INTERNATIONAL MONETARY FUND

Fiscal Rules, Robust Correction Mechanisms, and Sovereign Spreads

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WP/25/195

2025
SEP

WORKING PAPER

 WP/25/195

IMF Working Paper
Western Hemisphere Department

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Authorized for distribution by Nigel Chalk
September 2025

ABSTRACT: Both policy advice and economic theory advocate for fiscal rules with a clear anchor that reflects fiscal risk and a robust correction mechanism that implements a more ambitious fiscal consolidation when fiscal risk is higher. However, among more than 120 countries with fiscal rules, only six are identified as implementing such robust correction mechanisms: Armenia, Costa Rica, Cyprus, Czech Republic, Poland, and Slovakia. Using synthetic control methods and dynamic panel regressions, this paper finds that the introduction of fiscal rules with robust correction mechanisms has been particularly effective in these countries, triggering a persistent median spread reduction of about 25 percent, or 75 basis points, over one year.

JEL Classification Numbers:	C22, E61, E65, G12
Keywords:	Fiscal Rules, Fiscal Risk, Sovereign Spreads, Robust Correction Mechanisms
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* We thank Michal Andrle, Emine Boz, Gabriela Cugat, Giovanni Dell'Ariccia, Ricardo Duque, Davide Furceri, Vitor Gaspar, Pierre-Olivier Gourinchas, Raphael Lam, Prachi Mishra, Adrian Peralta-Alva, Sofia Pessoa, Andrea Presbitero, and Francisco Roldan for useful comments. We also thank Carlos Angulo for outstanding research assistance. The views expressed in this paper are those of the authors and do not necessarily represent the views of the IMF, its Executive Board, or IMF management.

WORKING PAPERS

Fiscal Rules, Robust Correction Mechanisms, and Sovereign Spreads

Prepared by Julien Acalin[1], Leonardo Martinez[1], and Francisco Roch[2]

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1 Introduction

The importance of fiscal rules has been re-emphasized after COVID-19 pushed public debt to historically high levels, with economies continuing to face challenging economic conditions and increased spending pressures due to population aging, climate transition, and geopolitical tensions.[1] In this difficult context, the commitment to future policies implied by fiscal rules can mitigate fiscal risk and thus improve access to debt markets (Hatchondo et al., 2022a). For example, IMF (2021) underscores that "a credible commitment to fiscal sustainability can buy flexibility and time. When lenders trust that governments are fiscally responsible, financing deficits is easier and cheaper."[2]

This paper contributes to the literature by showing that well-designed fiscal rules have been effective in mitigating fiscal risk, measured by sovereign bond spreads (the difference between the implicit yield of government bonds and a comparable risk-free interest rate). In particular, we focus on one fiscal rule feature that could improve compliance and thus the performance of fiscal rules: Robust correction mechanisms, which specify automatic corrective actions when fiscal targets are breached, including pre-specified fiscal measures. For example, incentives to comply with a rule's debt ceiling could be stronger if not complying implies corrective actions such as increasing the fiscal balance to reduce the debt level. However, if in turn not complying with this increase in the fiscal balance has no consequence, promising this increase may not lend much credibility to the fiscal rule. In contrast, such fiscal balance increase could be more credible if pre-specified measures to support this increase (for example, limiting the indexation of public wages) are part of the rule (constituting a robust correction mechanism).

In our empirical section, we use synthetic control methods (Abadie, 2021) to identify the effects of introducing fiscal rules with robust correction mechanisms (FRRC) on sovereign spreads. We find that FRRC trigger a median spread reduction of about 25 percent, or 75 basis points for the average economy in our sample, over one year. This result remains robust under alternative specifications. Then, we use dynamic panel regressions to study the longer-term effects of FRRC and again find that they significantly reduce fiscal risk in the same proportions, even when compared with other fiscal rules.

[1] According to Lledó et al. (2017), "A fiscal rule is a long-lasting constraint on fiscal policy through numerical limits on budgetary aggregates."

[2] David et al. (2022) and End and Hong (2022) show that an improved commitment to future fiscal consolidation reduces fiscal risk, and thus improves economic outcomes. Fiscal rules also promote fiscal discipline, enhance stability and predictability in fiscal policy, and improves accountability and transparency.

1.1 Robust Correction Mechanisms

We focus on robust correction mechanisms because they are consistent with both policy advice and economic theory advocating for more ambitious fiscal consolidation when fiscal risk is higher.[3] Caselli et al. (2022) states that "A country whose debt level exceeds the safety margin to its debt limit should commit to a medium-term fiscal path that brings it back to the anchor over time. The pace of adjustment set in the fiscal plans should be based on an assessment of risks: the higher the risk, the faster the adjustment...". Bohn (1998, 2008) shows that a fiscal reaction function such that the primary fiscal balance increases in the level of debt (which can be associated with the level of fiscal risk) is sufficient for the intertemporal government budget constraint to hold. Hatchondo et al. (2020) show that in a model with endogenous sovereign risk, the optimal fiscal plan (which fiscal rules should try to implement) features a more ambitious fiscal consolidation when fiscal risk is higher. Sublet (2023) shows that the optimal fiscal rule features a gradual schedule of tighter adjustments when the tail risks are larger.[4]

However, in the 2025 IMF Fiscal Rules Dataset, of more than 120 countries with fiscal rules, only six are identified as implementing pre-emptive robust correction mechanisms (Alonso et al., 2025): Armenia, Costa Rica, Cyprus, Czech Republic, Poland, and Slovakia. Figure 1 presents a brief description of fiscal rules in these countries.[5] For example, in Costa Rica, the correction mechanism establishes limits to the growth of expenditures as a function of GDP growth over the previous four years, with lower limits to expenditure growth for higher debt levels. Furthermore, if debt exceeds 60% of GDP, the limit applies to total expenditure, and the rule also prescribes a limit to the indexation of pensions

[3] Of course, other fiscal rule characteristics are important to improve compliance and the performance of fiscal rules. For example, narrow coverage (e.g., limiting only the central government) and exclusions (e.g., excluding capital expenses) often limit the extent to which fiscal rules impose fiscal discipline. Poor calibration of the fiscal anchor could also damage the government's willingness to comply with the rule (Blanchard and Zettelmeyer, 2023; Hatchondo et al., 2022a,b). Strong medium-term fiscal frameworks and institutions for fiscal oversight (including independent fiscal councils; Alonso et al., 2025) could also improve compliance.

[4] There may be important lessons from monetary policy that could apply to managing fiscal risks (Leeper, 2010). Fiscal rules with a clear fiscal anchor and a robust correction mechanism and a stronger fiscal response when risk is higher (i.e., when the deviation from the target is larger) resemble Taylor rules in monetary policy.

[5] In July 2024, Poland's stabilizing expenditure rule (SER) was amended, introducing changes concerning, among other things, the correction mechanism and the triggers activating the escape clause. The SER expenditure for the next year is calculated on the basis of the formula contained in the Public Finance Act (Article 112aa (1)). Furthermore, from 1 January 2026, the Minister of Finance will be able to request the Fiscal Council to issue an opinion on the size of the fiscal adjustment and its impact on the long-term stability of public finances and the macroeconomic situation of the country.

and public sector salaries.[6]

1.2 The Cost of Fiscal Risk

We focus on the effect of fiscal rules on fiscal risk (reflected in sovereign spreads) because fiscal risk has been found to be very costly.[7] Arellano et al. (2023) find that that a 100 bps increase in sovereign spreads leads to a 60 bps increase in firm borrowing cost, which in turn lowers GDP. For example, they argue that in the 2012 crisis, real GDP in Italy would have fallen 3.1% instead of 6.3% if sovereign spreads had not increased.[8] Furthermore, the countercyclicality of sovereign spreads has been linked to increased volatility in economies facing fiscal risk, in part because higher borrowing costs in bad times lead to procyclical fiscal policy (Bianchi et al., 2023; Cuadra et al., 2010; Neumeyer and Perri, 2005). Figure 2 illustrates how economies with more sovereign risk may have weaker access to debt markets after adverse shocks: The sovereign spread in 2019 is positively correlated with the spread increase in 2020 (owing in part to COVID-19).[9]

If fiscal risk is so costly, why do governments choose to live with significant fiscal risk? This may be due to deficit bias, which in turn can be explained by political myopia (Aguiar et al., 2020; Azzimonti, 2011; Halac and Yared, 2014, 2018) or time inconsistency problems (Chari and Kehoe, 2007; Hatchondo et al., 2020). In quantitative models, this

[6]While the fiscal rule in Costa Rica does not directly limit the fiscal balances or anchor debt levels, it seems unlikely that the government would implement discretionary measures to lower this balance (e.g., lowering taxes) while complying with the limits imposed by the rule. However, cyclical factors leading to reductions in tax revenue collection could weaken fiscal balances and increase debt levels while complying with the fiscal rule. That said, additional measures to reduce debt and avoid the limits imposed by the rule as it gets more stringent could be expected, since when the unpopularity of the pension and salary increase limits could provide political incentives to avoid high debt levels.

