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Sudden Stops, Sovereign Risk and Fiscal Rules*

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Abstract

This paper studies the effect of implementing fiscal rules on sovereign default risk and on the probability of large capital flow reversals for a large sample of countries including both developed and emerging market economies. Results indicate that fis-cal rules are beneficial for macroeconomic stability, as they significantly reduce both sovereign risk perception and the probability of a sudden stop in countries that imple-ment them. These results, which are robust to various empirical specifications, have important policy implications specially for countries that have relaxed their fiscal rules in response to the Covid-19 pandemic.

JEL Classification: C33; F34; G15

Keywords: fiscal rules, sovereign default risk, sudden stops, dynamic heterogeneous panel data models

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1 Introduction

Since the beginning of the 1990s, rules-based macroeconomic policies have gained increasing importance worldwide. For instance, while in 1990 only one central bank was an inflation targetter (New Zealand), 27 central banks had fully fledged inflation targeting regimes at the beginning of 2012 according to the Bank of England's Centre for Central Banking Studies. Importantly, the six largest Latin American economies (Argentina, Brazil, Colombia, Chile, Mexico, and Peru) have implemented ruled-based inflation targeting regimes during the last two decades. A similar pattern has been observed in the fiscal area: an increasing number of countries have adopted rules for conducting fiscal policies, with the idea of achieving medium- and long-term balanced budgets which are difficult to guarantee under discretionary policies.

While different arrangements coexist, the main objective of fiscal rule implementations is the same: they procure to confer credibility on the conduct of fiscal (and, more in general, macroeconomic) policies by removing discretionary intervention (Kopits, 2001). The central idea is that a country's macroeconomic fundamentals remain solid and stable regardless of the government in charge. While fiscal discipline has been highly regarded since long ago, under certain circumstances governments may have incentives to overspend creating large public budget misalignments. For instance, governments can see active public spending as a way of counteracting large private spending shortages during periods of economic depression, or as a way of reducing the intensity of business cycles driven by the fluctuation of commodity prices in commodity-dependent emerging market economies (see, for instance, Pieschacon, 2012). There is a growing consensus that the large increase observed in developed countries' private debt is due to a spending bias of politicians which distorts democratic budgetary decision making (Imbeau, 2004). Under these (and other) circumstances, fiscal rules can act as important anchors for long-run fiscal sustainability. Hence, fiscal rules typically aim at correcting distorted incentives and containing pressures to overspend as to ensure fiscal responsibility and debt sustainability.

Currently, different types of fiscal rules coexist. According to the IMF, they can be broadly separated into four categories: budget balance rules, debt rules, expenditure rules, and revenue rules. In each case, rules can apply either to the central government or the public sector. Currently, at least 96 countries around the world have implemented fiscal rules (see IMF, 2017). Differences exist in the way in which these rules are implemented, for example in their legal bases and the escape clauses that are established for special circumstances. In fact, escape clauses have been actively used by various countries in order to allow an active response of governments to the Covid-19 pandemic.

Recently, a large body of literature on the effectiveness of fiscal rules has emerged. Most studies show that the implementation of numerical fiscal rules has been effective in achieving fiscal sustainability (e.g., Schaltegger and Feld, 2009; Argimon and Hernandez de Cos, 2012; Tapsoba, 2012; Benito et al., 2013; Dahan and Strawczynski, 2013; Neyapti, 2013). However, some studies have argued that these results may be biased due to endogeneity issues, as the fact that a country has a fiscal rule in place might reflect its preferences for fiscal discipline (Poterba, 1996; Debrun et al., 2008). A recent meta-analysis of studies on the effect of fiscal rules on fiscal consolidation shows that the effect is positive but may be quantitatively smaller than what has been suggested by previous studies, due to potential endogeneity and publication bias (Heinemann et al., 2018).

However, most studies suggest that fiscal rules are beneficial for long-term fiscal sustainability, a building block on which macroeconomic stability is built. Therefore, the implementation of fiscal rules has gained importance in the toolkit of macroeconomic stabilization policies. An important ongoing research question deals with the effect of fiscal rules on overall macroeconomic stability. A relevant question deals with the effect of fiscal rules on sovereign default risk. If fiscal rules are useful in stabilizing government budget deficits, then they should contribute to the reduction of sovereign default risk. Paradoxically, the literature on sovereign risk has largely ignored the role of fiscal rules (see, for instance, Aizenman et al., 2013; Beirne and Fratzscher, 2013; Banerji et al., 2014; Augustin and Todongap, 2016; Ordonez-Callamand et al., 2017). Similarly, the sudden stops literature, closely related to the sovereign risk literature, has also ignored the potentially beneficial effect of fiscal rules adoption on the probability of occurrence of a sudden stop (see, for instance, Cavallo et al., 2017; Cavallo, 2019).

This paper fills this gap in the literature, studying the effect of fiscal rule implementations on sovereign risk and on the probability of a sudden stop. Two different but complementary empirical models are used. To evaluate the probability of a sudden stop, this study follows closely recent papers on the determinants of sudden stops adding the presence or absence of fiscal rules in the setup of a probabilistic regression model. The closest papers in this literature, i.e., Cavallo et al. (2017), Cavallo (2019) and Cavallo et al. (2020), identify the main factors determining sudden stop prevention in net inflows in a probabilistic setup. They conclude that favorable local conditions influence investors' risk perception protecting the country from this shock. We build on their findings by focusing on the incidence of putting in place and maintaining a fiscal institution such as a fiscal rule in the international perception of risk. Our results show that fiscal rule implementations are beneficial to macroeconomic stability in that they significantly reduce the probability of a sudden capital flow reversal. This result holds for various alternative empirical specifications, showing the robustness of this effect.

We also evaluate the effect of the implementation of a fiscal rule on sovereign default risk, measured by the difference between the return of a public bond of a given maturity of a country with respect to the return of a treasury of the same maturity of the United States in secondary bond markets. This approach to measuring sovereign risk has been followed by several papers, including Hilscher and Nosbusch (2010), Eichler and Maltritz (2013), and Ojeda-Joya and Gomez-Gonzalez (2014). Some recent studies have suggested that results form this studies may be biased due to endogeneity issues (see, for instance, Ordonez-Callamand et al., 2017). To control for potential endogeneity, we use the models of Pesaran (2006), Chudik and Pesaran (2015), and Westerlund et al. (2017). These models allow the inclusion of weakly exogenous regressors and account for potential cross-sectional dependence between panels. Cross-sectional dependence is frequently encountered when cross-sectional units correspond to countries or other large individuals.

