Fiscal Rules and Government Financing Costs

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Abstract

This paper assesses the effect of fiscal rules on sovereign bond spreads over the short and medium term, for 34 advanced countries and 19 emerging market economies, over the period 1980–2016. Our results, based on impulse response functions, show that the dynamic impact of fiscal rules on sovereign yield spreads is negative and statistically significant, at around 1.2–1.8 percentage points, implying lower government borrowing costs. This result stems essentially from the advanced economies subsample. We also find that more fiscally responsible countries are the ones for which a fiscal rule reduces the government’s borrowing costs. Moreover, in times of recession, a fiscal rule leads financial markets to reduce the risk premiums on government bonds. Finally, when it comes to design features of fiscal rules, independent monitoring of compliance to the rule, done outside government, also reduces sovereign spreads.

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Policy points

- Binding fiscal rules, especially those related to expenditure, signal a lower sovereign default risk.
- Consequently, lenders can then demand lower sovereign yields, which reduces sovereign spreads.
- More fiscally responsible countries are the ones that see a reduction in the government’s borrowing costs following the introduction of a fiscal rule.
- It is worthwhile for fiscal authorities to use fiscal rules to signal the government’s commitment to sounder fiscal policies.

I. Introduction

Fiscal rules have been shown to be an effective instrument to prevent the build-up of public debt. The literature on the effectiveness of fiscal rules has been motivated by the establishment of tax and expenditure limits in US federal states since the end of the 1970s and the Maastricht fiscal rules in Europe in the 1990s. The effectiveness of two different types of rules has been studied: rules for budgetary processes\(^1\) and numerical fiscal rules\(^2\). Overall, this literature is reasonably positive about the fact that rules are effective to enforce fiscal discipline. Therefore they are likely to influence investors’ expectations and, consequently, the level of risk premiums.\(^3\)

Policymakers try to enhance their fiscal reputation through the establishment of national fiscal rules. The essential problem is that these rules may reflect stability-oriented preferences of a country’s voters and politicians, and thus the effect of fiscal rules on risk premiums can be a result of a common-cause interdependence: conservative fiscal preferences might have led both to the establishment of rules and to lower risk premiums. This criticism is well known from the literature on the effectiveness of fiscal rules:\(^4\) correlation of fiscal rules and low public deficits cannot necessarily be interpreted causally. Voters who dislike public debt will favour debt limits. If this is the case, the observed fiscal link between rules and fiscal policy outcomes could be spurious. In fact, there might be a reverse causality issue whereby budgetary

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\(^1\) von Hagen and Harden, 1995; Hallerberg and von Hagen, 1999.

\(^2\) The impact of numerical fiscal rules has been looked at in several regional contexts: for the US (e.g. Eichengreen and Bayoumi, 1994; Poterba, 1996), for Europe (e.g. Debrun, 2000; Lagona and Padovano, 2007; Debrun et al., 2008), for OECD countries (e.g. Dahan and Strawczynski, 2010) and for Swiss cantons and municipalities (e.g. Feld and Kirchgässner, 2008).

\(^3\) If such a link between rules and fiscal policy outcomes is anticipated by financial markets, the reaction of a rational investor is unambiguous: he should assess the sustainability of a country’s fiscal stance more positively if it has a fiscal rule in place and demand lower compensation for the default risk of the sovereign bond than for a comparable country without any fiscal rules in place. This should contribute to a lower level of risk premiums for countries with rules.

\(^4\) Poterba, 1996.
outcomes themselves (high debt and high yields) may lead to the adoption of fiscal rules.5

Hence, this methodological problem is of immediate policy relevance. The simple introduction of a new rule does not necessarily change preferences, in particular if it is established as a consequence of external pressure. If the markets pay attention to preferences rather than to written rules, they could remain sceptical regarding high-debt countries and hence not lower the risk premiums.

We add to the literature by assessing the effect of fiscal rules on sovereign bond yields over the short and medium term for a sample of 53 countries – 34 advanced and 19 emerging markets – in the period 1980–2016. In order to find out whether fiscal rules lower governments’ financing costs, we check whether the introduction of fiscal rules is associated with lower government borrowing costs.

