countries, at least since the mid-1990s.

We make use of four propensity score matching methods to address the self-selection problem that have been applied recently to evaluations of macroeconomic policy (e.g., Glick et al. 2006, Lin and Ye 2007, 2009, 2013). The first method is nearest-neighbour matching with replacement, which matches each treated country to the n control countries that have the closest propensity scores. We use two nearest-neighbour matching estimators: n = 1 and n = 3. The second method is radius matching, which performs the matching based on estimated propensity scores falling with a certain radius r. We use a wide radius (r=0.05), a medium radius (r=0.03), and a tight radius (r=0.01). The third method is the kernel matching method, which matches a treated group country to all control group countries weighted in proportion to the closeness between the treated group country and the control group country. The final method is the regression adjusted local linear matching method.

3. Estimating the average treatment effects

We first use the following probit model to estimate the propensity scores, which are the probabilities of adopting an FRs framework conditional on a group of control variables:

$$P(Y_{it} = 1|X_{it}) = \Phi(X'_{it}\beta) + \eta_{it} \qquad (1)$$

where Y_{it} is a dummy variable for the adoption of an FRs regime, X_{it} is a set of control variables, Φ is the cumulative function of the standard normal distribution, and η_{it} is the error term. We then utilize the estimated propensity scores to conduct matching to obtain the treatment effects of FRs adoption (compared to those of non-FRs adoption). For the control variables, we draw on Altunbaş and Thornton's (2015) analysis of the determinants of a country's decision to adopt an FRs regime, which suggests that the probability of a country doing so is greater if it has a high level of public debt, if economic conditions are relatively stable, if it is relatively open to international trade and its exchange rate regime is relatively inflexible, if it is decentralized fiscally, if the monetary framework embraces inflation targeting, and if the country is a member of a currency union. Accordingly, we include in our baseline probit estimation: the ratio of public debt to GDP; the rate of inflation, the rate of real GDP growth, real GDP per capita; the relative flexibility of the exchange rate regime; openness to international trade (exports plus imports as a per cent of GDP); and three 0-1 dummy variables to indicate whether a country is a federation, has adopted an inflation targeting regime, and is a member of a currency union. We draw on Mauro et al. (2013) and the IMF's World Economic Outlook (WEO) database for data on annual fiscal balances, and on Abbas et al. (2010) and the WEO database for data on public debt. Our macroeconomic variables are from the World Bank's World Development Indicators database. In addition, we have drawn on the Reinhart and Rogoff (2004) coarse grid exchange rate regime classification that ranges from 1 (least flexible) to 5 (most flexible); on Hammond (2012) for information on inflation targeting adoption, and the CIA Factbook for information on whether countries have

federal or unitary fiscal systems.

4. Results

The probit results are reported in Table 2. The baseline results (column 1 for the balance rule and 3 for the debt rule) are broadly as expected: the probability of a country adopting a numerical rule on the fiscal balance or the stock of public debt is greater if the stock of public debt, GDP growth, and GDP per capita are relatively high, the economy is relatively open, if an inflation targeting regime is in place, if it is a member of a currency union, if it is a federation, if the exchange rate regime is relatively inflexible, and if inflation is relatively low. To ensure that the treatment group and the control group are reasonably comparable, we sort the observations by their estimated propensity scores and discard the control group countries whose estimated propensity scores are lower than the lowest score among the treated group countries. The matching results based on the new sample are presented in Table 3, which reports the estimated average treatment effect on the treated (ATTs) for sovereign risk premia for the fiscal balance rule and the public debt rule. The ATTs are negative, statistically significant, and quite large in magnitude. The risk premia narrows by an average of between 1.5-1.8 per cent for the fiscal balance rule (row 1), and between 1.1-1.2 per cent for a rule on the public debt (row 3).

As a robustness check, we take account of the fact that many countries in our sample received debt reduction over the sample period either as a result of multilateral debt relief initiatives or as the outcome of bilateral negotiations with official and private creditors. For some countries the debt reduction was very large—for example,

accumulating in current US dollars to the equivalent of over 100% of 2012 GDP.[3] Debt reduction influences not only the recipient country's debt stock but also its fiscal balance because of the associated reduction in interest payments and would likely bias our baseline results. Probit results including debt reduction are reported in columns 2 and 4 of Table 2. The coefficient on debt reduction is statistically significant and negative, indicating that countries that experience debt relief were less likely to adopt a rule. The associated matching results in these cases are reported in rows 2 and 4 of Table 3: the estimated ATTs remain negative, statistically significant, and of a similar magnitude. As such, we conclude that the adoption of FRs has a significant impact in reducing sovereign risk premia after controlling for debt reduction.