Results from these models indicate that fiscal rule implementations significantly reduce sovereign risk. The implementation of a fiscal rule leads to a reduction of government bond interest rate spreads (with respect to US treasuries), which are larger for emerging market economies.

The second section is methodological. It briefly describes the econometric models used in this paper. The third section describes the data used in the empirical analysis. The fourth section presents estimation results, and the last section concludes.

2 Methodology

This section describes the methodology used in this paper. It is divided into two subsections. The first briefly describes the model used for studying the impact of fiscal rules on the probability of a sudden stop. The second presents the model used for estimating the effect of fiscal rule implementations on sovereign default risk.

For estimating the effect of implementing a fiscal rule on a country's probability of facing a sudden stop we use a traditional Probit model, following the previous literature (Cavallo, 2017). Regarding the effect of fiscal rules on sovereign default risk, we implement two novel panel data models that allow the incorporation of common factors and country heterogeneity in a dynamic setting (Chudik Pesaran, 2015), as well as testing for predictability (Westerlund et al., 2017). Both methods produce consistent estimators even if violations of strict exogeneity occur. This is an important advantage in our context as interest rate spreads may influence some frequently included determinants (see Cubillos-Rocha et al., 2017). Additionally, both methods account for cross-sectional dependence, a common feature in cross-country studies.

2.1 Model for computing the effect of fiscal rules on the probability of a sudden stop

We use a bivariate Probit model for studying the effect of implementing a fiscal rule on the probability that a country experiences a sudden capital reversion.

Let Y_i^0 represent overall macroeconomic stability of country i. This is a latent, unobservable variable. Suppose the latent variable is a linear function of various observed exogenous variables, $x_{i,1}, x_{i,2}, ...x_{i,k}$ for some $k \in \mathbb{N}$. Hence,

$$Y_i^0 = \beta_1 x_{i,1} + \beta_2 x_{i,2} + ... + \beta_k x_{i,k} + \epsilon_i \tag{1}$$

for $i = 1, ..., n$ (a sample of n countries). Here $\beta = (\beta_1, ...\beta_k)$ is a vector of unknown parameters to be estimated using the data, and ϵ_i is a Standard Normal random variable.

Note that Y_i^0 were directly observable, Equation (1) could be estimated running ordinary least squares (OLS) regression. However, this is a latent variable and with some further assumptions we can obtain estimates of the unknown parameters in β. Suppose there is an observed variable Y_i (in our case, the occurrence or not of a sudden stop) such that

$$Y_i = \begin{cases} 1, & \text{if } Y_i^0 > \delta \\ 0, & \text{otherwise} \end{cases}$$

where δ is a parameter. Note that the expected (conditional) value of Y_i is given by

$$E(Y_i \mid \Omega_i) = 1\,\Pr(Y_i = 1 \mid \Omega_i) + 0\,\Pr(Y_i = 0 \mid \Omega_i) = \Pr(Y_i = 1 \mid \Omega_i) = P_i \tag{2}$$

Equation (2) shows that a model for the probability P_i is a model of the expected value of Y_i. Note that

$$P_i = \Pr(Y_i = 1 \mid \Omega_i) = Pr(Y_i^0 < \delta \mid \Omega_i) = \Pr(\beta_1 x_{i,1} + \beta_2 x_{i,2} + ... + \beta_k x_{i,k} + \epsilon_i < \delta) \tag{3}$$

Therefore,

$$P_i = \Pr(\epsilon_i < \delta - (\beta_1 x_{i,1} + \beta_2 x_{i,2} + ... + \beta_k x_{i,k})) = \Phi(delta - (\beta_1 x_{i,1} + \beta_2 x_{i,2} + ... + \beta_k x_{i,k})) \tag{4}$$

where $\Phi()$ represents the cumulative density function of the Standard Normal distribution. We are interested in estimating the parameters $\beta_1, \beta_2, ...\beta_k, \delta$ and evaluate the marginal effects of each exogenous variable on the dependent variable. Estimation can be performed by the method of Maximum Likelihood, by maximizing the log-Likelihood function on the unknown parameters. Marginal effects can then be computed using the following formula:

$$\frac{\partial P_i}{x_{i,j}} = \phi(delta - (\beta_1 x_{i,1} + \beta_2 x_{i,2} + ... + \beta_k x_{i,k}))\beta_j, \text{for } j = 1, ...n, \text{and } i = 1, ...n \tag{5}$$

Note that $\phi()$ denotes the Standard Normal density function. Estimated marginal effects can be computed for observed variables and their interactions. In our study, we are particularly interested in the effect of the implementation of fiscal rules and its interaction with some country-specific characteristics on macroeconomic stability and on the probability of a sudden capital reversion.

2.2 Model for estimating the effect of fiscal rules implementation on sovereign risk

Estimation and inference in large heterogenous panels has been widely studied in the field. One of the seminal papers on this topic is Pesaran (2006). In this paper heterogeneity is treated using cross-sectional averages to filter individual-specific regressors, in short a common factor model. One of the advantages of this approach is that it is robust to possible unit roots in factors and to slope heterogeneity. However, this estimator does not allow lagged dependent variables or weakly exogenous regressors. Chudik and Pesaran (2015) proposed an estimator based on Pesaran (2006) which allows for these two features. The model can be written as

$$\begin{aligned} y_{it} &= c_{yi} + \phi_i y_{i,t-1} + \beta_{0i}' \mathbf{x}_{it} + \beta_{1i}' \mathbf{x}_{i,t-1} + u_{it} \\ u_{it} &= \gamma' \mathbf{f}_t + \epsilon_{it} \\ \omega_{it} \equiv \begin{pmatrix} \mathbf{x}_{it} \\ \mathbf{g}_{it} \end{pmatrix} &= \mathbf{c}_{\omega i} + \alpha_i y_{i,t-1} + \mathbf{\Gamma}_i' \mathbf{f}_t + \mathbf{v}_{it}, \end{aligned} \tag{6}$$

for $i \in \{1, ..., N\}$, $t \in \{1..., T\}$. Where, $\mathbf{x}_{it}$ is a k_x-column vector of regressors; $\mathbf{g}_{it}$[1] is a k_g-column vector of covariates specific to unit i; $\mathbf{f}_t$ is an m-column vector of unobserved common factors; ϵ_{it} represents the idiosyncratic errors; and, $\mathbf{\Gamma}_i$ is a $m \times (k_x + k_g)$ matrix of factor loadings. Moreover, the vector of coefficients $\pi_i \equiv (\phi_i, \beta_{0i}', \beta_{1i}')'$ and the factor loadings, γ_i and Γ_i, are assumed to follow random coefficient models

$$\begin{aligned} \gamma_i &= \gamma + \eta_{\gamma,i}, \quad \eta_{\gamma,i} \sim IID(0, \Omega_\gamma) \\ vec(\mathbf{\Gamma}_i) &= vec(\mathbf{\Gamma}) + \eta_{\Gamma,i}, \quad \eta_{\Gamma,i} \sim IID(0, \Omega_\Gamma) \\ \pi_i &= \pi + \eta_{\pi,i}, \quad \eta_{\pi,i} \sim IID(0, \Omega_\pi) \end{aligned} \tag{7}$$