Our results, based on impulse response functions using the local projection method, show that the dynamic impact of fiscal rules on sovereign yield spreads is negative and statistically significant at usual levels. This result comes essentially from the advanced economies subset. Moreover, with extremely low growth, a fiscal rule leads financial markets to reduce the risk premiums on government bonds, by as much as 5 percentage points after two years. Finally, when it comes to design features of fiscal rules, independent monitoring of compliance to the rule, done outside government, also reduces sovereign spreads, suggesting that design matters.

The remainder of the paper is organised as follows. Section II reviews the most important related literature and Section III outlines the empirical methodology. Section IV presents and discusses the main results, while Section V concludes and highlights some policy implications.

II. Literature review

There are several studies addressing the relevance of fiscal rules for fiscal developments. For instance, Ayuso-i-Casals et al. (2009) report that in the EU countries from 1990 to 2005, an increase in the share of government finances covered by numerical fiscal rules led to lower deficits. Debrun et al. (2008) mention that stricter and broader fiscal rules are associated with higher cyclically adjusted primary balances. Afonso and Hauptmeier (2009) find that fiscal rules and a lower degree of public spending decentralisation in the EU contribute to a higher responsiveness of primary surpluses to government indebtedness (a Ricardian behaviour of the fiscal authorities). In addition, Heinemann, Moessinger and Yeter (2018) conduct a meta-regression-analysis on 30 studies published between 2004 and 2014 that assess the relevance of fiscal rules.

5For instance, Schaechter et al. (2012) report that several countries introduced fiscal rules after the 2008–09 economic and financial crisis.
fiscal rules. The authors report statistically significant effects of fiscal rules on fiscal aggregates – notably in terms of constraining budget deficits and, to a lower extent, sovereign debt – and government expenditures and revenues.

Still in the vein of implementing fiscally constraining rules and institutions, one can mention related work on fiscal councils. For instance, Debrun and Kinda (2017) report that the existence of (better) fiscal councils also goes hand in hand with stronger fiscal performance and fiscal forecasts, notably within a fiscal ‘reaction function’ explaining primary balance developments in a sample of 28 mostly advanced economies.

However, empirical studies dealing with the direct impact of fiscal rules on risk premiums are not abundant. As already mentioned, it remains an open question whether these rules are genuinely effective or, instead, are effective just because they mirror politicians’ and voters’ fiscal preferences. For the US, Eichengreen and Bayoumi (1994) estimate the impact of several factors on the differential between the yields on the general obligation bonds of each US state and the yield of the lowest-yielding general obligation bond. The estimated coefficient on the fiscal restraints suggests that, ceteris paribus, moving from no restraints to the most severe restraints reduces interest costs by nearly 50 basis points.\(^6\) In a subsequent related paper, Bayoumi, Goldstein and Woglom (1995) show that the impact of constitutional controls on US state borrowing depends on the level of public debt; at average debt levels, the presence of fiscal restraints is found to be associated with a reduction of the interest cost by 50 basis points. Poterba and Rueben (1999) find that US states’ fiscal rules play an important role in determining states’ borrowing costs. States with strict fiscal rules on government spending or deficits have faced lower borrowing costs during the last two decades than those with looser fiscal rules. Moreover, according to the authors, if fiscal rules are an important determinant of market interest rates, and if some rules are thought to reduce risk for bondholders, then such rules will have a larger effect on borrowing costs in some circumstances than in others. In particular, the economic effect of tight fiscal rules may be greatest when states are experiencing fiscal stress. Poterba and Rueben (2001) focus on the interaction between deficits and rules. A sudden deficit increase lifts a state’s financing costs, but the size of the rise is limited if the state has a strict rule. This result points to a credibility effect even in times of fiscal stress. Lowry and Alt (2001) show how laws that restrict state governments’ ability to carry forward a deficit improve the ability of investors to extract information from noisy signals. This affects the response of bond markets to repeated deficits (by eroding credibility) in states that have these laws. Johnson and Kriz (2005) show that revenue limits have a direct impact on state government borrowing, while the effect of expenditure, budget balance, and debt rules is

\(^6\) An interpretation of this result is that fiscal restraints lower the required return on general obligation bonds by reducing the likelihood of future surges of borrowing and hence the likelihood of default.
indirect via improved credit ratings. The authors only find a very modest effect of fiscal rules on bond spreads (between 2.4 and 3.3 basis points).