[7]An agreement on the gains from committing to low fiscal risk with fiscal rules could be achieved independently from other important fiscal policy debates including on income redistribution and the size of the government. Any agreed level of government expense, as long as it is sufficiently financed with revenues, should not affect fiscal risk significantly (especially with a robust correction mechanism that guarantees a response to fiscal risk increases). At the same time, it should be noticed that reducing fiscal risk could help achieve other objectives of fiscal policy (e.g., macroeconomic stabilization, reduced poverty, stronger development and equity).

[8]Balke (2023) and Roldán (2025) also discuss the real costs of sovereign risk.

[9]Figure 2 also illustrates the mixed performance of fiscal rules: Several countries with fiscal rules face significant fiscal risk (measured with sovereign spreads), and it is not obvious whether fiscal rules helped mitigate the increase in fiscal risk after COVID-19. The mixed performance of fiscal rules has been associated with poor compliance with these rules (Caselli and Wingender, 2021; Eyraud et al., 2017; Gaspar and Amaglobeli, 2019; Larch and Santacroce, 2020; Larch et al., 2023; Larch and van der Wielen, 2024; Reuter, 2019; Ulloa-Suárez, 2023; Ulloa-Suárez and Valencia, 2022). Weak compliance and the resulting poor performance of some fiscal rules have been attributed to poor design (Blanchard and Zettelmeyer, 2023; Caselli and Reynaud, 2020). Robust correction mechanisms could improve compliance and thus the overall performance of fiscal rules.

Country	Armenia	Costa Rica	Cyprus	Czech Republic	Poland	Slovak Republic
FRRC Approval	**11-23-2017**	**12-03-2018**	**02-21-2014**	**01-06-2017**	**08-27-2009**	**12-08-2011**
Correction Mechanisms for different levels of the debt to GDP ratio	• Debt above 40%: Overall deficit should not be greater than capital expenditures. • 50-60%: In addition to the above, the growth rate of primary current expenditures is capped at the average nominal GDP growth of the previous 7 years. The government must introduce a debt reduction program. • Above 60%: In addition to the above, the growth of primary current expenditures is capped at the average nominal GDP growth of the previous 7 years minus 0.5 percentage points. Current expenditures are capped by the anticipated tax revenues, and the government must submit a debt reduction plan to parliament.	• The growth in current expenditures as a percentage of the average GDP growth over the previous four years must be: • Debt below 30%: 100%. • 30-45%: 85%. This limit also applies if real GDP growth exceeds 6 percent for two consecutive years, or current expenditures are more than 17% of GDP. • 45-60%: 75%. • Above 60%: 65%. The limit applies to total expenditure. In addition, there are no pension increases except for cost of living, there are no increases in the public sector base salaries or other salary incentives, and there are no transfers of public resources to the productive sector.	• Debt above 60% or deviation of more than 0.5 percent of GDP from the medium-term adjustment path towards 60%: Corrective measures must be implemented immediately, with focus on expenditures.	• Debt above 55%: the government must submit a new budget proposal and medium-term fiscal outlook consistent with long-term sustainability to parliament. • Above 60%: the government is required to propose concrete measures to reduce debt. The framework also restrains expenditures to cyclically adjusted revenues.	• Debt between 55-60%: Budget law that implies a reduction of the debt-to-GDP ratio at the end of the year. Remuneration of the employees covered by the State Budget shall not increase. The adjustment to pensions shall not exceed the CPI inflation of the previous year. The government may review the provision system to increase revenues, including possible changes to tax rates on goods and services. • Above 60%: In addition to the above, within a month, the government must present to Parliament a program designed to bring the debt under 60%. The expenditure of local governments for the following year shall not be higher than its revenues. In addition, a mandatory correction of 2 percentage points in expenditure per year is required when the deficit in the previous period exceeded 3% of GDP.	• Debt between 50-53%: Propose measures to reduce debt. • 53-55%: Propose measures to reduce debt and freeze wages of government officials. • 55-57%: In addition to the above, expenditures are cut by 3% and next year's expenditures are frozen, except for interest payments. • 57-60%: In addition to the above, the government should submit a balanced budget. • Above 60%: In addition to the above, the cabinet will face a confidence vote in parliament. Starting in 2018, these debt thresholds were set to decline by one percentage point per year, until 2027.
Triggers for activating escape clauses	Large scale disasters, warfare, and negative economic developments owing to economic shocks.	Declaration of National Emergency, GDP growth expected to be less than 1 percent. Escape clauses have maximum period is 2 years.	None.	Severe economic slowdown, war, natural disaster or outlays related to international agreements with an estimated cost higher than 3 percent of GDP.	Martial law, state of Emergency, natural disaster.	Major recession, banking system bailout, natural disaster, state of war.

Figure 1 Fiscal Rules with Robust Correction Mechanisms (FRRC)

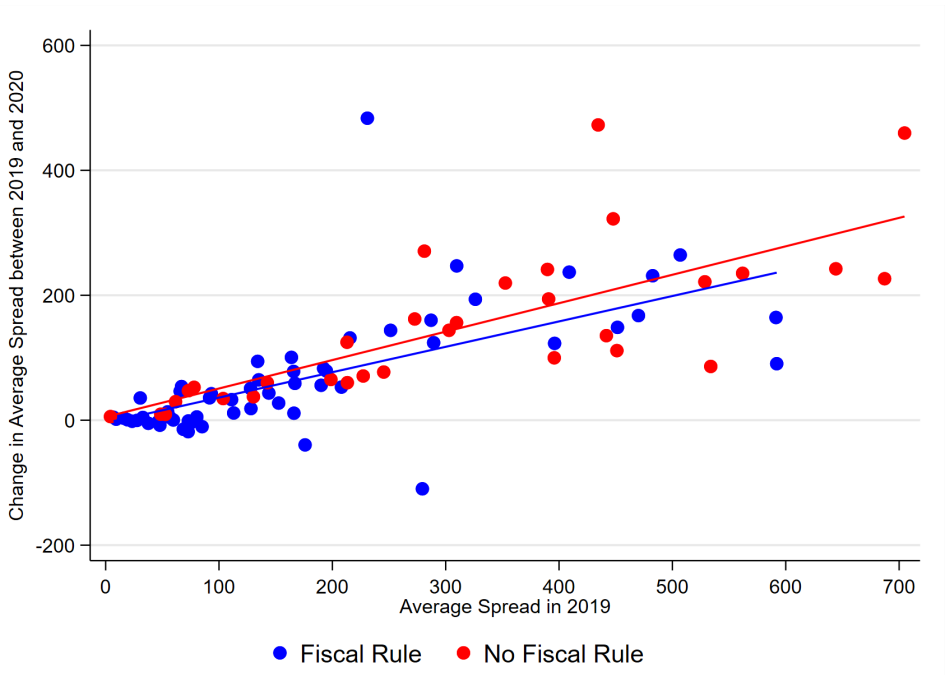

Figure 2 Fiscal Risk Increase during COVID-19

NOTE. Spreads are presented in basis points. The figure excludes outliers (countries with either average spread in 2019 higher than 800 or a change in average spread in 2020 higher than 600). Source: IMF Sovereign Spread Monitor.

deficit bias has been shown to be essential to account for high level of sovereign spreads in the data (Chatterjee and Eyigungor, 2012; Hatchondo and Martinez, 2009).

1.3 Related Empirical Literature

We build on the large empirical literature studying the impact of fiscal rules on sovereign spreads. Capraru et al. (2025) find that in the European Union, fiscal rules and compliance with fiscal rules reduce sovereign spreads. Iara and Wolff (2014) find that within the euro area, stronger national fiscal rules in member states reduce sovereign spreads. Kalan et al. (2018) study the impact of non-compliance with fiscal rules on sovereign spreads within the European Union. They find that for countries that have been placed under an Excessive Deficit Procedure, spreads are on average 50-150 basis points higher than spreads for countries that have not. Feld et al. (2017) study sub-national fiscal rules in Switzerland and find that strong and credible balanced budget rules reduce risk premia. Islamaj et al. (2024) find that the presence of fiscal rules is statistically significantly associated with lower sovereign spreads during the COVID-19 crisis.

A more recent strand of the literature uses synthetic control methods to estimate the

impact of different policy interventions on sovereign spreads. Lang et al. (2023) shows that countries eligible for official debt relief through the Debt Service Suspension Initiative experienced a larger decline in borrowing costs compared to similar ineligible countries. Ulloa-Suarez et al. (2025) finds that the activation of escape clauses in fiscal rules reduced debt levels and sovereign spreads (Figure 1 presents the triggers for escape clauses in the fiscal rules we study).