It is assumed that $\eta_{\pi,i}$ is distributed independently of $\gamma_j, \mathbf{\Gamma}_j, \epsilon_{jt}, v_{jt}$ and $\mathbf{f}_t$ $\forall i, j, t$.

Regarding the idiosyncratic errors and common factors, the m-column vector f_t is assumed to follow a covariance stationary process independent of the individual specific errors $\epsilon_{it'}$ and $v_{it'}$ $\forall i, t, t'$. On the other hand, the vector of errors ϵ_{it} is assumed to be independently distributed of the v_{it} and cross-sectionally correlated.

Let $\mathbf{z_{it}} = \left(y_{it}, \mathbf{x}_{it}^{'}, \mathbf{g}_{it}^{'}\right)$, and write (6) compactly as

$$\mathbf{A}_{0i} \mathbf{z}_{it} = \mathbf{c}_i + \mathbf{A}_{1i} \mathbf{z}_{i,t-1} + \mathbf{C}_i \mathbf{f}_t + \mathbf{e}_{it}, \tag{8}$$

where $\mathbf{c}_i = \left(c_{yi}, \mathbf{c}_{\omega i}^{'}\right)$, $\mathbf{C}_i = \left(\gamma_i, \mathbf{\Gamma}_i^{'}\right)^{'}$,

$$\mathbf{A}_{0i} = \begin{bmatrix} 1 & -\beta_{0i}^{'} & \mathbf{0}_{1\times k_g} \\ \mathbf{0}_{k_g\times 1} & \mathbf{I}_{k_x} & \mathbf{0}_{k_g\times k_g} \\ \mathbf{0}_{k_g\times 1} & \mathbf{0}_{k_g\times k_x} & \mathbf{I}_{k_g} \end{bmatrix} \mathbf{A}_{1i} = \begin{bmatrix} \phi_i & \beta_{1i}^{'} & \mathbf{0}_{1\times k_g} \\ \alpha_{x_i} & \mathbf{0}_{k_g\times k_x} & \mathbf{0}_{k_g\times k_g} \\ \alpha_{g_i} & \mathbf{0}_{k_g\times k_x} & \mathbf{0}_{k_g\times k_g} \end{bmatrix},$$

$\mathbf{e}_{it} = \left(\epsilon_{it}, \mathbf{v}_{it}^{'}\right)^{'}$ is a serially correlated error process, and $\mathbf{\Gamma}_i = (\mathbf{\Gamma}_{xi}\mathbf{\Gamma}_{hi})$, $\alpha_i = (\alpha_{\mathbf{x_i}}, \alpha_{\mathbf{g_i}})$ are a partition matrix and vector, respectively. $\mathbf{A}_{0i}$ is invertible, premuliply (8) by $\mathbf{A}_{0i}^{-1}$, to obtain the following reduced form VAR(1) representation of $\mathbf{z}_{it}$ with serially correlated errors,

[1] $\mathbf{g}_{it}$ contains variables that depend on the common factors but not on the dependent variable.

$$\mathbf{z}_{it} = \mathbf{c}_{zi} + \mathbf{A}_i\mathbf{z}_{i,t-1} + \mathbf{A}_{0i}^{-1}\mathbf{C}_i\mathbf{f}_t + \mathbf{e}_{zit},$$

where $\mathbf{c}_{zi} = \mathbf{A}_{0i}^{-1}\mathbf{c}_i$, $\mathbf{e}_{zit} = \mathbf{A}_{0i}^{-1}\mathbf{e}_{it}$ and $\mathbf{A}_i = \mathbf{A}_{0i}^{-1}\mathbf{A}_{1i}$.

It then follows that in the case where $rank\left(E\left[\mathbf{C_i}\right]\right) = rank\left(E\left[\mathbf{C}\right]\right) = m$ and assuming that N is large, we have

$$\mathbf{f}_t = \mathbf{G}(L)\tilde{z}_{wt} + O_p\left(N^{-1/2}\right), \tag{9}$$
$$\mathbf{G}(L) = \left(\mathbf{C}'\mathbf{C}\right)^{-1}\mathbf{C}'\mathbf{\Lambda}^{-1}(L),$$

where, $\tilde{z}_{wt} = \bar{z}_{wt} - \bar{c}_{zw}$, $\bar{z}_{wt} = (\bar{y}_{wt}, barx'_{wt}, barg'_{wt})' = \sum_{i=1}^{N} w_i z_{it}$, and $\bar{c}_{zw} = \sum_{i=1}^{N} w_i \left(I_{k+1} - \mathbf{A}_i\right)^{-1}\mathbf{c}_{zi}$. Substituting (9) into (6), we get

$$y_{it} = c_{yi}^{*} + \phi_i y_{i,t-1} + \beta_{0i}'\mathbf{x}_{it} + \beta_{1i}'\mathbf{x}_{i,t-1} + \sum_{\ell=0}^{p_T}\delta_{i\ell}'\bar{\mathbf{z}}_{w,t-\ell} + e_{yit}, \tag{10}$$

where p_T is the number of lags, $\delta_i(L) = \mathbf{G}'(L)\gamma_i$, and $c_{yi}^{*} = c_{yi} - \delta_i(1)\bar{c}_{zw}$. The error term, e_{yit} can be decomposed into three parts, an idiosyncratic term, ϵ_{it}, an error component due to the truncation of infinite polynomial distributed lag function, and an error component due to the approximation of unobserved common factors.