In the euro area context, Hallerberg and Wolff (2008) show that fiscal institutions play an important role for government bond yields. The quality of fiscal governance (particularly the budgeting process) is found to be a significant determinant of sovereign spreads. Iara and Wolff (2011) do not find an overall significant effect of fiscal rules on risk spreads, but they do find a significant impact if they interact the fiscal rules indicator with the general risk aversion of the market. Thus, fiscal rules only have a negative effect on bond spreads in a market environment where risk sensitivity is high. The authors conclude that national fiscal rules are found to be beneficial for market assessments of governments’ ability and willingness to service debt in a timely fashion.

Feld et al. (2017) find a robust negative effect of fiscal rules on bond spreads for Swiss cantons; this effect is quantitatively relatively strong (more than 10 basis points for strong rules). Fiscal rules are, for instance, often associated with strong enforcement mechanisms in the form of automatic tax adjustments after non-compliance with the numerical targets of the rules.

In Heinemann, Osterloh and Kalb’s (2014) analysis of European bond spreads before the financial crisis, light is shed on this issue by employing several types of stability-preference-related proxies. These proxies refer to a country’s past stability performance, government characteristics and survey results related to general trust. The authors find evidence that these preference indicators affect sovereign bond spreads and dampen the measurable impact of fiscal rules. Yet the interaction of stability preferences and rules points to a particular potential of fiscal rules to restore market confidence in countries with a historical lack of stability culture.


Finally, Badinger and Reuter (2017) report that for (up to) 79 countries over the period 1985–2012, those with more stringent fiscal rules have higher fiscal balances, lower interest rate spreads on government bonds and lower output volatility.

### III. Methodology and data issues

Difficulties in identifying the effects of fiscal rules are well documented. Since, in most countries, fiscal rules do not vary at high frequency, cross-country
variation can help to disentangle their dynamic effects on sovereign bond spreads. This provides us with sufficient identifying variation in the relevant data to assess the impact of the introduction of fiscal rules on governments’ borrowing costs.

In this paper, we rely on an alternative method to standard panel regressions. Technically, to empirically estimate the dynamic impact on sovereign bond spreads of fiscal rules over the short and medium term, we follow Jordà’s (2005) method. This method consists of estimating impulse response functions (IRFs) directly from local projections. Our main testable hypothesis is that fiscal rules contribute to reducing sovereign bond yield spreads (relative to a risk-free benchmark given by US sovereigns) and, hence, to reducing the interest bill. For each period $k$, we estimate the following regression:

$$Y_{i,t+k} - Y_{i,t} = \alpha_{i}^{k} + \sum_{j=0}^{l} \gamma_{j}^{k} \Delta Y_{i,t-j} + \beta_{k} \text{rules}_{i,t} + X_{i,t}' \delta_{k} + \epsilon_{i,t}^{k}$$

with $k = 1, \ldots, 5$ (in years) and where $Y$ corresponds to the sovereign 10-year bond spread; $\text{rules}_{i,t}$ is a binary-type dummy variable that takes the value 1 for the starting date of any fiscal rule (these can be of four types: expenditure, revenue, budget balance or debt) (in country $i$ at time $t$) and is 0 otherwise; $X_{i,t}'$ is a vector of control variables (see below for the list of variables included); $\alpha_{i}^{k}$ are country fixed effects added to capture unobserved heterogeneity across countries and time-unvarying factors; $\gamma_{j}^{k}$ and $\delta_{k}$ are coefficients to be estimated for the lagged dependent variable and the set of controls, respectively; $\epsilon_{i,t}^{k}$ is a disturbance term satisfying usual assumptions; and $\beta_{k}$ measures the impact of fiscal rules for each future period $k$. The lag length ($l$) is set at 2 as selected by the Akaike Information Criterion.