The rest of the paper is organized as follows. Section 2 discusses the data we use for the empirical analysis. Sections 3 and 4 present the results for the synthetic control and panel regressions, respectively. Section 5 concludes.

2 Data

For data on fiscal rules, we use the 2025 update of the IMF Fiscal Rules Dataset (Alonso et al., 2025). For sovereign spreads, whenever possible, we use the IMF Sovereign Spread Monitor (SSM)[10]. We use weekly data on sovereign bond spreads from April 27, 2012, to November 3, 2023, for all available countries. For Poland and Slovakia, SSM spreads are not available when they introduce the rule, and we use CDS spreads.[11] For our robustness analysis and panel regressions in Section 4, we use five key macroeconomic indicators (public debt over GDP, real GDP growth, reserves over GDP, and fiscal and current account balances) at the annual frequency from the IMF World Economic Outlook.

Figure 3 shows how fiscal risk (measured by sovereign spread) decreased in countries that adopted FRRC.[12] The figure also shows that fiscal risk continued to decline years

[10]For each country, the SSM provides a par-value weighted spread across all bonds that meet the following criteria: a) Are issued under foreign governing law (generally UK or NY law), or by euro area members under domestic law; b) are USD or euro-denominated; c) have fixed rate or step coupons; d) have an amount outstanding greater or equal than USD/Euro 250 million; e) are bullet maturities or amortizing bonds; f) have minimum pricing quality; g) have at least one year remaining maturity for bullet bonds, or 18 months for amortizing bonds; h) are not covered by external guarantees. USD-denominated bonds are underlying the spread curves for the majority of countries, with those spreads calculated over U.S. Treasury yields. For spread curves based on euro-denominated bonds, spreads are calculated over German government yields.

[11]CDS spreads are not available for Costa Rica and Cyprus. For the six cases we focus on, the commonly used EMBI spread is only available for Costa Rica and Poland when they introduce the rule.

[12]In the case of Armenia, the spread decline started before the rule was approved. This may be due in part to anticipation of the rule approval and the implementation of measures that would facilitate compliance with the rule even before the rule was approved. Armenia also used the escape clause of the fiscal rule in 2020-21, as the debt surpassed the 60 percent of GDP threshold while the country faced COVID-19 and the 2020 war (Figure 1 presents the triggers to activate the escape clauses for the six cases under study). In Section 3, using synthetic controls, we find a significant effect of the rule's approval in Armenia's fiscal risk.

after the rule was introduced. This is not surprising since markets are likely to learn over time about the credibility of the rules and governments may adopt complementary measures to improve the effectiveness of the rules.

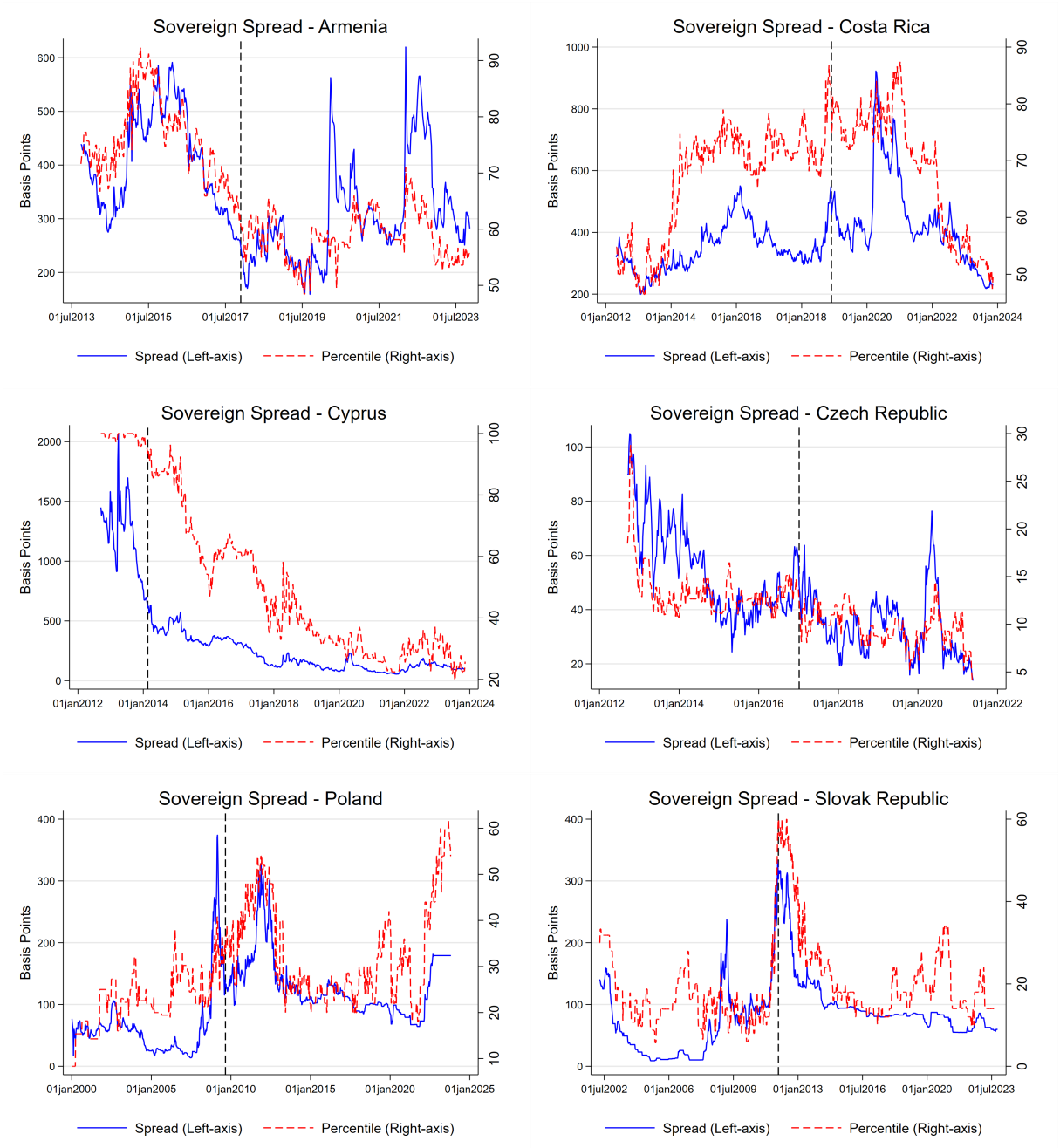

Figure 3 Fiscal Risk

NOTE. The panels present the sovereign spread and the implied percentile in the distribution of sovereign spreads across countries. The vertical line marks the date in which Congress approved the FRRC. For Poland and Slovakia, spreads from the IMF Sovereign Spread Monitor (SSM) are not available when they introduce the rule, and we use CDS spreads. Source: IMF SSM.

Figure 3 also shows that fiscal rules improve the relative position of these countries in the distribution of sovereign spreads, indicating that the reduction in spread in these countries cannot be solely attributed to global factors. For example, in the case of Costa Rica, when the rule was approved in December 2018, the spread was more than 500 basis points. After the rule approval, the spread decreased about 150 basis points, but it increased again to more than 900 basis points with COVID-19. At the end of 2020, the spread started to decline again and is now about 200 basis points.[13] In the distribution of sovereign spreads across countries, Costa Rica was in the 80th percentile when the rule was approved, close to the 70th percentile soon after that, went over the 85th percentile after COVID-19, and it is now below the 50th percentile.

3 Synthetic Controls

The synthetic control methodology (Abadie and Gardeazabal 2003; Abadie et al. 2010; Abadie et al. 2015) is a data-driven approach to small-sample comparative case studies for estimating treatment effects. This section uses synthetic control methods (SCs) to evaluate the effect of the introduction of fiscal rules with robust correction mechanism (FRRC) on sovereign spreads. SCs exploits the differences in treated and untreated units (the donor pool) across the event of interest and generates a weighted average of the untreated units that closely matches the treated unit over the pre-treatment period. Outcomes for this synthetic control are then projected into the post-treatment period using the weights identified from the pretreatment comparison. This projection is used as the counterfactual for the treated unit. The effect of the treatment, the introduction of a FRRC, is computed by taking the difference between the spread outcome for our treated country and its counterfactual. Inference is then conducted using placebo tests. We describe our methodology and our results below.