Let $\hat{\pi}_i = \left(\hat{\phi}_i, \beta_{0i}', \beta_{1i}'\right)'$ be the least square estimates of π_i. It can be shown that

$$\hat{\pi}_i = \left(\mathbf{\Xi}_i'\bar{\mathbf{M}}_q\mathbf{\Xi}_i\right)^{-1}\mathbf{\Xi}_i'\bar{\mathbf{M}}_\mathbf{q}\mathbf{y}_i, \tag{11}$$

where,

$$\mathbf{\Xi}_i = \begin{pmatrix} y_{i,P_T} & x'_{i,P_T+1} & x'_{i,P_T} \\ y_{i,P_T+1} & x'_{i,P_T+2} & x'_{i,P_T+1} \\ \vdots & \vdots & \vdots \\ y_{i,T-1} & x'_{i,T} & x'_{i,T-1} \end{pmatrix}$$

$$\bar{\mathbf{M}}_\mathbf{q} = \mathbf{I}_{T-p_T} - \bar{\mathbf{Q}}_\omega(\bar{\mathbf{Q}}_\omega'\bar{\mathbf{Q}}_\omega)^{+}\bar{\mathbf{Q}}_\omega' \tag{12}$$

$$\bar{\mathbf{Q}}_\omega = \begin{pmatrix} 1 & \bar{z}'_{P_T+1} & \bar{z}'_{P_T} & \cdots & \bar{z}'_1 \\ 1 & \bar{z}'_{P_T+2} & \bar{z}'_{P_T+1} & \cdots & \bar{z}'_2 \\ \vdots & \vdots & \vdots & & \\ 1 & \bar{z}'_T & \bar{z}'_{T-1} & \cdots & \bar{z}'_{T-P_T} \end{pmatrix},$$

and $\mathbf{y}_i = (y_{i,P_T+1}, y_{i,P_T+2}, \cdots, y_{i,T})'$. The mean group estimator is given by,

$$\hat{\pi}_{MG} = \frac{1}{N}\sum_{i=1}^{N}\hat{\pi}_i. \tag{13}$$

3 Data

The data used for the estimation of the incidence of fiscal rules on the probability of a sudden stop consists of 62 countries between 1980Q1 and 2015Q4. This information was collected from four distinct sources: i). Cavallo et al. (2017)'s sudden stop database; ii). IMF (2017)'s information on worldwide fiscal rule implementations; iii). the World Bank's Quarterly Public Sector Debt database; and, iv). information reported by the FRED on historical oil prices. Table 1 presents the variables used by Cavallo et al. (2017) in his determinants of sudden stops paper. We include this same variables in our empirical analysis. Table 2 shows a list of the countries and relevant information regarding the number of periods in which a sudden stop is registered, the number of periods in which each country has had a fiscal rule, and the number of periods in which a sudden stop has occurred while the country had a fiscal rule.

Table 1: Sudden stops regressors

Variable	Definition
Fiscal Rule	1 if the country has at least a rule of expenditure, debt o balance in place
Short-term Debt % Total Debt	Gross Public Sector Debt, Central Gov., Short-term, as % of total debt
Change Ln(Brent)	Brent USD/Barrel, quarterly average, natural logarithm, year-to-year change
U.S. stock market volatility	Proxy of global risk. Stock market implicit volatility based on the VIX
Average Growth Rate of M	Proxy of global liquidity. Average growth of M2 in US, EU and Japan and growth of M4 in UK
Growth Rate of World's GDP	Year-to-year growth rate of world's GDP taken form IMF
Average Int. Rate on LT Govt Bonds	Average interes rate on long-term government bonds in US, EU and Japan
Foreign Liabilities % of GDP	Banks foreign borrowing as share of GDP
CA/AT	Proxy of potential changes in real exchange rate in case of sudden stop. Share of current account balance over absorption of tadables
Real GDP Growth, Percent	Year-to-year growth rate of real GDP for each country
CPI Inflation, Percent	Country's average CPI inflation rate
Openness Indicator % GDP	Sum of Goods, Value of Exports, FOB and Goods, Value of Imports, CIF, as % of GDP
Credit to the Private Sector as % of GDP	Bank credit to the private sector as percentage of GDP
Institutions	Index of corruption form the risk rating index produced by the Political Risk Services Group
Contagion, land borders	1 if the country has a foreigner's sudden stop in period t and in period t-1 a neigbour country had a foreigne's sudden stop
Flexible Exchange Rate (FER)	Clasification of exchange rate regimes constructed by Reinhart and Rogoff (2004)
Inflation Targeting	1 if the country has inflation targeting regime
IT X FER	Interaction between Inflation Targeting and Flexible Exchange Rate

Table 1 lists the variables used as regressors in the Sudden Stop analysis. Excluding Fiscal Rule, Change Ln(Brent), and Short-term Debt % Total Debt variables, the dataset is constructed by Cavalo et al. (2017).

For studying the effect of fiscal rules on sovereign risk, we use an unbalanced panel of 21 countries between 2000Q1 and 2016Q3. Information sources and description of the variables used as regressors are presented in Table 3. This regressors correspond to those used by recent sovereign risk studies, for example Ordonez et al. (2017).

4 Results

This section presents estimation results. The first subsection shows findings on the effect of fiscal rule implementations on the probability of a sudden stop, while the second shows its influence on sovereign default risk.