Therefore, using the starting year relates to an explicit intention to better identify our shocks and also minimise reverse causation issues. We assume that contemporaneous shocks could conceivably affect the fiscal rule variable in the same period. The IRF is valid because we assume that the introduction of the fiscal rule only affects spreads in subsequent years. Indeed, reverse causality is addressed by estimating the spreads’ impact in the years that follow the introduction of a fiscal rule.\(^9\)

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\(^8\)Note that while there typically exists a time lag between a given fiscal rule being passed and being implemented, it is not possible in our cross-country setting to get the degree of detail that would allow us to date the passing of all the rules vis-à-vis the dates of implementation in a consistent and homogeneous manner (we thank an anonymous referee for raising this point). The International Monetary Fund (IMF)’s Fiscal Rules Dataset has been used extensively in the literature in the way we use it in this paper. In addition, any implementation lags are likely to be partially addressed by the dynamic nature of the specification and the GMM technique chosen.

\(^9\)For similar applications, see, for example, Ball et al. (2013) for the distributional effects of fiscal consolidations or Furceri, Loungani and Ostry (2017) for the distributional effects of financial globalisation.
Adding covariates to the right-hand side of equation 1 partly corrects for potential biases, but endogeneity can still arise from other omitted variables (unobserved heterogeneity and selection effects), measurement errors in variables and reverse causality. Preliminary investigation revealed that the dependent variable was serially correlated such that we are required to use a dynamic panel approach to get consistent estimates of equation 1. Because the first-differenced generalised method of moments (GMM) estimator can behave poorly if time series are persistent, we use the more efficient system GMM estimator that exploits stationarity restrictions. This method jointly estimates equation 1 in first differences, using as instruments lagged levels of the dependent and independent variables, and in levels, using as instruments the first differences of the regressors.10,11 Similarly to all instrumental variable methods, GMM estimators are unbiased, and, compared with ordinary least squares (OLS) or fixed-effects (within-group) estimators, exhibit the smallest bias and variance.12 IRFs are obtained by collecting the estimated $\beta_k$ with confidence intervals computed using $\beta_k$’s standard errors.13

Our sample consists of a total of 53 countries – 34 advanced and 19 emerging markets for which the International Monetary Fund (IMF)’s Fiscal Rules Dataset has information14 and also there are sufficient data on sovereign bond yields (these come from IMF’s International Financial Statistics and the OECD).15 The time span covers 1980–2016. In line with the literature on the determinants of sovereign bond spreads (or yields),16 the vector of controls includes real GDP growth, the inflation rate (CPI-based), real GDP per capita, a measure of risk (proxied by the VIX index), the lagged debt-to-GDP ratio and central bank rates.17 These variables are retrieved from IMF’s International Financial Statistics, except central bank rates which come from

10 Arellano and Bover, 1995; Blundell and Bond, 1998.
11 We also considered estimating equation 1 with a difference GMM estimator but decided against it because the lagged dependent variable was not significant. Moreover, the tenor of the results is very similar to that using the system GMM.
13 The presence of a lagged dependent variable and country fixed effects could bias the estimation of $\gamma_j$ and $\beta_k$ in small samples (Nickell, 1981). However, in our case, this is not a problem since the finite sample bias is close to zero.
14 See International Monetary Fund (2017).
15 The advanced economies are Australia, Austria, Belgium, Canada, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hong Kong, Iceland, Ireland, Israel, Italy, Japan, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, New Zealand, Norway, Portugal, Singapore, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, the UK and the US. The emerging markets are Argentina, Brazil, Chile, Colombia, Croatia, Ecuador, Hungary, India, Indonesia, Iran, Malaysia, Mexico, Pakistan, Peru, Poland, Romania, Russia, Sri Lanka and Uruguay. The US, however, is then lost in the empirical analysis as it is used as the risk-free benchmark to compute the yield spreads (our dependent variable).
17 We thank anonymous referees for suggestions on the set of controls to include.
FIGURE 1
Distribution of new fiscal rules implemented over time by income group

a) Advanced economies

b) Emerging market economies

Source: IMF’s Fiscal Rules Dataset.

