Signaling to Creditors and Voters: The Determinants of the Strengthening of National Fiscal Rules

Abstract

Fiscal rules, which set de-jure limits for fiscal policy aggregates, are spreading fast among countries. However, why and when governments strengthen their national fiscal legal frameworks are less well understood. This article argues that governments use the strengthening of fiscal rules to signal commitment to fiscal prudence to both creditors and national voters. It investigates this theoretical argument empirically by using a worldwide panel of countries from 1985-2013. The empirical analyses find robust evidence that fiscal rules stringency is larger when government debt increases and in election years but mixed evidence that being under an IMF program increases the strength of fiscal rules. National governments do seem to use the strengthening of the national fiscal rules framework as a sign of commitment to fiscal discipline to both market and non-market creditors as well as domestic voters by at least de-jure tying their own hands fiscally. Currency union membership seems to decrease the stringency of the national fiscal legal framework, which again suggests that the strengthening of fiscal rules serves as a signaling tool, when governments face potential credit worthiness pressure.

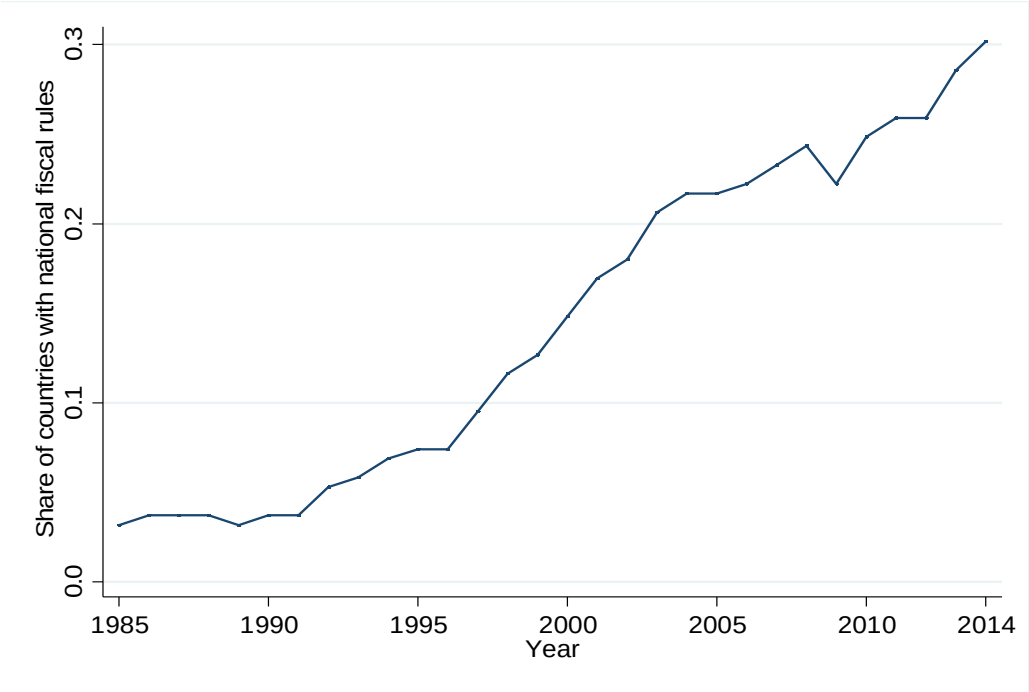
Author: Lasse Aaskoven, University of Copenhagen.

E-mail: lasse.aaskoven@ifs.ku.dk

Introduction

One of the fastest spreading governance institutions over the past decades has been national numerical fiscal rules. National fiscal rules can be defined as rules governing national fiscal policy, including balanced budget rules, rules which set ceilings for public expenditure levels as well as rules for the maximum allowed level of national debt. Even ignoring supranational fiscal rules such as the European Union's Economic and Monetary Union's (EMU) Stability and Growth Pact and the later Fiscal Compact, an increasing number of both developing and developed countries have enacted some sort of fiscal rule in the past two decades (Schaechter et al. 2012, 5-16). Figure 1 shows the development in the share of countries with a least one national fiscal rules in place.

Figure 1. Share of countries with at least one national fiscal rule in place 1985-2014



Source: The IMF's Fiscal Rules Database.

In response to the recent years' fiscal crises in many European countries and the ongoing discussion about government debt and deficits in many developed and developing economies, national fiscal rules have been an often discussed potential solution to the problem of unsustainable public finances (Hauptmeier et al. 2011; Wyplosz 2013, 523). They are also increasingly being promoted by international organizations like the International Monetary Fund (IMF) (Schaechter et al. 2012) and the European Union (EU), where the EU's 2012 Fiscal Compact treaty specifically called for the implementation of the compact's provisions into the member states' national fiscal rules frameworks. The trend towards greater reliance on these fiscal rules for fiscal policy-making potentially represents a shift away from fiscal policy as a discretionary policy tool, and, according to some scholars, even a partly depoliticization of national fiscal policy (Fernández-Albertos 2015, 31). The ascent and institutional set-up of these national fiscal rules are thus not trivial concerns from a political-economy point of view.

However, while there has been a general trend towards more and more stringent national fiscal rules, great variation still exists between countries with regards to the existence, numbers, legal basis and scope of these rules. Some fiscal rules are introduced as merely stated government priorities, while other fiscal rules are part of countries' constitutions. In certain cases, rules only cover the central government, while other types of rules set rules and guidelines for all parts of the public sector. Some fiscal rules have automatic enforcement mechanisms and/or independent fiscal councils to monitor whether the rules are upheld, while other rules have none of these auxiliary institutions. Furthermore, some countries have experienced periods with both strengthening and loosening of fiscal rules and their auxiliary frameworks. Taking Argentina as an example, according to data from the International Monetary Fund (IMF) Argentina had a so-

called Fiscal Responsibility Law in place from 2000 to 2008 but had significant changes to their legal fiscal framework from 2009 and onwards making their fiscal framework less strict. Sweden on the other hand enacted an expenditure rule and a balanced budget rule through government coalition agreements in the late 1990s and early 2000s and later gave these rules statuary status in 2010 (Bova et al. 2015).