Table 2: Fiscal rule and sudden stops

Country		# of Periods				Range Dates
		Total	Net SS	Fiscal Rule	Rule and Net SS	
Latin America and the Caribbean						
	Argentina	144	22	36	8	1980q1-2015q4
	Brazil	144	6	64	4	1980q1-2015q4
	Chile	100	19	60	10	1991q1-2015q4
	Colombia	80	0	64	0	1996q1-2015q4
	Costa Rica	80	8	60	8	1987q1-2015q4
	Ecuador	92	3	52	0	1993q1-2015q4
	Mexico	144	6	40	2	1980q1-2015q4
	Panama	72	2	36	0	1998q1-2015q4
	Paraguay	60	6	4	0	2001q1-2015q4
	Peru	130	14	64	9	1980q1-2015q4
	Uruguay	64	6	40	6	2000q1-2015q4
OECD						
	Australia	144	16	88	9	1980q1-2015q4
	Austria	144	15	84	12	1980q1-2015q4
	Belgium	56	5	56	5	2002q1-2015q4
	Canada	144	0	32	0	1980q1-2015q4
	Czech Republic	92	8	48	2	1993q1-2015q4
	Denmark	144	40	96	27	1980q1-2015q4
	Estonia	96	16	92	16	1992q1-2015q4
	Finland	144	14	84	4	1980q1-2015q4
	France	144	14	96	11	1980q1-2015q4
	Germany	144	13	124	13	1980q1-2015q4
	Greece	140	24	92	21	1980q1-2015q4
	Hungary	105	21	48	13	1989q4-2015q4
	Iceland	144	22	20	4	1980q1-2015q4
	Ireland	140	20	96	18	1981q1-2015q4
	Israel	144	20	96	14	1980q1-2015q4
	Italy	144	22	96	21	1980q1-2015q4
	Japan	144	14	124	14	1980q1-2015q4
	Latvia	92	9	48	7	1993q1-2015q4
	Lithuania	92	13	76	13	1993q1-2015q4
	Luxembourg	56	7	56	7	2002q1-2015q4
	Netherlands	144	21	96	19	1980q1-2015q4
	New Zealand	144	15	88	9	1980q1-2015q4
	Norway	144	24	60	16	1980q1-2015q4
	Poland	106	16	64	12	1985q1-2015q4
	Portugal	144	18	96	18	1980q1-2015q4
	Slovakia	92	17	48	11	1993q1-2015q4
	Slovenia	96	14	64	9	1992q1-2015q4
	Spain	144	19	96	14	1980q1-2015q4
	Sweden	144	20	84	16	1980q1-2015q4
	Switzerland	68	13	52	13	1999q1-2015q4
	United Kingdom	144	18	96	11	1980q1-2015q4
	United States	144	24	88	16	1980q1-2015q4
Emerging and Others						
	Bulgaria	100	10	52	7	1991q1-2015q4
	Cape Verde	72	9	72	9	1998q1-2015q4
	Croatia	92	19	28	7	1993q1-2015q4
	Cyprus	78	5	48	5	1980q2-2015q4
	Georgia	76	10	8	2	1997q1-2015q4
	India	144	21	20	3	1980q1-2015q4
	Indonesia	140	11	124	10	1981q1-2015q4
	Malaysia	68	8	68	8	1999q1-2015q4
	Malta	84	11	48	7	1995q1-2015q4
	Mauritius	64	2	32	2	2000q1-2015q4
	Mongolia	49	8	12	5	1999q1-2015q4
	Montenegro	36	0	8	0	2007q1-2015q4
	Namibia	68	2	60	2	1999q1-2015q4
	Pakistan	144	25	44	8	1980q1-2015q4
	Romania	100	12	36	7	1991q1-2015q4
	Serbia	36	0	20	0	2007q1-2015q4
	Singapore	84	7	84	7	1995q1-2015q4
	Sri Lanka	144	13	52	8	1980q1-2015q4
	Uganda	70	4	12	0	1980q1-2015q4
	Total	6,726	801	3,832	539	

Table 2 presents the time horizon available for each country in the sample and the number of periods in which each country had a fiscal rule in place, presented a sudden stop, and in how many presented a sudden stop with a fiscal rule in place.

Table 3: Sovereign risk regressors

Variable	Definition	Source
Fiscal Rule	1 if the country has at least a rule of expenditure, debt o balance in place	IMF
Short-term Debt % Total Debt	Gross Public Sector Debt, Central Gov., Short-term, as % of total debt	World Bank
Gross External Debt Position % GDP	Gross Public Sector Debt, Central Gov., All maturities, All instruments, Nominal Value, % of GDP	IMF/World Bank
Gross Capital Formation % GDP	Gross Capital Formation as % of GDP	IMF
Current Account Balance % GDP	Current Account, Net (excluding exceptional financing) as % of GDP	IMF
Openness Indicator % GDP	Sum of Goods, Value of Exports, FOB and Goods, Value of Imports, CIF, as % of GDP	IMF/WTO
Real Exchange Rate	Real Effective Exchange Rate, based on Consumer Price Index	IMF/FRED
Reserves % GDP	Total reserves minus gold as % of GDP	IMF
Share Index	Country Stock Exchange Index	Bloomberg
Share Index Volatility	Standard deviation of Country Stock Exchange Index using 24-month windows	Authors' calculations/ Bloomberg
Forex Volatility	Standard deviation of official Foreign Exchange rate with respect to USD using 24-month windows	Authors' calculations/ Bloomberg
Rule of Law	Rule of Law Index	World Bank

Table 3 lists the variables used as regressors in the Sovereign Risk analysis and its respective sources. This sample includes Australia, Belgium, Holland, Denmark, Norway, Germany, Austria, Finland, Portugal, France, Sweden, Greece, Ireland, Slovakia, Poland, Mexico, Brazil, Colombia, Croatia, Peru, and Indonesia between 2000q1 and 2016q3.

4.1 Effects of fiscal rule implementation on the probability of a sudden stop

The defining characteristic of a sudden stop is a large and rapid reversal in external capital inflows which reflects frequently in a country's current account jump. Access to foreign financing is sharply reduced, and countries experience strong real depreciations, sharp declines in asset prices, financial turbulence and deep economic recessions. While some countries have experienced sudden stops isolatedly, they frequently occur in clusters (Bordo et al., 2010; Korinek and Mendoza, 2014).

While sudden stops have been studied from different theoretical perspectives, macroeconomic models based on occasionally binding collateral constraints that trigger a financial amplification mechanism similar to the debt deflation mechanism of Fisher (1933) have proven particularly useful for yielding both qualitative and quantitative predictions in line with the sudden stops' stylized facts. Important policy implications derive from these models. A particularly relevant set of measures deal with ex-ante policies that can be implemented in order to reduce the probability of occurrence of a sudden stop. One of these "macro-prudential" policies deals with the importance of fiscal discipline (see, for instance, Bianchi and Mendoza 2010; Bianchi, 2011). In this subsection we study the effect of implementing fiscal rules, an adequate proxy of a government's commitment to impose current and future fiscal discipline, on the probability of a sudden stop event.

The same control variables as is Cavallo et al. (2017) and Cavallo (2019) are used as covariates in the probabilistic model. A dummy variable indicating whether a fiscal rule existed in each country at each point in time is additionally included. Our unit of observation is country i at time t. A value of 1 reported for the variable fiscal rule indicates that at time t country i had a fiscal rule in place. Alternative specifications are used for robustness.