Haver Analytics or the Bank of International Settlements.\textsuperscript{18} Summary statistics of the main variables used in the empirical analysis are shown in Table A1 in the online appendix.

\textsuperscript{18}Note that there are 20 countries in our data set for which we could not obtain central bank rates. Hence, this variable is not always used but is employed as a robustness check to baseline results maximising the total number of countries/observations.
As far as fiscal rules are concerned, we can plot the absolute number of new rules (of any type) over time by income group, giving the pattern observed in Figure 1. Looking at advanced economies, while countries have implemented fiscal rules since the mid 1980s, most of them followed the Maastricht Treaty in 1992 (in adherence to the EU convergence criteria) or came after the global financial crisis. In emerging market economies, the absolute number of fiscal rules is lower than for the advanced economies sample, and most of them were implemented starting in the early 2000s.

Looking at governments’ borrowing costs (proxied by long-term (10-year) bond spreads), Figure 2 shows that in both advanced and emerging market economies, there has been a convergence towards smaller and smaller spreads/yields. However, the downward speed in spreads/yields is faster for advanced economies than for emerging markets. During the global financial crisis period, the top quartile (pc75) highlights the higher pricing of risk that investors put on some stressed countries – a feature that has disappeared in the more recent years.

IV. Empirical analysis

1. Fiscal rules and government borrowing costs

Our main hypothesis is that the introduction of fiscal rules is associated with lower government borrowing costs and hence, by reducing the burden associated with the interest bill, they would allow for the reinforcement of fiscal space. In panel a of Figure 3, we observe that our main hypothesis can be considered as valid since the IRF – displaying the dynamic impact of fiscal rules on bond spreads – is negative and statistically significant at the 10 per cent level. This result is mostly driven by the impact that rules have in the advanced economies sample, since the effect for emerging market economies

**FIGURE 3**

Dynamic impact on sovereign bond spreads after the introduction of fiscal rules

a) All countries  

b) Advanced economies  

c) Emerging markets

*Note:* Dotted lines are 90 per cent confidence bands. The horizontal axis measures the number of years after the introduction of a given fiscal rule at \( t = 0 \).
is not statistically different from zero (confidence bands above and below the horizontal axis).\footnote{To check the validity of our instruments and assess the strength of our identification, we rely on the Hansen J-statistic (for details, see Roodman (2009)). The $p$-values of the Hansen overidentifying restrictions test are used to check the null hypothesis of the instrument set being valid and exogenous, while the null of no autocorrelation is checked through Arellano–Bond AR(1) and AR(2) tests. We find that the Hansen J-statistic $p$-values are always in excess of 10 per cent, while we can reject the AR(1) but not the AR(2) test.}

We also conducted a sub-analysis by type of fiscal rule (see Figure A1 in the online appendix) and found that, for the whole sample, the introduction of expenditure rules seems particularly relevant in lowering government borrowing costs (implementing revenue-based, debt-based or budget-balance-based rules yielded insignificant or unclear results). Indeed, the relevance of fiscal rules simply flags to capital markets the commitment of the issuer to deal with fiscal imbalances in a forceful way. For the case of spending rules, this and the fact that they turn out to be more relevant than revenue rules can be understood in the context of the fiscal adjustments achieved in this way being more successful.

In addition, and as shown in Table A2 in the online appendix, one or two years after the introduction of any type of fiscal rule, there is a decrease in sovereign spreads of around 1.2–1.8 percentage points in the full sample. This effect is mostly sustained over a time horizon of four years, but essentially stems from the advanced economies subsample. Indeed, in the case of the emerging market economies, the adoption of a fiscal rule decreases spreads but its effect is not indistinguishable from zero.\footnote{For reasons of parsimony, the detailed results underlying the remaining IRFs presented in this paper are omitted, but they are available from the authors upon request.} Results using sovereign bond yields instead of spreads are displayed in Figure A2 in the online appendix, where the vector of controls is expanded to include changes in the real effective exchange rate (from IMF’s International Financial Statistics).\footnote{We thank an anonymous referee for suggesting the introduction of a variable capturing movements in exchange rates.} As one can observe, the IRFs are qualitatively similar to those in Figure 3. As additional sensitivity exercises, we performed standard panel data within-estimator regressions along the lines of Afonso and Guimarães (2015), yielding qualitatively analogous results (these are available upon request). We also added to the vector of controls central bank rates (which considerably reduced the sample), with the results remaining in line with previous findings. Finally, we checked the sensitivity of our IRFs to different lag structures and the results remained qualitatively unchanged.