The factors driving these differences and tendencies remain elusive. Very little is known for why countries enact fiscal laws, and why they strengthen their scope and legal basis, which constitutes a significant scholarly void especially given the relatively fast spread of these types of institutions. The majority of previous research on fiscal rules have concerned their actual effect on fiscal policy aggregates (Debrun et al. 2008; Holm-Hadulla et al., 2012; Reuter 2015; Bergman and Hutchison 2015; Bäck and Lindvall 2015, 65-67) and has generally found that fiscal does not indeed seem to affect and constrain government fiscal policy. A summary of the empirical evidence of the effects of fiscal rules can be found in Heinemann et al. (2017). However, very little of this scholarship deals with the causes of fiscal rules' framework and why these differ across countries.[1]

This article specifically investigates the economic and political determinants of the strengthening of national fiscal rules both theoretically and empirically. It builds on the simple formalized theoretical argument that national governments will use the strengthening of fiscal rules as a tool to signal commitment to fiscal responsibility to both creditors and voters. Analyses

[1] Exceptions include Altunbas and Thornton (2017) and Badinger and Reuter (2017a).

based on panel data with a majority of the World's countries in the years 1985-2013 robustly support this argument. Fiscal rules stringency is larger when debt to GDP is higher, which might induce creditors to demand higher interests. Fiscal rules are also strengthened in election years, which suggest that governments use increased stringency of fiscal rules to signal commitment to fiscal responsibility to voters when they need to. There is mixed evidence that the involvement of another type of creditor, the IMF, causes fiscal rules to be strengthened. Countries which are under a current IMF program increase their fiscal rules stringency, while countries with previous IMF involvement actually decrease the stringency of their fiscal rules framework, perhaps because IMF involvement induces a moral hazard problem with regard to fiscal management. Membership of a currency union decreases the effort to strengthen national fiscal rules, presumably because currency union membership is another signal to creditors which relieves the government of some of the pressure to appear fiscally competent at the national level.

National governments seem to use fiscal rules in an effort to appease market and non-market creditors as well as national voters. In this way, the results of this article contribute to the wider scholarly and policy discussions about whether and how market actors and voters independently and simultaneously exhibit pressure on incumbent national and subnational governments within the contexts of government fiscal policy and fiscal policy rules (Hallerberg 2011; Kelemen and Teo 2014; DiGiuseppe and Shea 2015). The results of this article suggest that the choice of national fiscal institutions seems to be an area where national governments might not face a trade-off with regards to being responsive to national and international market actors and their own national voters, which is often assumed and found in the international political economy literature on voters and markets (Ezrow and Hellwig 2014, 818).

Theory: Fiscal rules as a government signaling tool

This article's theoretical argument is that the introduction and strengthening of fiscal rules will be used by national governments in an attempt to signal fiscal prudence to both government creditors and voters. National governments are assumed to be concerned with increasing discretionary spending opportunities and to secure reelection. While stricter fiscal rules might be a disadvantage for an incumbent government, since they decrease a government's discretion with regards to public spending, tightening fiscal rules and auxiliary institutions is a way of signaling that the government is concerned with the sustainability of public finances, which might improve overall spending opportunities due to cheaper credit. An implication of this argument is that strengthening the national fiscal rules framework should be more likely when government debt is high. The reasoning behind this argument is that government creditors, including domestic and international market actors, might be inclined to demand higher interest rates in the case of high government debt, which might depress government spending opportunities. So the government should have a larger relative incentive to use a more stringent fiscal rules framework as a signaling tool when government debt is high. This strategy could also be used in an attempt to cater to non-market financiers such as the IMF during lending programs, where strengthening the fiscal rules framework might give a government access to more funds on better terms.

On the pure domestic political side, the strengthening of fiscal rules also serves as a signal of commitment to the sustainability of public finances, which voters are assumed to care about. Therefore, reelection concerned governments should be more likely to tighten the fiscal rules framework, when they have the largest need to appeal to voters, which should be just before

elections. A potential empirical example of this dynamic include New Zealand's Fiscal Responsibility Act, which among other elements included provisions for the government budget balance and debt levels (Bova et al. 2015, 49). The act was presented to parliament by the incumbent finance minister Ruth Richardson in September 1993 just months before the New Zealand general election in November 1993. The act was passed into law the year after following a narrow electoral victory for the incumbent National Party, see Scott (1994).

According to the arguments above, we should expect fiscal rules stringency to be higher when government debt is high, just before elections, and when national government are receiving funding from international non-market organizations such as the IMF. To clarify the elements and assumptions behind these arguments they are summarized in a simple formal model below, where an incumbent government seeks to maximize discretionary spending subject to concerns about interest payments, the opportunity to gain funding from an international organization and the incentive to secure reelection. The model exclusively takes the viewpoint of the incumbent government, and creditors and voters' reactions to the government's actions are not contained within the model in order to keep the line of argument simple.

Fiscal rules as creditor signaling

Imagine an incumbent government which decides on whether to increase the stringency of the national fiscal framework. The incumbent government draws its utility from rents, which in this model should be interpreted more broadly as the government discretionary spending. The government's utility function can be written as

$$\omega = \mathrm{r} \tag{1}$$

Rents are a function of total government revenue represented by γ, minus interest payments denoted by I and minus the stringency of fiscal rules framework represented by ε.[2]

$$r = \gamma - I - \varepsilon \tag{2}$$

Intuitively if fiscal rules are stricter national governments will be less able to spend discretionary. However, the stringency of the national fiscal rules' framework variable also affects other factors in the model, which might affect the government's utility positively. The government consequently faces a trade-off with regards to setting the level of this variable.

Interest payments is in itself a function of the government's debt level, denoted by δ.[3] Intuitively the higher government debt is the larger the interest payment on this debt is. Furthermore, the level of government debt is also a predictor of government creditworthiness (Afonso et al. 2010; Dell'Erba et al. 2013) and thus the average interest rate the government has to pay for its debt. However, the interest payment is also contingent on the stringency of the fiscal rules framework, since stricter fiscal rules increase government credit worthiness and thus lowers the average interest rate on the government's debt. An assumption which is in line with previous studies of the effect of fiscal rules on credit ratings (Feld et al. 2014; Kelemen and Teo 2014; Badinger and Reuter 2017b). The equation of government's estimate of the determinants of the interest rate can be seen in equation 3.