Table 4 shows estimation results for three alternative models. The first, Baseline, corresponds to the estimation of Cavallo et al. (2017), in which a dummy variable for fiscal rules is included as a regressor. This dummy variable takes on the value one when country i at time t has a fiscal rule (of any type) and zero otherwise. The model labeled Bonanza is basically identical, but considering only those periods in which the country experienced an economic bonanza. The concept of "bonanza-filtered sudden stops", introduced by Cavallo

Table 4: Estimation results. Dependent variable is the probability of a sudden stop

	Base line		Bonanza		Time FE
VARIABLES	Net	Net	Net	Net	Net
Fiscal Rule (lagged, 5 years)	-0.276***	-0.314***	-0.219***	-0.264***	-0.374***
	(0.0732)	(0.0780)	(0.0575)	(0.0633)	(0.105)
Change Ln(Brent) (lagged)		0.0208*		0.0254**	
		(0.0124)		(0.0106)	
U.S. stock market volatility (lagged)	-0.00175	0.00187	-0.00451	-0.000404	
	(0.00532)	(0.00514)	(0.0127)	(0.0128)	
Average Growth Rate of M (lagged)	2.62e-05	-0.000579	-0.00102	-0.00124	
	(0.00175)	(0.00183)	(0.00184)	(0.00195)	
Growth Rate of World's GDP (lagged)	-0.0520	0.0250	-0.0315	0.0569	
	(0.109)	(0.0713)	(0.0773)	(0.0507)	
Average Int. Rate on LT Govt Bonds (lagged)	-0.0632***	-0.0410	-0.0475	-0.00779	
	(0.0135)	(0.0295)	(0.0365)	(0.0548)	
Foreign Liabilities as % of GDP (lagged)	0.000707***	0.000912***	0.000626***	0.000900***	0.00118***
	(0.000202)	(0.000329)	(0.000156)	(0.000276)	(0.000325)
CA/AT (lagged)	-0.000247	-0.000258	-0.000335	-0.000327	-7.87e-05
	(0.000584)	(0.000557)	(0.000810)	(0.000771)	(0.000597)
Real GDP Growth, Percent (lagged)	-0.165***	-0.172***	-0.191***	-0.197***	-0.153***
	(0.0247)	(0.0253)	(0.0152)	(0.0150)	(0.0203)
CPI Inflation, Percent (lagged)	-0.0426**	-0.0406**	-0.0358***	-0.0306***	-0.0446**
	(0.0170)	(0.0204)	(0.00835)	(0.0101)	(0.0179)
Openness Indicator % of GDP (lagged)	-0.00650	-0.00375	-0.000994	0.00158	-0.0117
	(0.00567)	(0.00595)	(0.00514)	(0.00552)	(0.00734)
Credit to the Private Sector as % of GDP	-3.41e-05***	-3.21e-05***	-3.35e-05***	-3.47e-05***	-3.75e-05***
	(1.26e-06)	(2.55e-06)	(2.09e-06)	(1.73e-06)	(2.64e-06)
Institutions	-0.0511	-0.0418	-0.0453	-0.0375	-0.0349
	(0.0355)	(0.0369)	(0.0354)	(0.0355)	(0.0392)
Contagion, land borders (lagged)	0.0223	-0.0311	-0.0776	-0.171*	-0.194
	(0.119)	(0.133)	(0.0885)	(0.0987)	(0.175)
Flexible Exchange Rate (FER)	-0.425	-0.392	-0.303	-0.327	-0.536
	(0.480)	(0.471)	(0.497)	(0.473)	(0.482)
Inflation Targeting	-0.180	-0.0822	-0.433*	-0.378	-0.0736
	(0.256)	(0.283)	(0.242)	(0.267)	(0.205)
IT X FER	0.624	0.482	0.420	0.397	0.743
	(0.465)	(0.416)	(0.421)	(0.416)	(0.516)
Constant	2.053	1.092	1.498	0.551	1.716
	(1.936)	(2.241)	(2.326)	(2.570)	(1.691)
FE	Country	Country	Country	Country	Country and Date
Observations	2,568	2,406	2,554	2,392	2,424

Standard errors clustered by region in parentheses
*** p<0.01, ** p<0.05, * p<0.1

et al. (2017), comprises an alternative definition of sudden stops accounting for potential mitigating or reinforcing triggers. This alternative concept of a sudden stop accounts for the fact that favorable terms of trade shocks can offset contractions in capital inflows. Therefore, under this scenario the sample of sudden stop episodes is reduced to those that happen when there is no alternative funding mechanism directly available from the current account. The last model includes time fixed effects. Note that all models include country fixed effects, the BRENT index and several fiscal, macroeconomic, and financial variables which are important determinants of overall macroeconomic stability.

All three models provide evidence in line with the hypothesis that imposing a fiscal rule reduces the probability of occurrence of a sudden stop. The effect is larger in all three models when the BRENT index is included. In line with results from previous studies, real GDP growth is negatively associated with the probability of a sudden stop. In other words, countries growing faster are less likely to experience a sharp capital reversal. Similarly, countries with a deeper financial system, measured by the ratio of credit to the private sector to GDP, are also less prone to sudden stops. Somehow paradoxically, our results also indicate that an increase in CPI inflation reduces the probability of a sudden stop. However, inflation targeting countries present also a lower probability of experiencing a sudden stop, albeit under only two specifications these results are statistically different from zero at conventional levels.

In sake of robustness, we estimated these three models including an additional regressor accounting for government debt management. This regressor is the ratio of short term government debt to total government debt. Estimation results are presented in Table 5. Results are qualitatively identical as those reported above. Specifically, fiscal rule implementation reduces the probability that a sudden stop occurs, all else equal. Importantly, the debt management variable is positive and statistically significant under all three models. This interesting result shows that countries in which the weight of short term government debt to total government debt is high are more likely to experiment a sudden stop than otherwise equal countries that have a lower share of short term government debt. This result indicates that government debt management matters for macroeconomic stability.

Summing-up, our results indicate that implementing a fiscal rule is quite important for macroeconomic stability, as countries in which they are implemented significantly reduce the probability of a capital flow reversal. This result, obtained by adding a fiscal rule implementation variable to conventional models of sudden stops, is robust to several specifications and to the addition of a debt management variable.

Interestingly, when we estimate models in which countries are classified according to the type of fiscal rule that they have implemented, results are inconclusive. This may obey to the fact that although information is rich, it is not rich enough to do this classification properly as some categories have few observations.