2. Fiscal rules and fiscal responsibility

From the previous set of results, one is left wondering whether rules are indeed effective in reducing interest costs or whether there exists a hidden explanatory
variable – which is the preference for fiscal discipline (or government ‘type’) – that can create an endogeneity bias. Indeed, it is not because fiscal rules are associated with lower borrowing costs that, on average, the introduction of a fiscal rule can reduce borrowing costs (recall Poterba’s (1996) causal criticism). Perhaps fiscal rules are simply revealing/signalling the government’s (or voter’s) type instead of changing deep-rooted underlying fiscal behaviours.22

Our next exploratory step is to test the following (second) hypothesis: do rules have a stronger (negative) impact on borrowing costs in countries that are more fiscally responsible (or in a stronger fiscal position)? Indeed, it is the hypothesis that rules work better in reducing interest rate costs when coupled with lower indebtedness that can pinpoint the existence of different preferences for debt levels (and countercyclical budget deficits).

Therefore, here we measure fiscal responsibility in two alternative ways:

- **Definition 1.** With the level of the debt-to-GDP ratio: countries with lower debt are associated with sounder and healthier public finances.
- **Definition 2.** With the degree of fiscal policy countercyclicality. In a nutshell, in a static setting, the empirical approach to measuring the contribution ‘on impact’ of fiscal policy to aggregate stability involves estimating the response of a budgetary indicator to changes in economic activity,23 i.e.

\[
BB_i = \alpha_i + FC_i GAP_i + \epsilon_i,
\]

(2)

where \(BB\) is the budget-balance-to-GDP ratio (from the IMF’s International Financial Statistics), \(GAP\) is a measure of the output gap and \(FC\) measures the degree of fiscal countercyclicality, with larger values of the coefficient denoting higher countercyclicality (and, for our purposes, more fiscal responsibility). We then generalise equation 2 by introducing the assumption that the regression coefficients may vary over time:

\[
BB_{i,t} = \alpha_{i,t} + FC_{i,t} GAP_{i,t} + \epsilon_{i,t}.
\]

(3)

The coefficient \(FC\) is assumed to change slowly and unsystematically over time, with its expected value being equal to its past value. The change of the

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22See Poterba and Rueben (1999) for the US states.
23Lane, 2002; Fatás and Mihov, 2012.
24We apply Hamilton’s (2017) filter to extract the cyclical and trend components of GDP. We do so since we are aware of the criticisms surrounding, for instance, the use of the Hodrick–Prescott (HP) filter, particularly in the context of a large heterogeneous sample (Cogley and Nason, 1995). Results using the standard HP filter instead yield qualitatively similar conclusions. The output gap is expected to mirror the dynamics of temporary demand disturbances. We have also done the estimation using real GDP growth as the proxy for economic activity, which would capture a mix of both demand and supply shocks. Results are qualitatively similar.

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coefficient is denoted by $v_{i,t}$, which is assumed to be normally distributed with expectation 0 and variance $\sigma_i^2$:

$$FC_{i,t} = FC_{i,t-1} + v_{i,t}. \tag{4}$$

Equations 3 and 4 are jointly estimated using the Varying-Coefficient model proposed by Schlicht (2003) for a sample of 69 countries between 1980 and 2016.25

To empirically test this second hypothesis, we run the following alternative regression:

$$Y_{i,t+k} - Y_{i,t} = \alpha_k^i + \theta_k^i + \sum_{j=1}^{l} \gamma_{j}^k \Delta Y_{i,t-j} + \rho_k V(z)$$

$$+ \beta_{k}^{fiscally \_irresp} V(z) \text{ rules}_{i,t} + \beta_{k}^{fiscally \_resp} (1 - V(z)) \text{ rules}_{i,t}$$

$$+ X'_{i,t} \delta_k + \epsilon_{i,t}^k,$$  \tag{5}

with $V(z_{i,t}) = \frac{\exp(-\gamma z_{i,t})}{1+\exp(-\gamma z_{i,t})}$, $\gamma = 1.5$, where $z$ is an indicator of the degree of fiscal responsibility (using either definition 1 or definition 2 as defined above) normalised to have zero mean and unit variance.26 The remainder of the variables and coefficients are defined as in equation 1.