5. Conclusions

In this paper, we evaluated the treatment effect of adopting numerical FRs on sovereign risk premia in a sample of advanced and developing economies. We used different propensity score matching methods to show that the adoption of FRs on the fiscal balance and/or the stock of public debt resulted in a statistically significant reduction in sovereign risk premia—on average between 1.1-1.8 per cent of the annual yield spread. The results suggest that FRs help build policy credibility, which reduces the risk premia paid to compensate lenders for the possibility of government default.

Footnotes

1. For example, IMF (2009) estimates that by the end of 2009, 80 countries had adopted national and supranational numerical fiscal rules to guide fiscal policy.

2. The number of countries included in the treatment and control groups is constrained by the limited availability of long runs of international bond yield data.

3. For example, of the countries in our sample, Ethiopia, Guyana, Liberia, Madagascar, Mozambique, Nicaragua, Sierra Leone, São Tomé and Principe, and Zambia all received debt reduction to the equivalent of over 100% of 2010 GDP during 1985-2012.

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Table 1
Treatment and control groups for sovereign risk premia

1. *Fiscal balance rule treatment group (adoption year)*
Argentina (2000), Australia (1998), Austria (1999), Belgium (1992), Bulgaria (2007), Canada (1998), Denmark (1992), Estonia (1993), Finland (1995), France (1992), Germany (1985), Greece (1992), Hungary (2004), India (2004), Indonesia (1985), Ireland (1992), Israel (1992), Italy (1992), Latvia (2004), Malta (2004), Mexico (2006), Netherlands (1992), Norway (2001), Pakistan (2005), Peru (2000), Poland (2004), Portugal (1992), Romania (2007), Slovak Republic (2004), Slovenia (2001), Spain (1992), Sweden (1995), United Kingdom (1997).

2. *Public debt rule treatment group (adoption year)*
Armenia (2008), Australia (1998), Austria (1995), Belgium (1992), Denmark (1992), Estonia (2004), France (1992), Germany (1992), Greece (1992), Hungary (2005), India (2012), Indonesia (2004), Ireland (1992), Italy (1992), Lithuania (1997), Malta (2004), Namibia (2001), Netherlands (1992), Pakistan (2005), Poland (1999), Portugal (1992), Romania (2007), Slovak Republic (2004), Slovenia (2000), Spain (1992), Sweden (1995), United Kingdom (1992).

3. *Common control group (no fiscal rule)*
Botswana, Burundi, Chile, China, Colombia, Egypt, Ethiopia, Fiji, Ghana, Iceland, Japan, Jordan, Kazakhstan, Korea, Malaysia, Moldova, Morocco, Nepal, Papua New Guinea, Philippines, Russia, Seychelles, Singapore, Sierra Leone, South Africa, Thailand, Turkey, United States, Venezuela

Notes: Germany and Indonesia had fiscal rules for public debt in place prior to the start of the sample period (1985).

Table 2
Probit estimates of propensity scores for adopting numerical fiscal rules

	1	2	3	4
Lagged public debt	0.0035**	0.0009*	0.0014*	0.0005
	(0.0007)	(0.0005)	(0.0007)	(0.0008)
Inflation	-0.0285***	-0.0341***	-0.0363***	-0.0418***
	(0.0059)	(0.0090)	(0.0055)	(0.0008)
GDP growth	0.0017	0.0003	0.0018	0.0129
	(0.0064)	(0.0077)	(0.0061)	(0.0076)
GDP per capita	0.0941***	0.0860***	0.1267***	0.1138***
	(0.0197)	(0.0235)	(0.0213)	(0.0252)
Trade to GDP	-0.0005	-0.0019**	-0.0022**	-0.0034**
	(0.0007)	(0.0009)	(0.0008)	(0.0010)
Exchange rate regime	-0.2486***	-0.2616***	-0.4311***	-0.4717***
	(0.0399)	(0.0492)	(0.0496)	(0.0569)
Inflation targeter	0.9945***	1.0270***	0.8525***	0.9108***
	(0.0990)	(0.1160)	(0.1122)	(0.1323)
Currency union member	0.8465***	0.8469***	1.2038***	1.1869***
	(0.0630)	(0.0728)	(0.0659)	(0.0801)
Federation	0.5542***	0.4449***	0.6791***	0.7719***
	(0.0872)	(0.0991)	(0.1044)	(0.1200)
Public debt reduction		-0.0214***		-0.0170*
		(0.0077)		(0.0101)
Psuedo R^2	0.245	0.249	0.347	0.348
Observations	3,399	2,558	3,417	2,515

Notes. Constant terms are included but not reported. Robust standard errors in parenthesis.
***, ** and * indicate statistical significance at the levels of 1%, 5%, and 10%.