Table 5: Estimation results including a debt management variable. Dependent variable is the probability of a sudden stop

	Base line		Bonanza		Time FE
VARIABLES	Net	Net	Net	Net	Net
Fiscal Rule (lagged, 5 years)	-0.418***	-0.457***	-0.355***	-0.426***	-0.315
	(0.0756)	(0.0501)	(0.0637)	(0.0228)	(0.291)
Short-term Debt % Total Debt (lagged)	0.0298***	0.0302***	0.0326***	0.0334***	0.0252***
	(0.000739)	(0.000584)	(0.00147)	(0.00191)	(0.00654)
Change Ln(Brent) (lagged)		0.00793		0.00106	
		(0.00929)		(0.0116)	
U.S. stock market volatility (lagged)	0.0170	0.0172	0.0159***	0.0165***	
	(0.0162)	(0.0167)	(0.00391)	(0.00444)	
Average Growth Rate of M (lagged)	-0.00352	-0.00375	-0.00689**	-0.00688**	
	(0.00313)	(0.00302)	(0.00279)	(0.00317)	
Growth Rate of World's GDP (lagged)	-0.0489	-0.0279	-0.0516	-0.0491	
	(0.130)	(0.108)	(0.0887)	(0.0636)	
Average Int. Rate on LT Govt Bond (lagged)	-0.258	-0.245	-0.381***	-0.366***	
	(0.200)	(0.195)	(0.0901)	(0.0825)	
Foreign Liabilities as % of GDP (lagged)	0.00174***	0.00173***	0.000642***	0.000569***	0.00159***
	(0.000294)	(0.000344)	(0.000112)	(0.000168)	(0.000175)
CA/AT (lagged)	-7.28e-05***	-7.14e-05***	0.000261***	0.000261***	0.000431***
	(1.10e-05)	(5.79e-06)	(2.22e-05)	(2.59e-05)	(0.000104)
Real GDP Growth, Percent (lagged)	-0.0837***	-0.0827***	-0.0779***	-0.0777***	-0.0228***
	(0.0236)	(0.0245)	(0.0194)	(0.0211)	(0.00732)
CPI Inflation, Percent (lagged)	-0.0726	-0.0648	0.0301	0.0370	-0.0308
	(0.0560)	(0.0550)	(0.0316)	(0.0314)	(0.0960)
Openness Indicator % of GDP (lagged)	-0.0342***	-0.0343***	-0.0302***	-0.0303***	-0.0393***
	(0.00458)	(0.00478)	(0.0107)	(0.0108)	(0.00573)
Credit to the Private Sector as % of GDP	-2.38e-05	-2.69e-05	-3.66e-05	-3.99e-05	-3.98e-05*
	(2.41e-05)	(2.44e-05)	(3.93e-05)	(3.95e-05)	(2.23e-05)
Institutions	-0.284***	-0.286***	-0.291***	-0.294***	-0.304***
	(0.0440)	(0.0445)	(0.0244)	(0.0250)	(0.0488)
Contagion, land borders (lagged)	0.246***	0.228***	-0.151**	-0.163**	0.155
	(0.0656)	(0.0558)	(0.0721)	(0.0823)	(0.161)
Flexible Exchange Rate (FER)	0.474	0.541	-0.119	-0.111	0.563
	(0.378)	(0.364)	(0.588)	(0.546)	(0.638)
Inflation Targeting	-1.001	-0.941	-0.786	-0.727	-0.392
	(0.762)	(0.778)	(1.662)	(1.662)	(1.052)
IT X FER	-0.811***	-0.874***	0.827	0.840*	-0.880*
	(0.0483)	(0.0286)	(0.543)	(0.477)	(0.476)
Constant	19.32***	19.26***	20.23***	20.34***	20.38***
	(1.340)	(1.428)	(0.944)	(1.006)	(1.190)
FE	Country	Country	Country	Country	Country and Date
Observations	1,036	1,035	1,001	1,000	950

Standard errors clustered by region in parentheses
*** p<0.01, ** p<0.05, * p<0.1

4.2 Effects of fiscal rule implementation on sovereign debt risk

Following the most traditional strand of the literature on sovereign default risk, we construct our risk indicator as the difference between the yield of a sovereign security of a country and the yield of a United States Treasury bond of a comparable maturity. We focus on 7-, 10-, and 15 -year maturities. We focus in these maturities because sovereign default risk deals mostly with solvency problems. This information is collected from secondary bond markets.

Following recent papers on sovereign risk, we include three groups of regressors. The first group includes variables reflecting the government's debt situation; the second group includes variables reflecting the state of the economy (e.g., GDP, investment and external sector variables); and the third includes institutional variables. Existing studies are emphatic in showing that the expected effect of most of these variables on yield spreads should be unambiguous (see, for instance, Eichler and Maltritz, 2013). A notable exception is the effect of the economy degree of openness, for which the expected sign is unclear. We add a variable that has not been introduced in previous studies, namely a dichotomous variable taking on the value of one when a country has a fiscal rule and zero when it does not.

Results for the Pesaran (2007) panel unit root test for the variables included in this study show that most series are panel stationary. Concretely, the spreads and all but one regressor, the Rule of Law Index, are $I(0)$. This non-stationary variable is included in first differences. Results for the CD test of Pesaran (2004) show strong statistical evidence of cross-sectional dependence, showing the relevance of using a panel data method that accounts for it. This implies that studies on sovereign risk that use yield spreads and ignore cross-sectional dependence find biased estimates of the effects of country-specific and common global factors on default risk.

Several observable global factors are included. Specifically, we use the VIX index as a measure of the price of risk, S&P country credit ratings, time-dummy variables taking on the value of one for the time-periods in which quantitative easing policies were implemented and the United States short-term interest rate as a measure of the "global" monetary policy stance. First lags of the dependent variables are included in the regressions as in Attinasi et al. (2009). Their inclusion allows testing for the contemporaneous effect of the regressors on sovereign risk spreads and accounts for the fact that bond yield spreads are highly persistent (i.e. some degree of serial correlation exists).

Group-mean estimation results, following Chudik and Pesaran (2015) indicate that none of the included variables is relevant in explaining observed country and time-series differences in sovereign default risk. Similar results have been obtained in papers that use this methodology, as its dynamic nature leads to the conclusion that only the autorregresive components matter. In other words, these results suggest that sovereign default risk today only depends on sovereign default risk observed the period before (see, for instance, Ordonez-Callamand et al., 2017).

However, other results are encountered when the dynamic structure of Chudik and Pesaran (2015) is ignored. The models of Pesaran (2006) and Westerlund et al. (2015) are similar in the sense that they control for endogeneity and for cross-sectional dependence, but ignoring the (possible) dynamic structure of the panel.

Table 6 presents estimation results when the method proposed by Westerlund et al. (2017) is used. Note that results show that the null hypothesis that none of the included covariates is significant in explaining sovereign risk is rejected at very conservative statistical levels. Hence, these resulkts indicate that the variables included in our model are jointly significant in explaining observed differences in sovereign default risk, measured by treasury bond yield differentials. These results hold for all maturities and when either 16 or 23 countries are used in the sample. Under the methodology proposed by Westerlund et al. (2017) it is not possible to compute the significance of individual variables included as regressors in the model.