[2] By assumption $\varepsilon \geq 1$.

[3] By assumption $\delta > 0$.

$$I = \delta \frac{1}{\varepsilon} \tag{3}$$

Substituting the function of government's rents and the determinants of the interest payments into the government's utility function the government maximizes the below equation with regards to ε.

$$Max\ \omega = \gamma - \frac{\delta}{\epsilon} - \varepsilon \tag{4}$$

First order condition is

$$0 = \frac{\delta}{\varepsilon^2} - 1 \tag{5}$$

Solving for ε yields

$$\varepsilon = \sqrt{\delta} \tag{6}$$

The stringency of the fiscal rules framework thus becomes larger with government debt in line with previous empirical findings (Altunbas and Thornton 2017). Intuitively, the government imposes stricter fiscal rules when government debt is high in order to prevent interest rates and thus aggregate interest payments from increasing, which would otherwise depress government spending opportunities, even though a stricter fiscal rules framework makes it harder for the government to spend discretionary.

Extension: Signaling to non-market creditors

The logic of using the strengthening of fiscal rules as a signaling tool for market creditor appeasement can be extended to analyze the role of international non-market financiers such as the IMF, which can potentially be an important source of credit for especially developing

countries. Countries receiving IMF loans or other subsidies from non-market international organizations could use the strengthening of national fiscal rules to signal commitment to future fiscal discipline in order to get more favorable terms and more funding within a lending program. The IMF does indeed seem to take national fiscal rules into account when assessing the outlook for countries' public finances as evidenced by a recent country report on Brazil (IMF 2016, 2).

Furthermore, strengthening the fiscal rules framework might both implicatively or explicitly be part of the conditions associated with getting funding from especially the IMF. See Stone (2008), Steinwand and Stone (2008, 135-138) and Dreher (2009) for some discussions about IMF program conditionality. The IMF has generally promoted fiscal rules as a solution to issues of fiscal discipline and conducted analysis and data collection on the topic for some time (Kopits 2001). To represent the situation where a country receives funding from a non-market international organization such as the IMF, in equation 7 the revenue of the government γ is broken down into two items, the government's own tax revenue denoted by T and a subsidy/non-market-interest loan from an international organization denoted by L.

$$\gamma = T + L \tag{7}$$

The size of the non-market-interest loan from the international organization is determined by the international organization's budget line represented by π minus the repayment insecurity, which is a function of the international organization's perceived risk aversion with regards to the country in question, denoted by α, divided by the stringency of the fiscal rules framework.

$$L = \pi - \frac{\alpha}{\varepsilon} \tag{8}$$

Intuitively, the more stringent the national fiscal rules framework is the less uncertain the international organization is about the risk of non-repayment by the country in question. Consequently, the international organization is willing to provide a larger amount of credit to the country in question if its' fiscal rules framework is more stringent. The function could also represent a situation where strengthening the national fiscal framework is part of the conditions for receiving the non-market-interest loan from for an example the IMF. Substituting the functions in equation 7 and 8 into the government's utility function in equation 2 above, the government maximizes the below function with ε.

$$Max\ \omega = T + \pi - \frac{\alpha}{\varepsilon} - \frac{\delta}{\varepsilon} - \varepsilon \tag{9}$$

The following first order condition is

$$0 = \frac{\alpha}{\varepsilon^2} + \frac{\delta}{\varepsilon^2} - 1 \tag{10}$$

Solving for ε yields

$$\varepsilon = \sqrt{\delta + \alpha} \tag{11}$$

So in a situation where a country receiving non-market-interest loans/subsidies from an international organization the fiscal rules framework's stringency does not only depend on the level of government debt but also on the perceived risk aversion of the international organization. If we assume a positive value of α then everything else being equal $\sqrt{\delta + \alpha} > \sqrt{\delta}$, and fiscal rules stringency will be higher if the country is receiving funding from a non-market international organization such as the IMF. Consequently, we should expect fiscal rules stringency to be higher when a country is under an IMF lending program.

Introducing elections

So far the incumbent government has been concerned with maximizing discretionary spending under the constraint of access to credit. But a government might be concerned with other objectives. Most governments are also interested in continuing being in power. In most democratic polities election results determine whether incumbent governments will continue to hold office. Thus incumbent government often alter their behavior in response to upcoming elections in order to appear more competent for voters[4]. This subsection expands the model from the previous subsections with an election. The argument of this version of the model is that increasing the stringency of the fiscal rules framework can serve as a tool for incumbent governments to signal a higher level of fiscal prudence in order to appeal to voters before elections. Holding debt levels and lending programs constant we should therefore experience a higher propensity to strengthen the fiscal framework/introducing fiscal rules in election years.

The model with an election is based on a simple modification of the career-concern model from Persson and Tabellini (2000, 81-87). In this version of the model the government can face two different scenarios, which can be interpreted as two time periods. One scenario without an election, which is similar to the version of the model above, and a situation where an election takes place, and where the outcome of this election is also of interest for the incumbent government. Consequently, in the election scenario the government derives utility from both present rents and the expected utility of winning the election. This expected utility is probability

[4] This logic underscores most theoretical and empirical studies of *political budget cycles*, see for an example Rogoff (1990) and Aidt et al. (2011).

of winning the election denoted by P times the exogenous ego rents from winning the election denoted by R.[5]Now the objective function of the government is

$$\omega = r + PR \tag{12}$$

The perceived probability of winning the election is based on the government's perception of voters' electoral choice. Similar to most models of political budget cycles (Rogoff 1990), voters are assumed to mainly base their evaluation of the government on the government's actions in the election period in line with empirical findings (Healy and Lenz 2014). The government thus only alters its actions due concerns about voter evaluation in the scenario where an election takes place. Voters are assumed by the government to be socio-tropic and only concerned with the stability of public finances denoted by σ. The government's assumption that voters care about fiscal sustainability is in line with findings which suggest that voters might indeed punish incumbent governments for increases in public deficit (Brender and Drazen 2008) and debt (Kim and Kwon 2015). However, this argument does not necessarily imply that voters are fiscally conservative (Peltzman 1992) and prefer a lower level of public spending but only that the government perceives that voters are concerned with the sustainability of public finances. Voters are thus perceived to prefer that the government is able to provide them with a sustained level of public spending. The preferences of the voters can be written as

$$\mu = \sigma \tag{13}$$

The stability of public finances is a function of the government's fiscal prudence denoted by θ and exogenous macro-economic conditions denoted by ρ.[6]

[5] By assumption $R > 0$.

$$\sigma = \theta\rho \tag{14}$$

The fiscal prudence of the government is a random variable with a uniform distribution, an expected value of 1 and a density represented by φ, which can be written as $\left[1 - \frac{1}{2\varphi}, 1 + \frac{1}{2\varphi}\right]$.