3.1 Methodology

Estimation. Following the notation presented in Abadie (2021), the treated country is the first unit ($c = 1$); the donor pool is the set of potential comparisons, $c = 2, \ldots, C+1$. Let Y_{ct} be the outcome variable (i.e., sovereign spreads). The SC estimator of τ_{1t} (i.e.,

[13] Of course, as mentioned before, other measures may support the effect of fiscal rules on fiscal risk. For example, in April 2020, an IMF RFI program with Costa Rica was approved, followed by an EFF in March 2021 and an RSF in November 2022. David et al. (2022) find evidence of IMF-supported programs improving the credibility of fiscal consolidation plans.

the treatment effect on the treated country $c = 1$ at time t) is then estimated by:

$$\hat{\tau}_{1,t} = Y_{1,t} - \sum_{c=2}^{C+1} w_c Y_{c,t}, \tag{1}$$

where the weights, $\mathbf{W} = (w_2, \ldots, w_{C+1})'$, are restricted to sum to one and to be nonnegative. These weights are chosen to minimize:

$$\|\mathbf{X}_1 - \mathbf{X}_0\mathbf{W}\| = \left(\sum_{h=1}^{k} v_h \left(X_{h1} - w_2 X_{h2} - \ldots - w_{C+1} X_{hC+1} \right)^2 \right)^{1/2}.$$

Minimizing this expression ensures that the SC best resembles the preintervention values of the outcome predictors for the treated unit ($\mathbf{X}_1$). The matrix $\mathbf{X}_0 = [\mathbf{X}_2 \ldots \mathbf{X}_{C+1}]$ collects the values of the predictors for the untreated units. $\mathbf{X}$ may include pre-intervention values of the outcome, Y. The positive constants, $v_1, \ldots, v_k$, reflect the relative importance of the k predictors $X_{11}, \ldots, X_{k1}$ for predicting Y_{1t}.

Following Cavallo et al. (2013), the estimated average effect for the introduction at T_0 of a FRRC on sovereign spreads across our $G = 6$ case studies is given by:

$$\bar{\tau} \equiv \left(\bar{\tau}_{g,T_{0+1}}, ..., \bar{\tau}_{g,T} \right) = \frac{1}{G} \sum_{g=1}^{G} \left(\hat{\tau}_{g,T_{0+1}}, ..., \hat{\tau}_{g,T} \right). \tag{2}$$

Inference. After estimating the individual and average effects, we determine statistical significance by running placebo tests. As in classical permutation tests, we apply the synthetic control method to every potential control in our sample (Abadie et al. 2010). This allows us to assess whether the effect estimated by the synthetic control for the countries introducing the FRRC is large relative to the effect estimated for a country chosen at random. If the distribution of placebo effects yields many effects as large as the main estimate, then it is likely that the estimated effect was observed by chance. We compute the significance level for the individually estimated impact as:

$$\text{p-value}_{g,t} = Pr\left(\hat{\tau}_{g,t}^{PL} < \hat{\tau}_{g,t} \right). \tag{3}$$

The extension by Cavallo et al. (2013) allows for more than one unit to experience treatment and at possibly different times, and provides tests for inference. To conduct valid inference for the average effect $\bar{\tau}$ we need to account for the fact that the average smooths out some noise. We compute the significance level for the average estimated

impact as:

$$\text{p-value}_{G,t} = Pr\left(\frac{1}{G}\sum_{g=1}^{G}\hat{\tau}_{g,t}^{PL} < \bar{\tau}\right) = Pr\left(\bar{\tau}_t^{PL} < \bar{\tau}_t\right). \tag{4}$$

Model Specification. For our six case studies, the baseline treatment is the approval by Congress of the fiscal rule as described in Figure 1. In our baseline, we consider for the donor pool all countries with available data on sovereign bond spreads that did not have spreads greater than 4,000 basis points at any point during the studied window (we later discuss the robustness of the results to considering a lower limit). This eliminates countries that had severe debt distress and thus are less relevant for our analysis. We would not want our results on the spread reduction triggered by the introduction of the fiscal rule to be biased by one of the countries in the donor pool suffering an unanticipated debt crisis in the post-treatment period. In our baseline, synthetic countries are constructed using a set of pretreatment characteristics that only includes the value of sovereign spreads on seven specific dates before the approval of the rule that correspond to the last weekly spread and the previous six month-end weekly spreads, thereby minimizing the risk of cherry-picking the set of predictors used in the SC (Ferman et al. 2020). As a robustness check to address potential over-fitting concerns, we also construct SCs using a set of pre-treatment characteristics that include standard macroeconomic spread determinants (GDP growth, public debt, fiscal balance, current account balance, and international reserves) in addition to the lagged values of the sovereign spread (Lang et al. 2023). We show later that this does not change our main results.

3.2 Results

In reporting our results, we closely follow the approaches in Lang et al. (2023), which focuses on high-frequency spread responses across multiple countries following a common treatment, and Cavallo et al. (2013), which studies multiple events with different treatment times. This combination is particularly suited for our analysis of high-frequency spread responses across multiple countries with different treatment times.

Main Results. Table A1 reports the weights used to construct the synthetic control group for each treated country. Figure 4 reports the mean, as defined in equation (2), median, and inter-quartile range of the 12-week moving average of the difference between the actual log sovereign bond spreads and those of the respective synthetic control (the

spread gap) around the treatment date.[14] In the months before treatment (i.e., before the rule is approved by Congress), the spread gap is close to zero, meaning that our treated countries do not systematically differ from their counterfactual before the treatment. After treatment, the gap starts to decrease, with the median gap stabilizing around -25% after one year. This translates into -75 basis points (bps) for the average economy in our sample of treated countries, which had a spread of 300 bps prior the to treatment.

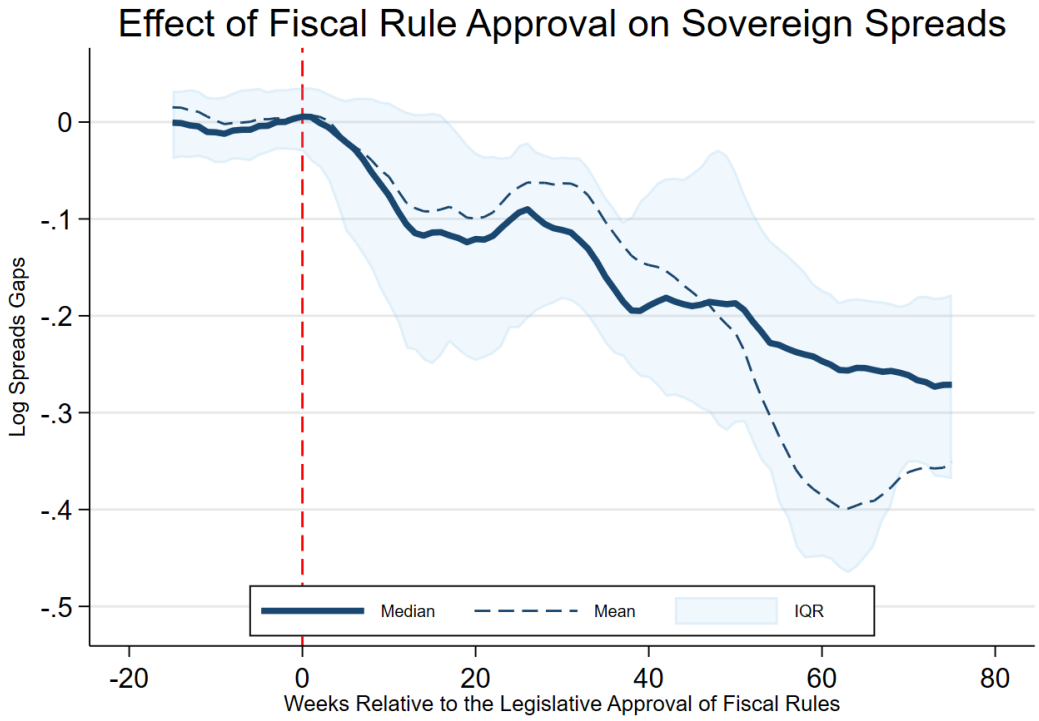

Figure 4 Pooled Sovereign Spreads Gaps (Basis Points in Logarithms)

NOTE. The chart shows the mean (dashed line), median (solid line) and inter-quartile range (shaded area) of the log spread (12-week moving average) difference between countries with a FRRC (Armenia, Costa Rica, Cyprus, Czech Republic, Poland, and Slovak Republic) and their respective synthetic control group.