Table 6: Estimation results of Westerlund et al. (2017) test

	21 Countries			16 Countries (OECD)		
	7Y	10Y	15Y	7Y	10Y	15Y
Fiscal Rule (5 years lag)	-6.06	-5.21	-4.25	-7.93	-7.06	-6.52
Short-term Debt % of Total Debt	0.03	0.02	0.02	0.07	0.07	0.07
Gross External Debt Position % GDP	-0.04	-0.04	-0.04	-0.04	-0.05	-0.05
Gross Capital Formation % GDP	-20.64	-17.86	-17.17	-67.49	-65.16	-57.87
Current Account Balance % GDP	-0.04	-0.05	-0.05	0.00	0.00	0.00
Openness Indicator % GDP	-16.41	-15.61	-14.98	81.67	73.69	64.89
Real Exchange Rate	0.08	0.04	0.03	-0.10	-0.09	-0.08
Reserves % GDP	-4.68	-4.22	-3.96	-21.81	-18.80	-16.26
Share Index	0.00	0.00	0.00	0.00	0.00	0.00
Share Index Volatility	0.04	0.04	0.03	0.07	0.06	0.06
Forex Volatility	-0.18	-0.14	-0.03	0.82	1.20	2.17
Rule of Law	16.18	15.63	15.98	5.44	2.29	0.52
Pval	0.00	0.00	0.00	0.00	0.00	0.00

Note: 16 countries (OECD) includes Australia, Belgium, Holland, Denmark, Norway, Germany, Austria, Finland, Portugal, France, Sweden, Greece, Ireland, Slovakia, Poland, Mexico.

Results of the estimation of the model proposed by Pesaran (2006), complementing those reported above, are reported in Table 7. Note that this method indeed allows identifying the effect of individual variables on sovereign default risk. Estimation results show that introducing a fiscal rule reduces sovereign default risk, all else constant. Results are statistically significant at conventional levels, however, only for the set of 23 countries. This result is interesting, as it shows that only when emerging markets are included in the sample, statistical significance is obtained for the fiscal rule variable. In other words, fiscal rules are more important for emerging market economies than for developed ones for reducing sovereign risk perceptions.

Table 7: Estimation results of Pesaran (2006) test

	21 Countries (OECD+Emg)			16 Countries (OECD)		
	7Y	10Y	15Y	7Y	10Y	15Y
Fiscal Rule (5 years lag)	-0.399*	-0.364*	-0.335*	-0.426	-0.410	-0.385
	(0.212)	(0.204)	(0.197)	(0.265)	(0.261)	(0.254)
Short-term Debt % of Total Debt	0.0491	0.0271	0.00104	-0.00551	-0.00588	-0.00470
	(0.0409)	(0.0327)	(0.0238)	(0.0208)	(0.0201)	(0.0189)
Gross External Debt Position % GDP	0.117*	0.131***	0.140***	0.112***	0.113***	0.114***
	(0.0658)	(0.0496)	(0.0409)	(0.0428)	(0.0421)	(0.0400)
Gross Capital Formation % GDP	-23.94	-23.48	-21.85	-29.78	-30.23	-28.94
	(19.17)	(18.64)	(18.05)	-25.07	(24.30)	(23.50)
Current Account Balance % GDP	0.176	0.181	0.177	0.0187	0.00977	0.00454
	(0.133)	(0.115)	(0.129)	(0.0325)	(0.0312)	(0.0312)
Openness Indicator % GDP	32.51	35.45*	37.94*	41.95	46.09*	50.17*
	(20.23)	(20.51)	(20.44)	(26.14)	(26.40)	(26.11)
Real Exchange Rate	0.162**	0.154**	0.144***	0.212***	0.207***	0.200***
	(0.0633)	(0.0597)	(0.0551)	(0.0784)	(0.0725)	(0.0653)
Reserves % GDP	-0.348	2.322	1.976	1.597	5.577	5.608
	(8.271)	(8.772)	(9.671)	(10.40)	(11.10)	(12.27)
Share Index	-0.00202**	-0.00178**	-0.00197**	-0.00244*	-0.00216**	-0.00239**
	(0.000974)	(0.000805)	(0.000929)	(0.00127)	(0.00104)	(0.00121)
Share Index Volatility	0.00189	0.00235	0.00381	0.00302	0.00366	0.00534
	(0.00174)	(0.00188)	(0.00257)	(0.00217)	(0.00234)	(0.00328)
Forex Volatility	34.67***	34.20***	33.82***	44.98***	44.35***	44.42***
	(11.61)	(11.82)	(12.67)	(14.34)	(14.65)	(15.78)
Rule of Law	-1.610	-1.398	-1.924	-2.354	-2.215	-2.670
	(1.795)	(1.970)	(2.018)	(1.973)	(2.141)	(2.199)

Note: 16 countries (OECD) includes Australia, Belgium, Holland, Denmark, Norway, Germany, Austria, Finland, Portugal, France, Sweden, Greece, Ireland, Slovakia, Poland, Mexico. Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

5 Conclusions

This paper studies the effect of fiscal rules on sovereign default risk and on the probability of a sudden capital flow reversal. Using a sample that includes many countries for a long period of time, we show that the introduction of a fiscal rule is beneficial for countries as it reduces both sovereign risk and the probability of a sudden stop. Effects are larger for emerging market economies than for developed countries.

While there is a vast literature studying the effect of fiscal rule implementation on macroeconomic stability, to our knowledge this is the first paper studying the effect of fiscal rules on sovereign risk and the probability of a sudden stop. Therefore, our results extend the existing literature by showing that an additional benefit of implementing fiscal rules is reducing the cost of financing of governments and inducing more stability to international capital flows. This advantage is specially important for emerging market economies in which capital flow surges and reversions lead to overall macroeconomic instability.

During the Covid-19 pandemic many countries have relaxed their fiscal rules to attend the social and economic crises through fiscal expenditure expansion. Countries are providing exceptional support to families and firms and suffering significant losses in public revenues. Debt ratios are rising. Getting fiscal policy right and maintaining financial stability will be key to ensuring a return to growth and avoid a lost decade, especially in emerging market economies. To this extend, fiscal rule relaxations should be only temporary and countries should return to their implementation soon after the health and economic emergency ends.

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