The election is held between the incumbent government and a challenger to the government, denoted by C. In the model, the government believes that the voters will vote on the basis of the government's fiscal prudence. However, voters cannot directly observe the incumbent government's fiscal prudence but can make an estimate based on observed stability of the public finances, the macroeconomic conditions and the stringency of fiscal rules framework. Intuitively, the government's perception is that if it "ties itself" fiscally through a strengthening of the national fiscal rules framework it will be perceived by the voters as more fiscally prudent and committed to the stability of public finances. Note that this does not imply that this fiscal framework will inevitably increase fiscal prudence but that the incumbent government views it as a signal of fiscal prudence and commitment to fiscal discipline to the voters. The estimate of the government's fiscal prudence $\tilde{\theta}$ is thus given by

$$\tilde{\theta} = \frac{\sigma}{\rho}\varepsilon \tag{15}$$

The government expects that the voters will vote for the incumbent government in the election, if its perceived level of fiscal prudence is equal to or higher than its challenger, whose perceived level of fiscal prudence is set to the expected value of θ. So the probability for the government of winning the election is

[6] By assumption $\rho > 0$.

$$P = \begin{cases} 1 \; iff \; \tilde{\theta} \geq C(\theta) = 1 \\ 0 \qquad otherwise \end{cases} \tag{16}$$

The perceived probability of reelection for the incumbent government is therefore given by $Prob\left[\tilde{\theta} \geq 1\right]$. Combining the equation for the stability of public finances and the equation for the voters' estimate of government's fiscal prudence $\tilde{\theta} \geq 1$ is equal to $\frac{\theta\rho}{\rho}\varepsilon \geq 1$, which can be rewritten as

$$\theta \geq \frac{1}{\varepsilon} \tag{17}$$

The perceived probability that the incumbent government wins the election is the probability that the above inequality is satisfied. Given the distribution of θ the probability can be written as

$$P = \frac{1}{2} + \varphi\left[1 - \frac{1}{\varepsilon}\right] \tag{18}$$

Substituting the above probability function and the government rent function in equation 9 into the incumbent government's objective function in equation 12 yields the following equation.

$$\omega = T + \pi - \frac{\alpha}{\varepsilon} - \frac{\delta}{\varepsilon} - \varepsilon + \left[\frac{1}{2} + \varphi(1 - \frac{1}{\varepsilon})\right] R \tag{19}$$

This function is reduced into equation 20. The government then maximizes this function with regards to ε.

$$Max\ \omega = T + \pi - \frac{\alpha}{\varepsilon} - \frac{\delta}{\varepsilon} - \varepsilon + \frac{1}{2}R + \varphi R - \frac{\varphi R}{\varepsilon} \tag{20}$$

The following first order condition is

$$0 = \frac{\alpha}{\varepsilon^2} + \frac{\delta}{\varepsilon^2} - 1 + \frac{\varphi R}{\varepsilon^2} \tag{21}$$

Solving for ε yields

$$\varepsilon = \sqrt{\delta + \alpha + \varphi R} \tag{22}$$

So with the introduction of an election the government's effort to expand the stringency of the fiscal rules framework does not only depend on government debt level and the perceived risk aversion of the international organization but also on the ego rents from winning the election and the density of the fiscal prudence distribution. The stringency of the fiscal rules framework not only serves, at least perceivably, to increase the government's ability to gain financing, but is also a signal to voters about the government's commitment to upholding fiscal sustainability.

Comparing the version of the model without the election with the version with an election, as the rents from winning the elections are always assumed to be positive, then if debt levels and risk aversion are of equal sizes in the two scenarios $\sqrt{\delta + \alpha + \varphi R} > \sqrt{\delta + \alpha}$. Consequently, the government will do more to increase the stringency of the fiscal rules framework in a period with an election than in a time period where an election is not held. Intuitively, when the government is up for election it will need to signal to the voters that it is committed to fiscal prudence in order to increase the chance of reelection. Increasing the stringency of the fiscal rules framework can serve this task. However, in times when the government is not up for reelection, the government will not care about how it appears to voters and will not use increased stringency of the fiscal rules framework as a signaling tool to voters but only as a signaling tool to creditors in order to increase spending opportunities.

The above model gives three implications which are empirically testable. We should observe a more stringent fiscal rules framework when government debt is higher, as the government will try to prevent interest rates to rise. The stringency of the fiscal rules framework should also be higher when the government is receiving funding from the IMF, as the government attempts to appease this creditor. Finally, the stringency of the fiscal rules framework should also everything else equal be higher more in election years when the government needs to signal fiscal prudence to voters.

A short note on the model's assumptions

In the above model the incumbent government changes fiscal rules stringency due to anticipated reactions from creditors and voters. The incumbent government thus views the strengthening of the national fiscal framework as a tool to signal fiscal prudence to these actors. However, it is important to stress that this does not entail that these signals are necessarily credible for the intended audience. The model's theoretical arguments do not rest on the assumption that fiscal rules and their auxiliary frameworks actually have any causal effect on overall fiscal performance, see Heinemann et al. (2017) for a discussion of this issue, but only on the assumption that national governments perceive them as useful tools to signal fiscal prudence to creditors and voters. An independent theoretical argument about voters' and market and non-market creditors' actual reactions to the strengthening/loosening of the national fiscal framework is a very relevant topic but beyond the scope of this article.

Data and estimation

To test the theoretical model of when governments strengthen their national fiscal rules framework, I use a worldwide panel with the majority of the World's countries from 1985 to 2013. The three central independent variables of interest deriving from the formal model are government debt, the occurrence of an IMF program and a national election which can – at least theoretically – cause government turnover.