Figure 5 presents the log spread for each of the six countries with a FRRC and their counterfactual, i.e., the two components on the right-hand side in equation (1). In all cases, the FRRC appears to have triggered a significant and persistent spread decline rel-

[14]We match each country with its synthetic counterpart using the path of its spread. Therefore, the estimated country-specific effect of the introduction of the fiscal rule with robust correction mechanism is measured as the difference in the actual and counterfactual evolution of the spread. The size of the effect will depend on the level of the spread. The same decline in the spread is more important in a country with a lower initial spread. Given these scale effects we need to normalize the estimates before pooling the country-specific results. We normalize throughout the paper by taking the log of the spread, so that log differences can naturally be compared across countries.

ative to the counterfactual. The figure shows that after the FRRC approval, this spread decline is often not immediate. As mentioned before, this is not surprising, as markets may need to continue learning about the governments' commitment to the rule after its approval, and additional measures may be introduced to complement the rules. For example, Figure 5 shows that in the Slovak Republic (bottom right panel), the approval of the rule did not immediately stop the increase in the spread gap. But this gap started to decrease after the rule entered into force in March 2012. Figure 5 also shows that the gap increased for Costa Rica (top right panel) with COVID-19. In Cyprus (middle left panel), the sovereign spreads were already declining before the approval of the rule, suggesting some market anticipation of this approval.

Inference. After estimating the effect, we determine statistical significance by running placebo tests. To test whether the decreasing spread gap in Figure 4 can be attributed to the approval of the fiscal rules, we perform a placebo test in which we sequentially "reassign" the treatment to each donor pool country and estimate a fictitious SC using the remaining donor countries and the originally treated unit (Abadie et al. 2010). Following Cavallo et al. (2013), when computing placebo averages, we refine our inference approach and include only the averages computed with placebos for which we obtained as good a pretreatment fit as the country that they serve as control for. As can be seen from equation (4), the methodology involves computing all the possible placebo average effect by picking a single placebo estimate corresponding to each event g and then taking the average across the G placebos. In our case, this would require computing more than 2,500,000,000 averages, which is computationally challenging[15]. Instead, we draw with replacement 10,000 placebo series for each event and take the average across all the 6 events for each draw, giving us 10,000 placebo average effects $\bar{\tau}_t^{PL}$.

Figure 6 reports the significance level for the average estimated effect, as defined in equation (4). The figure shows that the probability the estimated effects were obtained by chance is below 1 percent for most of the post-treatment sample, and especially after a year. The results become temporarily insignificant for about 4 weeks after the fifth month, but this is due to some high-frequency volatility in the spreads. The measure quickly reverts back to levels below the 5 and 1 percent thresholds. Overall, these results indicates strong evidence of the significance of the causal average effect of the FRRC approval on spread gaps.

[15]We compute 27 placebos for Armenia, 65 for Costa Rica, 65 for Cyprus, 44 for Czech Republic, 12 for Poland, and 42 for Slovak Republic.

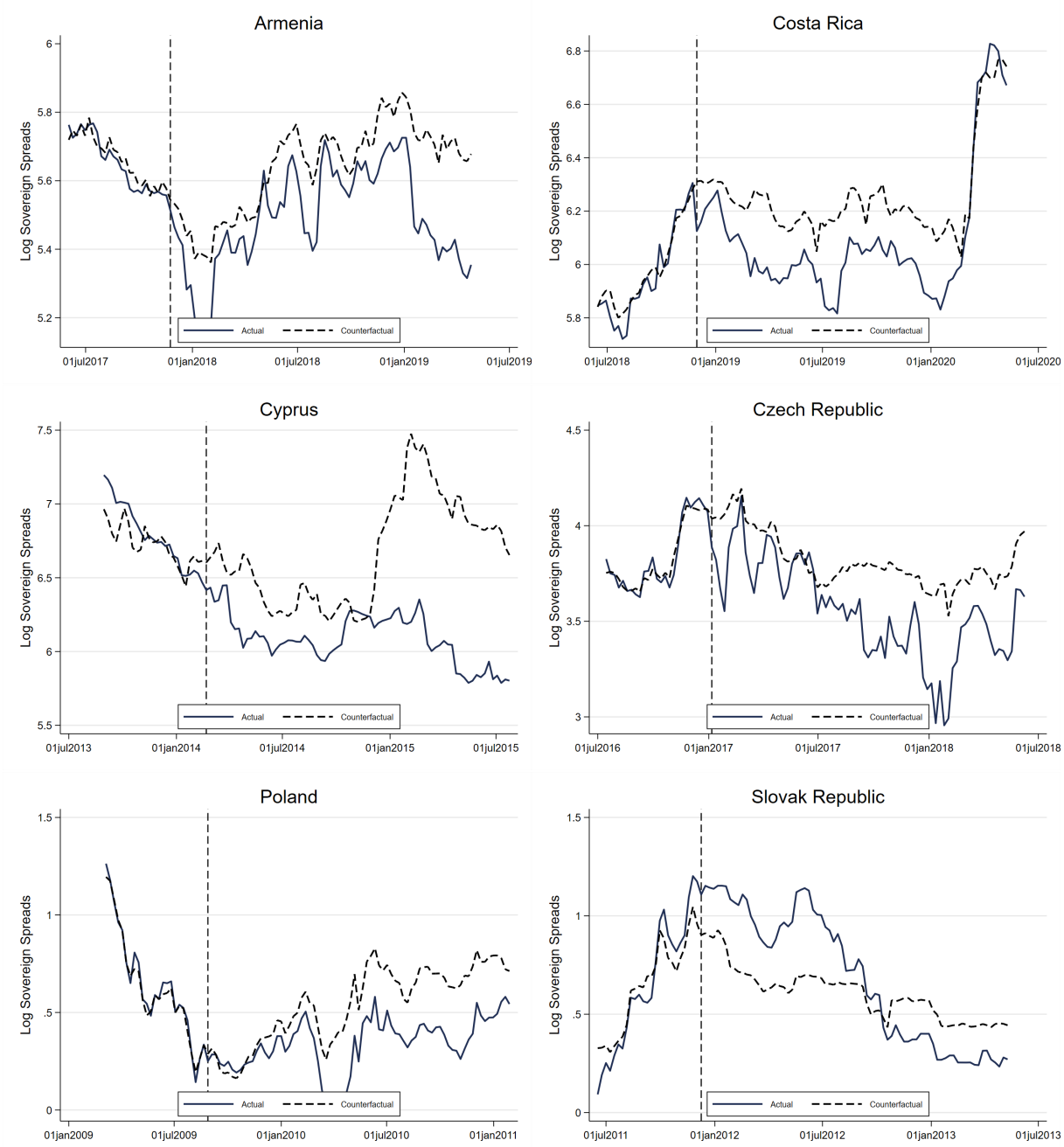

Figure 5 Single-Country Sovereign Spreads Gaps Against Synthetic Control (Basis Points in Logarithms)

NOTE. The chart plots, for each country, both actual sovereign bond spreads (solid line) and those of their respective synthetic control (dashed line). The legislative approval of the FRRC is the treatment and is indicated by the vertical line.

For each of the six countries that approved a FRRC, Table A2 reports the significance level for the country-specific estimated effect, as defined in equation (4), at four different post-treatment dates. Except for the Slovak Republic, the p-values provide evidence that the country-specific estimated effects are significant.

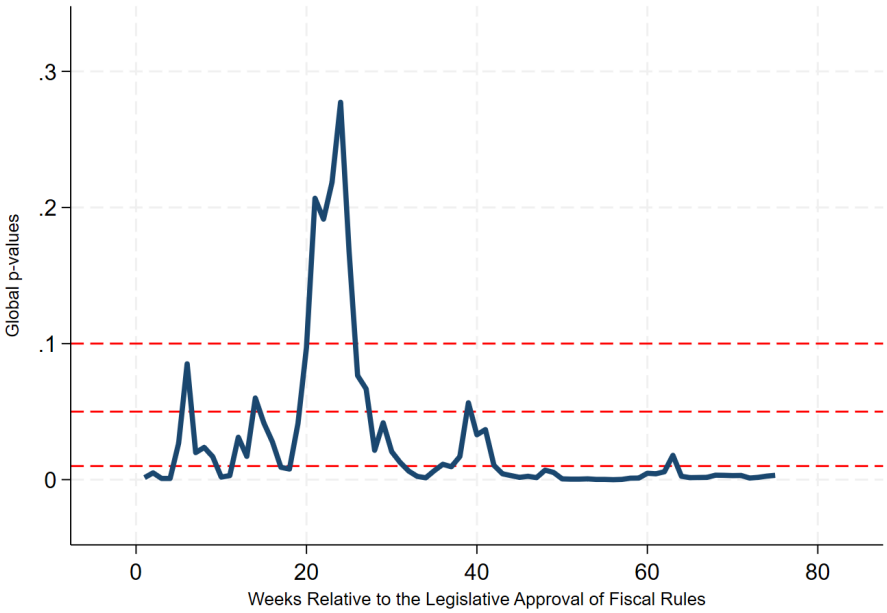

Figure 6 Probability the Estimated Effect is Obtained by Chance (Global p-value)

NOTE. The chart shows the global p-value defined in equation (4) and 3 significance levels at 1%, 5%, and 10% (horizontal red dashed lines) for all weeks after the treatment date.