This method is equivalent to Granger and Teräsvirta’s (1993) smooth transition autoregressive model. The main advantage of this approach relative to estimating SVARs27 for each regime is that it uses a larger number of observations to compute the IRFs of only the dependent variables of interest, improving the stability and precision of the estimates. This estimation strategy can also more easily handle the potential correlation of the standard errors within countries, by clustering at the country level.28

In Figure 4, we plot the estimated coefficients coming from two separate regressions, one carried out for the debt-to-GDP ratio (definition 1) and another for the degree of fiscal policy countercyclicality (definition 2). Countries that are fiscally more responsible (using either definition) are indeed those for which the introduction of a fiscal rule reduces the government’s borrowing costs. The IRFs are negative and statistically significant throughout the

25 For further details, see Furceri and Jalles (2018a and 2018b).

26 Changing the value of $\gamma$ does not qualitatively alter our main results.

27 SVAR stands for structural vector autoregression.

28 This approach has been applied to model non-linearities in a number of different economic issues such as exchange rate dynamics (Sarno and Taylor, 2002), sectoral performance during the business cycle (Fok, van Dijk and Franses, 2005), money demand (Chen and Wu, 2005) and fiscal multipliers (Auerbach and Gorodnichenko, 2012).
FIGURE 4
Dynamic impact on sovereign bond spreads after the introduction of fiscal rules:
fiscally responsible countries

a) Highly fiscally responsible
countries: definition 1, measured
by low public-debt-to-GDP ratio

b) Highly fiscally responsible
countries: definition 2, measured by high
degree of fiscal policy countercyclicality

Note: Dotted lines are 90 per cent confidence bands. The horizontal axis measures the number of years after
the introduction of a given fiscal rule at \( t = 0 \).

four-year horizon (particularly when using definition 1). Results for fiscally
irresponsible countries yield IRFs that are statistically not different from zero
(not shown).

3. Fiscal rules and government borrowing costs over the business cycle

In order to explore whether changes in sovereign bond spreads in response
to fiscal rules shocks vary depending on the phase of the business cycle, the
following alternative regression is estimated:

\[
Y_{i,t+k} - Y_{i,t} = \alpha_k^i + \theta_t^k + \sum_{j=0}^{l} \gamma_j^k \Delta Y_{i,t-j} + \rho_k H(z)
\]

\[+ \beta_k^{bad} H(z)rules_{i,t} + \beta_k^{good} (1 - H(z))rules_{i,t} + X_{i,t}^l \delta_k + \epsilon_{i,t},\]

with \( H(z_{i,t}) = \frac{\exp(-y z_{i,t})}{1 + \exp(-y z_{i,t})}, \gamma = 1.5 \), where \( z \) is an indicator of the state of the
economy (using the real GDP growth rate) normalised to have zero mean and
unit variance.\(^{29}\) The remainder of the variables and coefficients are defined as
in equation 1.

\(^{29}\)Following Auerbach and Gorodnichenko (2012), \( \gamma = 1.5 \) is used for the analysis of recessions and
expansions. Periods of very low (high) growth identified in this analysis also correspond to periods of large
negative (positive) output gaps (cf. footnote 24). Similar results are indeed found when the output gap rather
than GDP growth is used.
4. The relevance of the design features of fiscal rules