Government debt is measured by the government gross debt as a percentage of GDP and is from the IMF's World Economic Outlook. Gross debt rather than net debt is arguable easier and more transparent for government creditors to assess, and this debt variable should thus more than other fiscal variables induce governments to change the national fiscal framework.[7] To test whether national fiscal rules change due to concerns to appease external non-market creditors such as the IMF, I use a dummy for whether the country is currently part of an IMF program.

As the election year variable I construct a dummy *election* dummy, which scores 1 if an election is held which can at least theoretically cause a shift in government. This is defined as a presidential election in presidential systems and a legislative election in parliamentary and semi-presidential systems. Data for both elections and regime classifications are from the World

[7] According to the logic of the formal model, an alternative variable to measure the creditor pressure on national governments to increase fiscal rules' stringency might be total interest payments. However, this variable is not readily available for most countries over time. So I have chosen to stick with general government gross debt as a percentage of GDP as the key measure of credit worthiness pressure.

Bank's Database of Political Institutions (Beck et al. 2001). The data coverage for this database ends in 2012 but all the independent variables are lagged one year so the dataset's coverage extends to 2013, which then defines the end year of the panel.

Measuring strength of fiscal rules

The dependent variable is the overall strength of national fiscal rules and their legal/institutional framework. The data source for the existence and nature of national fiscal rules is the IMF's Fiscal Rules Database, which contain information about both supranational and national fiscal rules in all countries, which had any of these from 1985 and onwards (Bova et al. 2015). I have coded all fiscal rules variables for countries not included in the Fiscal Rules Database to 0, since countries are not included in the database if they have no fiscal rules in place in the above time period. The database distinguishes between four types of fiscal rules (Schaechter et al. 2012, 7-9):

- Debt rules which set limit or target for public debt, typically in percent of GDP.
- Budget balance rules which set guidance and rules for the public budget balance.
- Expenditure rules which set limits for government spending through spending caps or multiyear expenditure limits.
- Revenue rule which set rules for public revenue by ceilings and/or floors for public revenues.

These rules can vary in their statuary basis (from government announcement/official commitment to constitutional basis), scope (general or central government) and coverage (are some types of expenditures/revenues exempt?).

It is worth noticing that the IMF Fiscal Rules Database concerns de-jure fiscal rules and their auxiliary institutions and does not cover whether and to what extent the rules are actually upheld. However, the scope of this article is to investigate when and why governments strengthen their official fiscal frameworks and not whether these rules actually affect government fiscal policy.[8]

To quantitatively measure the combined de-jure strength of a country's national fiscal rules framework, I use a method which is very similar to the approach described by Schaechter et al. (2012, 29-31) and construct a general index of national fiscal rules based on an addition of sub-indexes for the four types of national fiscal rules. The logic is that a combination of several fiscal rules should everything else equal be more efficient (Schaechter et al. 2012, 31). The strength of each national fiscal rules sub-index is based on a simple addition of indicators[9] for each type of rule:

- The legal basis of the rule: Political commitment/coalition agreement/statutory/constitutional.
- Coverage of the rule: Central or general government.
- The existence of formal enforcement procedures.
- The existence of multi-year expenditure ceilings (common for all rules except revenue rule).
- The existence of a Fiscal Responsibility Law (common for all rules).

[8] Confer again Heinemann et al. (2017) for a wider scholarly discussion about this subject.

[9] Each indicator is rescaled to run from 0 to 1 in the case of non-binary indicators. If a country does not receive a score for a given indicator in the Fiscal Rules Database, usually because it has no fiscal rules associated with that indicator in place, the value of the indicator is set to 0.

- Whether an independent body sets budget assumptions (common for all rules).
- Whether an independent body monitors budget implementation (common for all rules).

This addition construct sub-indexes for the strength of the four types of national fiscal rules, which run theoretically from 0-7 in the case of debt, balanced budget and expenditure rules and 0-6 in the case of revenue rules. Before the final addition the sub-indexes are rescaled to run from 0-5.[10] The overall fiscal rules index is also rescaled to run theoretically from 0 to 5. This method is also the inspiration for the index constructed by Bergman and Hutchison (2015, 84-85), who however construct their fiscal rules index in a somewhat different way.

Control variables

In the later statistical specifications, I control for a number of potential confounders of both changes in government debt and elections. One is GDP growth from the World Bank's Database, which measures both positive and negative fluctuations in growth. The occurrence of economic crises - and perhaps economic booms - are endogenous to government fiscal crises, which normally includes rising debt to GDP, and both economic and fiscal crises in general might influence the fiscal institutional framework (Hallerberg and Scartascini (2015). As both level of democracy and economic development might influence government institutional quality including in areas related to fiscal governance (de Renzio and Wehner 2013), I include log of

[10] Since the indicators, multi-year expenditure ceilings, Fiscal Responsibility Law, independently set budget assumption and independently monitored budget implementation are common for all or most of the sub-indexes the final index give relatively high influence to these indicators.

GDP per capita and level of democracy measured by the polity2 score. GDP per capita comes from the World Bank's Database, while the polity2 score is from the PolityIV project's website.

As a further political control, I include whether the chief executive is from a leftwing party as defined by the Database of Political Institutions. While some scholars (Hallerberg and Scartascini 2015) have found no effect of incumbent ideology on fiscal institutional change, the classic view from the literature on partisan preferences could suggest that leftwing parties will hold more pro public spending views[11] and would be less inclined to tighten fiscal rules as a consequence.[12]

As a final control variable, I include whether the country is part of a formal currency union based on data from the IMF's Fiscal Rules Database and manually updated for countries missing in this database. Currency unions often come with at least supranational fiscal rules, such as the EMU's Stability and Growth Pact, which may or may not spill over into the national fiscal framework. Descriptive statistics for all variables can be found in table 1.

[11] Although the empirical evidence for this assumption is more mixed and perhaps not unconditional (Imbeau et al. 2001).

[12] Evidence from European Union countries however suggests that under some circumstances leftwing parties could be more prone to implement budgetary reforms (Fabrizio and Mody 2010).