Robustness Checks. Figure 7 illustrates the robustness of our results to changing some of our assumptions. The figure reports the median spread gap i) assuming that countries are matched based on pretreatment characteristics that includes standard macroeconomic variables (GDP growth, public debt, fiscal balance, current account balance, and international reserves) in addition to the sovereign spread (upper-left panel), ii) excluding countries with a spread greater than 1500 basis points at any point in time from the donor pool (upper-right panel), iii) only including countries with fiscal rules in the control group (lower-left panel) and iv) removing the country with the largest weight from the donor pool for each treated unit (lower-right panel). Spread differentials are somewhat lower under these assumptions, but still economically significant, with a median effect of around 20% after a year under alternatives i), ii), and iii) (i.e., not much lower than the 25% in our baseline exercise). The effect is smaller, around 10%, when removing the country with the largest weight from the donor pool. Yet, this comes with greater uncertainty as the fit of the synthetic control is reduced, especially for countries which adopted a FRRC relatively early as fewer comparable countries have available spread data and thus the size and quality of their donor pool is more constrained.

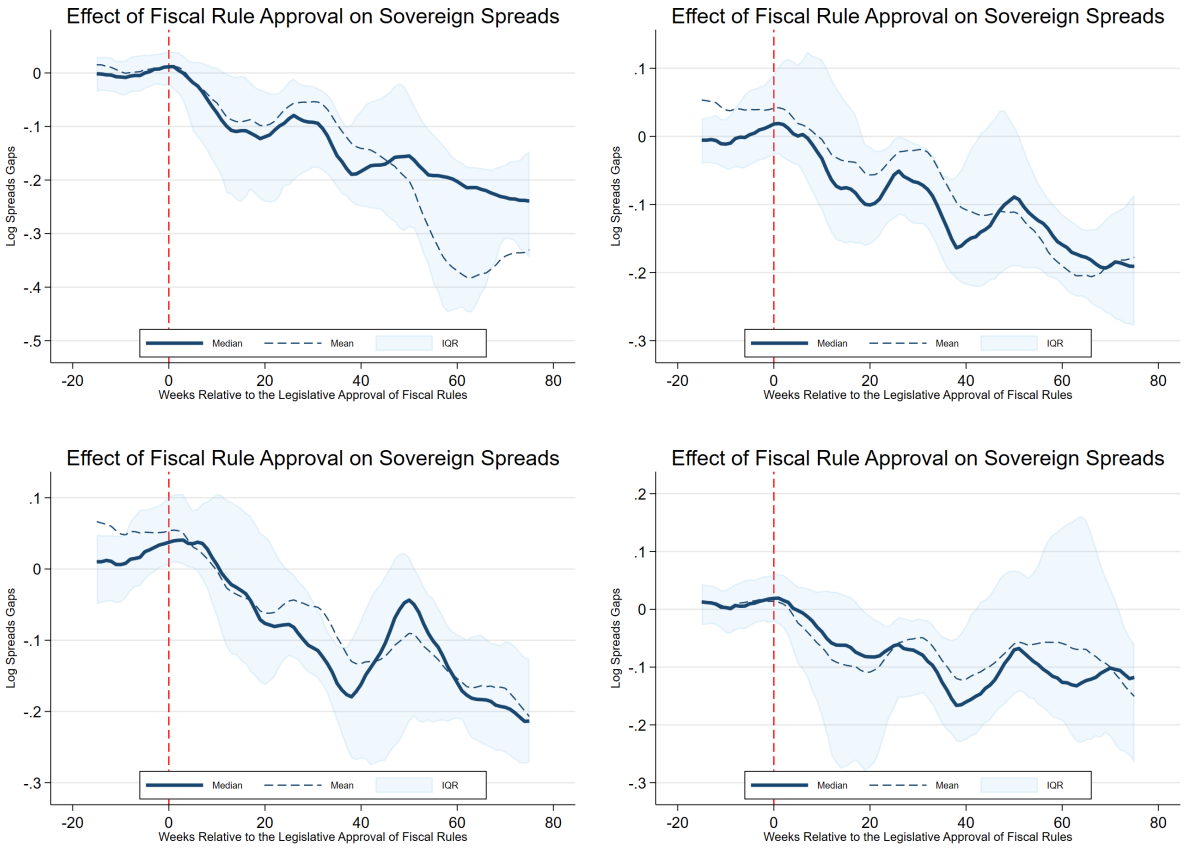

Figure 7 Robustness of Sovereign Spreads Gaps (basis points in logarithms)

NOTE. The chart shows the mean, median and inter-quartile range of the log spread (12-week moving average) difference between countries with a FRRC (Armenia, Costa Rica, Cyprus, Czech Republic, Poland, and Slovak Republic) and their respective synthetic control group, under alternative assumptions: including macro controls to select the control group (upper-left), imposing a lower limit to the maximum spread in the control group (upper-right), including only countries with fiscal rules in the control group (lower-left), and removing the country with the largest weight from the control group (lower-right).

Overall, the results from this section suggest quantitatively important, statistically significant, and robust effects from fiscal rules with robust correction mechanisms (FRRC) on sovereign spreads for more than a year after their introduction. Section 4 complements this analysis by studying the longer-term effects of FRRC on sovereign spreads.

4 Panel Regressions

This section investigates econometrically the relationship between the presence of a FRRC and fiscal risk measured with sovereign spread. Our empirical strategy builds upon the literature on the determinants of sovereign spreads (Hilscher and Nosbusch 2010, Heinemann et al. 2014, Iara and Wolff 2014). As the objective of our empirical analysis is to

compare levels of sovereign spreads for countries with a FRRC to countries without such a fiscal rule, the main modification is that we introduce a dummy variable that indicates when FRRC are in place into this otherwise standard model of spread determination.

4.1 Model Specification

Our baseline specification takes the following form:

$$s_{i,t} = \alpha + \beta s_{i,t-1} + \sum \beta_{\mathbf{j}} \mathbf{X_{i,t,j}} + \beta_{FR} FR_{i,t} + \beta_{FRRC} FRRC_{i,t} + \gamma_i + \eta_t + \epsilon_{i,t}, \quad (5)$$

where for country i at time t, $s_{i,t}$ denotes the logged SSM sovereign spread, the set of country-specific macroeconomic controls is denoted by $\mathbf{X_{i,t}}$, γ_i denotes country fixed effects, η_t denotes time specific controls, and $FR_{i,t}$ and $FRRC_{i,t}$ are dummies for the presence of a fiscal rule without and with a robust correction mechanism, respectively. Note that FRRC is a subset of FR. Thus, for the six countries with FRRC, the two dummies are equal to one after the legislative approval of the FRRC.

The benchmark model is estimated for a panel of 99 countries over the period 2012-2023. The estimation is on an annual basis, which filters the noise from large variations in financial markets. Drawing from the literature on determinants of sovereign spreads, the following macroeconomic variables are included as country-specific controls: GDP growth, debt-GDP ratio, primary balance-GDP ratio, reserves-GDP ratio, and current account-GDP ratio (Lang et al. 2023). Since markets react to contemporaneous available information, we use current values for flow variables (GDP growth, primary balance-GDP ratio, and current account-GDP ratio) and lagged values for the stock variables (debt-GDP ratio and reserves-GDP ratio). Including all variables with their lagged value does not change our results. In all specifications, we include the lagged spread as an additional control given the persistence in its process. We also include as controls two global factors that are common drivers of global rates (VIX and U.S. Federal Fund Rate).

In a dynamic specification, the presence of the lag of the dependent variable might introduce an endogeneity bias. A System Generalized Method of Moments (SGMM) estimator shows a lower bias and higher efficiency than other typical estimators, including widely used fixed effect and first-differences GMM estimators (Iara and Wolff 2014). Following Kalan et al. (2018), we estimate a dynamic panel regression using a SGMM estimator. Our SGMM is implemented using Roodman's procedure (Roodman 2009). We model the following variables as strictly exogenous covariates: GDP growth, lagged reserves-GDP ratio, current account-GDP ratio, the VIX and the U.S. Federal Fund Rate,

and the dummies for the presence of a fiscal rule without and with a robust correction mechanism. We further treat as predetermined variables the lagged spread and debt-GDP, based on the fact that they are potentially correlated with past errors (so these are instrumented GMM-style using first lag and deeper). We consider as endogenous variable the primary balance-GDP ratio as this variable is potentially correlated with present errors (so this is instrumented GMM-style using second lag and deeper). Further specification choices key to SGMM include lag length, applied transformation, and finite-sample correction. With GMM with a T of up to 12, the number of instruments could be very large (quadratic in T), which makes it necessary to reduce the number of instruments by restricting the number of lags. We specify that only lags 2–4 are used in the construction of the GMM instruments. In terms of transformation, our preferred specification uses the forward orthogonal deviations (FOD) transformation and makes the finite-sample correction to the two-step covariance matrix proposed by Windmeijer (2005). To avoid the concern of overfitting the instruments, we also report a parsimonious specification which only controls for the growth rate and the current account balance ratio, which are the two statistically significant controls in our full specification. Finally, in all regressions, we exclude countries with spreads greater than 4,000 basis points at any time.[16]

4.2 Results

Our results are reported in Table 1. The OLS results are presented in columns (1) to (3) and the SGMM results in columns (4)-(11). The AR(1) and AR(2) results confirm the validity to use GMM, as residuals are autocorrelated in the first but not in the second lag. To avoid over-specification in the GMM models, we have collapsed the matrix of instruments and restricted the set of internal instruments. The Hansen test confirms that the instruments as groups are exogenous in both our parsimonious specifications and in our full specification with time-fixed effects.