Finally, our last testable hypothesis is whether fiscal rules help to reduce bond spreads for those countries that are fiscally less responsible (the ‘poor’ performers) but whose rules present some desired design features. To test this, the following equation is estimated:

\[
Y_{i,t+k} - Y_{i,t} = \alpha^k_i + \theta^k_i + \sum_{j=1}^{l} \gamma^k_j \Delta Y_{i,t-j} + \rho_k G(z) + \beta_k \text{design rules}_{i,t} + \delta_k X_{i,t} + \epsilon^k_{i,t},
\]

with design in turn taking the value 1 when: (i) the monitoring of compliance to the fiscal rule is done outside of government; (ii) the rule contains a well-specified escape clause; (iii) an independent body monitors the implementation of the rule; (iv) there is transparency and accountability in managing the rule; or (v) the rule includes a provision to adapt to business-cycle conditions for stabilisation purposes. These dummies characterising a given fiscal rule
take the value 0 otherwise (these design features also come from the IMF database).

Out of these five characteristics, the ones for which estimating equation 7 yields statistically significant results are (i) and (iii). Results for the subsample

FIGURE 6
Dynamic impact on sovereign bond spreads after the introduction of fiscal rules: selected design characteristics, ‘poor’ fiscal performers

a) Monitoring of compliance outside government (enforcement)

b) Independent body monitors implementation (supporting institutions)

c) Well-specified escape clause

d) Transparency and accountability

e) Stabilisation provision embedded

‘Poor’ fiscal performers are defined as having an average debt-to-GDP ratio over the period 1980–2016 above the respective country group’s (advanced economies or emerging markets) median.

Note: Dotted lines are 90 per cent confidence bands. The horizontal axis measures the number of years after the introduction of a given fiscal rule at $t = 0$. 
of ‘poor’ fiscal performers (here measured as having an average debt-to-GDP ratio over the period 1980–2016 above the respective country group’s (advanced economies or emerging markets) median for the same period) are displayed in Figure 6. We observe that even for this group of ‘poor’ fiscal performers, the introduction of fiscal rules can indeed help to create fiscal space by lowering borrowing costs if the design of the rules includes sufficiently strong enforcement and the assistance of independent supporting institutions. Having a well-specified escape clause seems to impact negatively on sovereign bond spreads. The new-generation fiscal rules, especially those designed in the wake of the recent financial crisis, do include escape clauses. The problem here is that fiscal rules with escape clauses, especially when the ‘extraordinary’ situations are not well defined or try to cover all conceivable future events, become complex and hence lose their credibility, defeating the very purpose of them.

V. Conclusion

We have studied the effect of fiscal rules on sovereign bond yields and spreads over the short and medium term, for 34 advanced countries and 19 emerging markets, in the period 1980–2016. We have assessed how the existence of such spending, revenue or debt rules helps reduce government borrowing costs.

Based on our results from estimated impulse response functions, we find that the dynamic impact of fiscal rules on bond yield spreads is negative and statistically significant, implying lower government borrowing costs (linked to lower spreads in the full sample of around 1.2–1.8 percentage points). This result rests mostly on the advanced economies country subset. Also, with extremely low growth, the existence of a fiscal rule leads financial markets to reduce the risk premiums on government bonds. Moreover, monitoring of compliance to the fiscal rule done outside of government and the existence of an independent institution that monitors the implementation of the fiscal rule also contribute to reducing government borrowing costs.

Regarding some additional experiments, the results using sovereign bond yields instead of spreads provide IRFs that are qualitatively similar to those for sovereign yield spreads.

From a policy perspective, we can then highlight that the existence of binding fiscal rules, particularly those aimed more at the spending side of the government budget and ones that are clearly observable (notably by capital markets), signals a lower sovereign default risk. Consequently, institutional lenders can then demand lower sovereign yield spreads from the government. We also find that more fiscally responsible countries are the ones for which the introduction of a fiscal rule reduces government borrowing costs and that there is a case for the existence and setting up of independent fiscal monitoring.
institutions. Therefore, overall, it is worthwhile for the fiscal authorities to use fiscal rules since there is a gain, notably in terms of borrowing costs and also in terms of signalling to voters the government’s commitment to sounder and less costly fiscal policies.

Supporting information

Additional supporting information may be found online in the Supporting Information section at the end of the article.

• Appendix

References