Table 1. Descriptive statistics

Variable	Mean	Std. Dev.	Min	Max	Observations
Fiscal rules index	0.23	0.53	0	3.11	2974
Debt rules index	0.38	1.02	0	6.5	2974
Budget balanced rules index	0.40	0.92	0	5.6	2974
Expenditure rules index	0.31	0.85	0	5.6	2974
Revenue rules index	0.16	0.50	0	3.4	2974
General government gross debt	57.92	51.09	0.00	786.44	2974
Under IMF program	0.30	0.46	0	1	2974
Election	0.20	0.40	0	1	2974
GDP growth	4.18	6.04	-62.08	149.97	2896
Log of GDP per capita	8.24	1.65	4.73	11.36	2884
Polity2	3.75	6.61	-10	10	2673
Leftwing chief executive	0.30	0.46	0	1	2918
Currency union	0.27	0.44	0	1	2961

Estimation

The estimation method used to test the theoretical model is OLS with country-fixed effects. Fixed effects enable me to analyze deviations from country averages both in terms of the score on the fiscal rules index and the independent variables and to hold country-specific idiosyncrasies constant. Year-fixed effects are also added to control for the general trend towards tighter fiscal frameworks in the analyzed time period (Schaechter et al. 2012, 10-12), which might otherwise be spuriously correlated with a trend in the level of government debt. As most formal changes to legal frameworks and institutional settings are normally agreed upon, potentially voted on in parliament and publically announced at least the year before they take effect, all independent variables are lagged one year. The regression equation can be found in equation 23, where $Index_{it}$ is the score on the aggregate fiscal rules index in country *i* at time *t*. *Gov.Debt*, *IMF* and *Elec.* are the three key independent variables, while *X* is a vector of controls. γ_t and δ_i are the years- and country-fixed effects respectively, and ε is the error term.

$$Index_{it} = \beta_1 Gov.Debt_{it-1} + \beta_2 IMF_{it-1} + \beta_3 Elec._{it-1} + \beta_4 X_{it-1} + \gamma_t + \delta_i + \varepsilon_{it} \qquad (23)$$

In all estimations standard errors are clustered at the country level to address issues of autocorrelation.

Empirical results

The results for the main test of the theoretical model can be found in table 2. In column one the fiscal rules index is regressed on the two main predictors of its strengthening following from the formal model, general government gross debt and the occurrence of an election, without any controls. The results show evidence in favor of the theoretical model. The sign of the coefficient of the government debt variable is positive and statistical significant at the $p<0.05$-level, which provides evidence in favor of the creditor signaling argument. Turning to the IMF program dummy, while being under an IMF program has the expected positive effect, this effect is not statistically significant at conventional levels. There is thus less robust evidence in favor of the argument that national governments strengthen national fiscal framework as a consequence of IMF involvement, which should be expected from the theoretical model. However, this empirical finding is more in line with previous studies, which have found no or even negative effects of IMF involvement on the tightening of fiscal institutions (Hallerberg et al. 2009, 145-157; Hallerberg and Scartascini 2015). Concerning the effect of elections, the election variable also has the expected sign and is statistical significant at the $p<0.10$-level. National fiscal frameworks do indeed seem to be more stringent when debt levels are high and in election years in line with the implications of the theoretical model, while being under an IMF program does not seem to statistically significantly affect fiscal rules stringency.

In columns two to five the different control variables are included one by one. In column two GDP growth has a negative size effect, which is in line with the argument that governments do not strengthen fiscal rules in times of economic booms and might be more inclined to do so in times of economic crisis.[13] The effect however is far from statistically significant.[14] In columns three and four log of GDP per capita and level of democracy are added to the specifications. Neither seem to have any statistically significant impact on fiscal rules stringency. Finally, the dummy for whether the chief executive is from a leftwing party is added to the specification in column five. The partisan variable is highly statistically insignificant, which suggest no partisan effect on the strengthening of the national fiscal rules framework. While some scholars have found partisanship significantly associated with differences in fiscal institutions at the subnational level (Alt et al. 2006; and Guillmòn et al. 2011), when it comes to cross-national fiscal rules stringency, partisanship does simply not seem to matter.

The inclusion of the various control variables does not fundamentally change the coefficient size or the statistical significance of the government debt and election variable. There is thus robust evidence in favor of the theoretical argument that national governments use the strengthening of fiscal rules and their auxiliary institutions as signaling tools of competence and concern with

[13] The empirical evidence of the more general crisis-induces-reform-argument is somewhat mixed in many areas of economic policymaking, see Drazen and Easterly (2001).

[14] As evident from table 1 during the course of the analyzed time period some of the countries experience very extreme values on the GDP growth variable. However removing observations above 10 percent and below minus 10 percent on the GDP growth variable do not change the results from table 2 column 2 except that the election variable increases its effect size and level of statistical significance. Results are available upon request.

fiscal policy to both creditors and voters. In appendix A, the sub-indexes measuring each individual type of fiscal rules are analyzed separately, which with some variation also show support for the basic theoretical arguments in line with the results from table 2.

Table 2. Main results

	(1)	(2)	(3)	(4)	(5)
General government gross debt	0.0011 (0.0004)**	0.0010 (0.0004)**	0.0009 (0.0004)**	0.0011 (.0005)**	0.0011 (0.0005)**
Under IMF program	0.0446 (0.0343)	0.0493 (0.0339)	0.0397 (0.0334)	0.0578 (0.0368)	0.0544 (0.0368)
Election	0.0158 (0.0091)*	0.0172 (0.0092)*	0.0172 (0.0092)*	0.0185 (0.0099)*	0.0180 (0.0103)*
GDP growth	-	-0.0004 (0.0008)	-0.0006 (0.0009)	-0.0004 (0.0009)	-0.0004 (0.0009)
Log of GDP per capita	-	-	-0.0084 (0.0770)	-0.0423 (0.0691)	-0.0382 (0.0708)
Polity2	-	-	-	-0.0062 (0.0050)	-0.0058 (0.0051)
Leftwing chief executive	-	-	-	-	-0.0291 (0.0550)
Country-fixed effects	Yes	Yes	Yes	Yes	Yes
Year-fixed effects	Yes	Yes	Yes	Yes	Yes
Number of countries	169	168	165	151	150
Number of observations	2974	2896	2876	2588	2534
Within R-squared	0.1515	0.1550	0.1540	0.1758	0.1699

Notes: Dependent variable is Fiscal rules index. All independent variables are lagged one year. Country-clustered standard errors in parentheses. *: p<0.10, **: p<0.05, ***: p<0.01.