[16]The outliers are Belarus, Ecuador, Ethiopia, Lebanon, Pakistan, Russia, Sri Lanka, Tunisia, Ukraine and Zambia.

Table 1 Panel Regressions - Fiscal Rule Impact on Sovereign Spreads

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Dependent variable: ln(spread)	OLS			GMM-IV							
Fiscal Rule Dummy	-0.159**		-0.166**	-0.111*		-0.069		-0.077		-0.103*	
	[0.069]		[0.068]	[0.056]		[0.048]		[0.055]		[0.056]	
Robust Correction Mechanism Dummy		-0.215**	-0.224**	-0.157**	-0.182***	-0.118**	-0.138***	-0.142***	-0.157***	-0.120**	-0.141***
		[0.099]	[0.100]	[0.065]	[0.068]	[0.050]	[0.049]	[0.050]	[0.052]	[0.050]	[0.052]
Growth Rate	-0.013***	-0.013***	-0.013***	-0.022***	-0.022***	-0.005	-0.004	-0.011***	-0.012***	-0.008**	-0.008**
	[0.003]	[0.003]	[0.003]	[0.004]	[0.004]	[0.004]	[0.004]	[0.003]	[0.003]	[0.004]	[0.004]
Current Account-GDP	-0.012***	-0.012***	-0.012***	-0.025***	-0.024***	-0.013***	-0.013***	-0.014***	-0.014***	-0.015***	-0.014***
	[0.003]	[0.003]	[0.003]	[0.006]	[0.006]	[0.004]	[0.003]	[0.004]	[0.003]	[0.004]	[0.003]
Lagged Debt-GDP	-0.002	-0.002	-0.002	0.000	0.000	0.002	0.002				
	[0.001]	[0.001]	[0.001]	[0.002]	[0.002]	[0.002]	[0.002]				
Primary Balance-GDP	0.006	0.006	0.007	0.041**	0.041**	-0.004	-0.006				
	[0.004]	[0.004]	[0.004]	[0.016]	[0.017]	[0.011]	[0.011]				
Lagged Reserves-GDP	-0.003	-0.002	-0.002	-0.001	-0.001	0.002	0.002				
	[0.002]	[0.003]	[0.003]	[0.002]	[0.002]	[0.002]	[0.002]				
VIX	0.023***	0.023***	0.023***	0.032***	0.032***			0.025***	0.025***		
	[0.003]	[0.003]	[0.003]	[0.004]	[0.004]			[0.002]	[0.002]		
Federal Fund Rate	0.052***	0.052***	0.052***	0.050**	0.053**			0.084***	0.086***		
	[0.016]	[0.015]	[0.015]	[0.023]	[0.024]			[0.011]	[0.012]		
Lagged ln(spread)	0.674***	0.670***	0.665***	0.890***	0.917***	0.884***	0.892***	0.886***	0.902***	0.865***	0.885***
	[0.049]	[0.048]	[0.049]	[0.056]	[0.052]	[0.041]	[0.037]	[0.079]	[0.071]	[0.068]	[0.060]
Constant	1.487***	1.394***	1.516***	0.107	-0.106	0.127	0.017	0.122	-0.007	0.493	0.320
	[0.260]	[0.246]	[0.257]	[0.296]	[0.257]	[0.248]	[0.208]	[0.452]	[0.383]	[0.395]	[0.320]
Observations	776	776	776	777	777	777	777	777	777	777	777
# Countries	89	89	89	89	89	89	89	89	89	89	89
R-squared	0.948	0.949	0.949								
R2_within	0.454	0.454	0.458								
Country FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	NO	NO	NO	NO	NO	YES	YES	NO	NO	YES	YES
# Instruments				18	17	25	24	10	9	17	16
AR(1) p-value				0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
AR(2) p-value				0.195	0.212	0.460	0.456	0.145	0.151	0.480	0.490
Hansen p-value				0.000	0.000	0.397	0.453	0.643	0.670	0.601	0.603

(1)-(3): OLS regressions estimations with robust standard errors.
(4)-(11): System GMM two-step robust estimations with the Windmeijer finite-sample correction.

The estimation results are in line with the previous literature using similar models of spread determination. Lower growth rates, higher current account deficits, higher global uncertainty, and higher global interest rates put upward pressure on spreads. The lagged levels of debt and reserves are not significant.

In both the OLS and GMM estimations, the FRRC dummy is negative and significant. The results are more nuanced for the FR dummy. This confirms that FRRCs have an economically and statistically significant spread-compressing effect. The effect of the presence of a fiscal rule robust correction mechanism ranges from about 17% to 32% across our specifications. Focusing on our parsimonious specification with time fixed effects in column 10, we find that FRRCs are associated with a total long-run drop of about 20% in the sovereign spread (exp(-0.103-0.120) – 1 ≈ -20%). The marginal effect of the presence of a robust correction mechanism ranges from about 12% to 20% across our specifications, confirming that this characteristic leads to a stronger compression of fiscal risk than other fiscal rules. These results are consistent with our findings from the synthetic control analysis and show that FRRC have long-lasting effects on sovereign spreads.

5 Conclusions

Our empirical results show that the introduction of a fiscal rule with robust correction mechanisms (FRRC), advocated both by policy advice and economic theory, has contributed to a significant and long-lasting decline in sovereign spreads, reaching about 25%, or 75 basis points for the average country in our study, after one year. Of course, robust correction mechanisms do not make these rules perfect as other rule characteristics (including coverage and exclusions, a robust calibration of the fiscal anchor, and strong medium-term fiscal frameworks and institutions for fiscal oversight) are important for the performance of fiscal rules. Furthermore, after extraordinary shocks (such as COVID-19), discretion can be given on whether to apply the consolidation prescribed in a FRRC. This is often done through escape clauses (see, for example, the escape clauses described in Figure 1). It should also be emphasized that if sovereign spreads were used to measure fiscal risk and guide fiscal policy, the government should not always respond to high-frequency changes in spreads (Hatchondo et al., 2022a), which are known to be very volatile.

References

Abadie, A. (2021): "Using Synthetic Controls: Feasibility, Data Requirements, and Methodological Aspects," *Journal of Economic Literature*, 59, 391–425.

Abadie, A., A. Diamond, and J. Hainmueller (2010): "Synthetic Control Methods for Comparative Case Studies: Estimating the Effect of California's Tobacco Control Program," *Journal of the American statistical Association*, 105, 493–505.

——— (2015): "Comparative Politics and the Synthetic Control Method," *American Journal of Political Science*, 59, 495–510.

Abadie, A. and J. Gardeazabal (2003): "The Economic Costs of Conflict: A Case Study of the Basque Country," *American Economic Review*, 93, 113–132.

Aguiar, M., M. Amador, and S. Fourakis (2020): "On the Welfare Losses from External Sovereign Borrowing," *IMF Economic Review*, 68, 163–194.

Alonso, V., C. Arroyo, O. Aydin, V. Balasundharam, H. R. Davoodi, W. R. Lam, A. Nguyen, N. S. Ferro, G. Sher, and A. Solovyeva (2025): "Fiscal Rules at a Glance: An Update 1985-2024," *Fiscal Affairs Department, International Monetary Fund, Washington, D.C.*

Arellano, C., Y. Bai, and L. Bocola (2023): "Sovereign Default Risk and Firm Heterogeneity," Staff Report No. 547, Federal Reserve Bank of Minneapolis.

Azzimonti, M. (2011): "Barriers to Investment in Polarized Societies," *American Economic Review*, 101(5), 2182–2204.

Balke, N. (2023): "The Employment Cost of Sovereign Default," *University of Chicago, Becker Friedman Institute for Economics Working Paper No. 2023-55.*

Bianchi, J., P. Ottonello, and I. Presno (2023): "Fiscal Stimulus under Sovereign Risk," *Journal of Political Economy*, 131(9), 2289–2595.