In the main test of the article's theoretical model in table 2, the effect of an election is assumed to be independent of other institutional factors. However, in accordance with the arguments from the theoretical section the effect of an election might depend on the extent to which the election can actually cause the incumbent government to lose office. Consequently the level of democracy might matter for the size of the election effect. To address this issue, in appendix B the estimation from table 2 are redone with the addition of an interaction between election and the level of democracy. These results again show evidence in favor of the model but suggest that

the effect of the election variable is contingent on the level of democracy and thus the extent to which an election can ouster an incumbent government, which follows the logic of the article's theoretical model.

Role of IMF explored further

The weak effect of the IMF program variable in table 2 suggest that the effect of IMF involvement on the strengthening of national fiscal rules framework might be shakier than expected from the view of IMF as a creditor which governments would try to appease by strengthening the national fiscal framework. There could be several explanations of this weak result. One would be that the weak results is due to the fact that there is often weak formal requirements of the different IMF programs, which is partly due to non-fiscal-related political reasons for countries getting IMF support (Dreher et al. 2015). To use the terminology of the model from the theoretical section the IMF's risk aversion might be zero or very close to zero in the case of a pro-funding bias towards some countries receiving IMF funding, which would make the incentive to increase fiscal rule stringency similar between governments receiving IMF funding and those countries not receiving these funds.

Another argument brought forward by among others Hallerberg et al. (2009, 150) could be that the access to IMF funding, which is normally supplied with below market interest rates, might sometimes decrease the incentive to strengthen fiscal institutions. This argument suggests that the special role of the IMF as a creditor could work simultaneously to both tighten the national fiscal framework, as a stricter fiscal framework could be part of the conditions for getting IMF

loans but also to loosen the national fiscal framework, as IMF funding relieves a government of some of the need to appease market creditors. Furthermore previous IMF programs might convince governments that the IMF would be willing to supply further funding in the future. In the terminology of the model from the theoretical section having had past IMF programs might decrease the perceived risk aversion of the IMF with regards to providing non-market loans to the country in question, since they have already provided these in the past. These perceptions would then lower the government's incentive to increase fiscal rules' stringency. These dual effect could explain the weakness of the IMF program dummy variable. These arguments would also still be in line with the article's overall theoretical argument that governments use the strengthening of fiscal rules as a signaling tool to both creditors and voters, when they need to appear fiscally responsible to these actors.

To further explore the potential dual effects of IMF programs, I include a dummy in the estimation for whether the country has ever been in an IMF program to see whether there is a separate effect of previous IMF involvement as opposed to present IMF involvement. The results can be seen in table 3 columns one and two. The dummy variable, which measures whether the country has ever been under an IMF program, has a negative sign and a rather large size effect, as it decreases the score on the fiscal rules index with over half a standard deviation. It is also highly statistically significant at a $p<0.01$-level. The strong negative effect of previous IMF involvement suggests that countries, which have previously been under an IMF program, are less likely to strengthen their fiscal framework. This finding could in line with the arguments above be due to moral hazard issues involved in IMF programs, as countries which have previously

gotten IMF support expect to receive future bailouts[15] which might then relieve the pressure to strengthen the fiscal framework

When both current and previous IMF programs are analyzed together in column two, the results seem to reveal this pattern of a dual role of IMF programs on national fiscal framework. The dummy for previous IMF program(s) is still highly statistically significant with a negative and substantial size effect, while the dummy variable measuring current IMF involvement is positive and statistically significant at a $p<0.10$-level. The IMF as an external creditor seems to have an influence on national fiscal framework, but the effect is both direct positive through current programs and indirect negative through past programs, with the effect of the former being actually dwarfed by the latter. National fiscal frameworks might become more stringent during an ongoing IMF program perhaps due to formal requirements by the IMF during the program, but afterwards issues of moral hazard, and perhaps national resentment to policies associated with the IMF, might relieve the pressure to further strengthen national fiscal framework.

[15] The existence and extent of moral hazard issues in IMF lending is a large scholarly discussion, see Corsettia et al. (2006) and Lee and Shin (2008).

Table 3. The role previous IMF programs

	(1)	(2)
General government gross debt	0.0012 (0.0006)**	0.0012 (0.0005)**
Election	0.0192 (0.0104)*	0.0191 (0.0104)*
Under IMF program	-	0.0723 (0.0374)*
GDP growth	-0.0006 (0.0009)	-0.0004 (0.0009)
Log of GDP per capita	-0.0559 (0.0691)	-0.0315 (0.0710)
Polity2	-0.0053 (0.0052)	-0.0058 (0.0052)
Leftwing chief executive	-0.0321 (0.0549)	-0.0279 (0.0546)
Ever under IMF program	-0.3404 (0.0895)***	-0.4054 (0.1006)***
Country-fixed effects	Yes	Yes
Year-fixed effects	Yes	Yes
Number of countries	150	150
Number of observations	2534	2534
Within R-squared	0.1719	0.1756

Notes: Dependent variable is Fiscal rules index. All independent variables are lagged one year.
Country-clustered standard errors in parentheses. *: p<0.10, **: p<0.05, ***: p<0.01.

The rule of currency unions

Involvement of the IMF seems to have both a positive and a negative effect on fiscal rules' stringency, which could be explained by the creditor signaling model from the theoretical section. However, another source of international influence on national fiscal framework might be currency unions, which often comes with at least official supranational fiscal rules like the Stability and Growth Pact in the Eurozone. The question is whether these supranational rules

spill over into national fiscal rules.[16] To test this in table 4 I redo the estimation from table 2 column five adding a dummy for whether the country is part of a currency union. In direct opposition to the spillover hypothesis, membership of a currency union decreases the score on the fiscal rules index with about one standard deviation. The effect is strongly statistically significant with a p-value below 0.01. However the estimation method uses country-fixed effects so the majority of the panel's countries with any variation on the currency union variable are countries which entered the Eurozone at some point during the analyzed time period.[17] In order to check whether the currency union effect is just a proxy for EU membership I control for EU membership in both columns two and three. While the coefficient for the EU membership dummy is positive it is not statistically significant and the strong negative effect of currency union membership remains.