Blanchard, O. and J. Zettelmeyer (2023): "Fixing Germany's fixes of the European Commission's fiscal governance proposal," *Bruegel Analysis.*

Bohn, H. (1998): "The behavior of U.S. public debt and deficits," *Q. J. Econ.*, 113(3), 949–963.

——— (2008): "The sustainability of fiscal policy in the United States," *Neck, R., Sturm, J.E. (Eds.), Sustainability of public debt. MIT Press, Cambridge, MA.*

Capraru, B., G. Georgescu, and N. Sprincean (2025): "Fiscal Rules, Indepen-

dent Fiscal Institutions and Sovereign Risk: Evidence From the European Union," *International Journal of Finance Economics*, 101(5), 2182–2204.

Caselli, F., H. Davoodi, M. H. R. Davoodi, C. Goncalves, M. G. H. Hong, A. Lagerborg, M. P. A. Medas, P. Medas, A. D. Nguyen, and J. Yoo (2022): *The Return to Fiscal Rules*, International Monetary Fund.

Caselli, F. and J. Reynaud (2020): "Do fiscal rules cause better fiscal balances? A new instrumental variable strategy," *European Journal of Political Economy*, 63.

Caselli, F. and P. Wingender (2021): "Heterogeneous effects of fiscal rules: The Maastricht fiscal criterion and the counterfactual distribution of government deficits," *European Economic Review*, 136.

Cavallo, E., S. Galiani, I. Noy, and J. Pantano (2013): "Catastrophic Natural Disasters and Economic Growth," *Review of Economics and Statistics*, 95, 1549–1561.

Chari, V. V. and P. J. Kehoe (2007): "On the need for fiscal constraints in a monetary union," *Journal of Monetary Economics*, 54, 2399–2408.

Chatterjee, S. and B. Eyigungor (2012): "Maturity, Indebtedness and Default Risk," *American Economic Review*, 102(6), 2674–2699.

Cuadra, G., J. M. Sánchez, and H. Sapriza (2010): "Fiscal policy and default risk in emerging markets," *Review of Economic Dynamics*, 13(2), 452–469.

David, A. C., J. Guajardo, and J. F. Yepez (2022): "The Rewards of Fiscal Consolidations: Sovereign Spreads and Confidence Effects," *Journal of International Money and Finance*, 123, 102602.

End, N. and G. H. Hong (2022): "Trust What You Hear: Policy Communication, Expectations, and Fiscal Credibility," IMF WP/22/36.

Eyraud, L., V. Gaspar, and T. Poghosyan (2017): "Fiscal Politics in the Euro Area," IMF WP/17/18.

Feld, L. P., A. Kalb, M.-D. Moessinger, and S. Osterloh (2017): "Sovereign Bond Market Reactions to no-bailout Clauses and Fiscal Rules–The Swiss Experience," *Journal of International Money and Finance*, 70, 319–343.

Ferman, B., C. Pinto, and V. Possebom (2020): "Cherry Picking With Synthetic Controls," *Journal of Policy Analysis and Management*, 39, 510–532.

Gaspar, V. and D. Amaglobeli (2019): "Fiscal Rules," SUERF Policy Note. Issue

No 60.

Halac, M. and P. Yared (2014): "Fiscal rules and discretion under persistent shocks," *Econometrica*, 82(5), 1557–1614.

——— (2018): "Fiscal Rules and Discretion in a World Economy," *American Economic Review*, 108(8), 2305–2334.

Hatchondo, J. C. and L. Martinez (2009): "Long-duration bonds and sovereign defaults," *Journal of International Economics*, 79, 117 – 125.

Hatchondo, J. C., L. Martinez, and F. Roch (2020): "Constrained Efficient Borrowing with Sovereign Default Risk," Unpublish manuscript.

——— (2022a): "Fiscal Rules and the Sovereign Default Premium," *American Economic Journal: Macroeconomics*, 14, 244–273.

——— (2022b): "Numerical fiscal rules for economic unions: The role of sovereign spreads," *Economics Letters*, 210.

Heinemann, F., S. Osterloh, and A. Kalb (2014): "Sovereign Risk Premia: The Link Between Fiscal Rules and Stability Culture," *Journal of International Money and Finance*, 41, 110–127.

Hilscher, J. and Y. Nosbusch (2010): "Determinants of Sovereign Risk: Macroeconomic Fundamentals and the Pricing of Sovereign Debt," *Review of Finance*, 14, 235–262.

Iara, A. and G. B. Wolff (2014): "Rules and Risk in the Euro Area," *European Journal of Political Economy*, 34, 222–236.

IMF (2021): "Fiscal Monitor: Strengthening the Credibility of Public Finances," Washington, DC: International Monetary Fund, October.

Islamaj, E., A. Samano Penaloza, and S. J. Sommers (2024): "The Sovereign Spread Compressing Effect of Fiscal Rules during Global Crises," *Development Research*.

Kalan, F. D., M. A. Popescu, and J. Reynaud (2018): *Thou Shalt not Breach: the Impact on Sovereign Spreads of Noncomplying with the EU Fiscal Rules*, International Monetary Fund.

Lang, V., D. Mihalyi, and A. F. Presbitero (2023): "Borrowing Costs after Sovereign Debt Relief," *American Economic Journal: Economic Policy*, 15, 331–58.

Larch, M., J. Malzubris, and S. Santacroce (2023): "Numerical compliance with EU fiscal rules: Facts and figures from a new database," *ntereconomics*, 58(1), 32–42.

Larch, M. and S. Santacroce (2020): "Numerical compliance with EU fiscal rules: The compliance database of the Secretariat of the European Fiscal Board," *European Commission*.

Larch, M. and W. van der Wielen (2024): "Comply and invest: The effect of EU fiscal rules on public investment," *Bruges European Economic Research Papers 44/2024*.

Leeper, E. M. (2010): "Monetary Science, Fiscal Alchemy," Tech. rep., National Bureau of Economic Research.

Lledó, V., S. Yoon, X. Fang, S. Mbaye, and Y. Kim (2017): "Fiscal Rules at a Glance," Washington, DC: International Monetary Fund.

Neumeyer, P. and F. Perri (2005): "Business cycles in emerging economies: the role of interest rates," *Journal of Monetary Economics*, 52, 345–380.

Reuter, W. H. (2019): "When and why do countries break their national fiscal rules?" *European Journal of Political Economy*, 57, 125–141.

Roldán, F. (2025): "The Aggregate-Demand Doom Loop: Precautionary Motives and the Welfare Costs of Sovereign Risk," *AEJ Macroeconomics*, 17, Forthcoming.

Roodman, D. (2009): "How to do xtabond2: An Introduction to Difference and System GMM in Stata," *The Stata Journal*, 9, 86–136.

Sublet, G. (2023): "The Optimal Degree of Discretion in Fiscal Policy," Manuscript.

Ulloa-Suárez, C. (2023): "Determinants of compliance with fiscal rules: Misplaced efforts or hidden motivations," *European Journal of Political Economy*, 78.

Ulloa-Suárez, C. and O. Valencia (2022): "Do Governments Stick to Their Announced Fiscal Rules? A Study of Latin American and the Caribbean Countries," *Journal of Government and Economics*, 8.

Ulloa-Suarez, C., O. Valencia, and J. Guerra (2025): "Flexible Boundaries: Evaluating the Effect of Escape Clause Activation," *Documents de travail BETA*.

Windmeijer, F. (2005): "A Finite Sample Correction for the Variance of Linear Efficient two-step GMM Estimators," *Journal of Econometrics*, 126, 25–51.

A Appendix - Charts and Tables

Country	Composition of the synthetic control
Armenia	El Salvador (14%), Ghana (14%), Qatar (14%), Ecuador (8%), Suriname (3%), Ethiopia (3%), Other countries (45%)
Costa Rica	Tunisia (84%), China (10%), Albania (6%)
Cyprus	Belarus (100%)
Czech Republic	Guatemala (36%), Slovak Republic (23%), Finland (15%), Luxembourg (13%), Canada (12%), Slovenia (1%)
Poland	Czech Republic (22%), Italy (20%), Spain (15%), Argentina (9%), South Africa (5%), Portugal (3%), Other countries (26%)
Slovak Republic	Estonia (77%), Ukraine (23%)

Table A1 Synthetic Controls

Month	Armenia	Costa Rica	Cyprus	Czech Republic	Poland	Slovak Republic
1	0.07	0.00	0.02	0.00	0.00	1.00
2	0.04	0.08	0.02	0.00	0.00	1.00
12	0.15	0.06	0.00	0.07	0.17	1.00
52	0.22	0.17	0.00	0.07	0.08	0.26

Table A2 Country-specific p-values After 1, 2, 12, and 52 Months

PUBLICATIONS

Fiscal Rules, Robust Correction Mechanisms, and Sovereign Spreads

Working Paper No. WP/2025/195