[16] The 2012 Fiscal Compact of the EMU specifically states that its principles and rules should be implemented in national law, but whether and how supranational rules of currency unions more generally spill over into national fiscal rules is a more open question.

[17] Most of the other large currency unions in the panel, including the CFA franc currency union, experience little to no changes in membership in the analyzed period according to the information in the IMF Fiscal Rules Database.

Table 4. The role of currency unions

	(1)	(2)	(3)
General government gross debt	0.0012 (0.0005)**	0.0011 (0.0005)**	0.0012 (0.0005)**
Under IMF program	0.0605 (0.0368)	0.0568 (0.0364)	0.0615 (0.0364)*
Election	0.0191 (0.0103)*	0.0188 (0.0102)*	0.0194 (0.0102)*
GDP growth	-0.0004 (0.0009)	-0.0003 (0.0009)	-0.0003 (0.0009)
Log of GDP per capita	-0.0338 (0.0720)	-0.0326 (0.0711)	-0.0330 (0.0717)
Polity2	-0.0060 (0.0052)	-0.0056 (0.0051)	-0.0058 (0.0052)
Leftwing chief executive	-0.0251 (0.0544)	-0.0253 (0.0551)	-0.0250 (0.0547)
Currency union	-0.5164 (0.1049)***	-	-0.5121 (0.1061)***
EU membership	-	0.1810 (0.1957)	0.1741 (0.1982)
Country-fixed effects	Yes	Yes	Yes
Year-fixed effects	Yes	Yes	Yes
Number of countries	150	150	150
Number of observations	2523	2523	2523
Within R-squared	0.1712	0.1667	0.1724

Notes: Dependent variable is Fiscal rules index. All independent variables are lagged one year. Country-clustered standard error in parentheses. *: p<0.10, **: p<0.05, ***: p<0.01.

The results from table 4 could suggest that currency membership lowers the pressure for signaling fiscal competence to market creditors. In the terminology of the creditor signaling model currency union membership, and perhaps the supranational fiscal rules associated with these, serve as a substitute for national fiscal rules stringency[18] and would then decrease the

[18] A commenter on a previous version of this article suggested that since entering a currency union and the introduction of these unions' fiscal rules happen for countries at the same point of time, the use of year-fixed effects might hide the effect of currency union membership. However, running the estimations from table 4 without year-fixed effects still shows a statistically significant negative effect of currency union membership on the fiscal rules index. Results are available upon request.

pressure on national governments to strengthen fiscal rules, as currency membership is in itself a signal about creditworthiness or could at least be perceived by such by national governments.[19] A related reason for why currency union membership would relieve the pressure to appease market creditors through national fiscal rules could be that currency union membership would be perceived as a commitment to low and stable levels of inflation, which previous research suggest is a core concern for international financial market actors, see Mosley (2000). These perceptions might then cause national governments to either relax or at least not tighten the national fiscal rules framework after entering a currency union.

The strong negative results of currency union membership on fiscal rules stringency and the non-significant effect of European Union membership thus suggest that European Union monetary integration could have relaxed rather than strengthened its members states' fiscal frameworks[20] due to the arguments stated above. This result would be quite opposite of what was often openly intended by some proponents of the EMU or often just assumed by some of its critics. It remains to be seen whether the 2012 Fiscal Compact, where a stronger national basis for the supranational fiscal rules is an requirement, will have a different longer term effect on European Union countries' fiscal rules frameworks.

[19] The fiscal crisis in the Eurozone seems to suggest that this signal is perhaps not informative or even misleading on a longer term, and empirical evidence suggest that Eurozone membership could even have increased fiscal vulnerability (Dell'Erba et al. 2013).

[20] Research on reforms of Central- and Eastern European countries' budgetary institutions also suggest that reforms to budgetary procedures were also generally less prevalent after EU accession (Hallerberg and Yläoutinen 2010).

All in all, this article's theoretical model, which states that fiscal rules strengthening is used by incumbent governments as a signaling tool both to government creditors and voters, seems to robustly be able to explain at least some of the within-country variation in the stringency of fiscal rules. It also seems able to explain both the dual effect of IMF programs and the paradoxical apparent effect of currency union membership. National fiscal rules stringency seems to evolve as consequence of national governments' concern for positive evaluations of both creditors and voters.

Robustness tests

The above results provide substantial evidence in favor of this article's theoretical model. However some issues might be raised above the robustness and interpretation of the empirical findings, which are addressed in this section. First, it could be argued that GDP growth inadequately controls for the economic situation of the country in question and in column one I therefore add the unemployment rate from the IMF's World Economic Outlook Database as a further control in column one of table 5. However, the inclusion of this variable does not change the core results. Then I employ an alternative measure of elections and replace the election dummy with a measure of time left in the electoral cycle.[21] This variable shows the same substantive findings as the main analysis, the longer until next election the less stringent is the national fiscal framework. An effect which is statistically significant at the $p>0.05$-level.

[21] The variable *ycurnt* from the Database of Political Institutions.

Then there is the issue of outliers. In column three, I remove all observations with debt to GDP over 200 pct., which are the observations which are three standard deviations above the panel mean. However, removing these deviant observations for this main independent variable only increases the effect size of this variable and does not change neither the statistical significance or the effect sizes of any of the other central independent variables. In order to test for the effect of outlying values on the dependent variable, in column four I remove Romania from the analysis. Romania constitutes a very special case for the development of a national fiscal rules framework. Throughout most of the analyzed period Romania scores 0 on the fiscal rules' index but in the years 2010-2013, while Romania was undergoing an IMF program due to a significant worsening of the public finances following the global financial crisis, a number of fiscal institutional reforms were implemented which increased Romania's score on fiscal rules' index dramatically. The result was that Romania by the end of the panel was by far the country with the highest score on the fiscal rules' index with a score of about 3.11, which is over five standard deviations from the panel mean. Thus it could be argued that very sudden experience of Romania within the area of national fiscal rules might be the main driver of some of the above results especially with regards to the effect of current and previous IMF programs.

However, the exclusion of Romania do not change neither the statistical significance or the size effects of the central independent variables. This is even true for the effect of being under an IMF program and the effect of previous IMF programs. Apparently very outlying observations on either the dependent or independent variables do not seem to be driving the empirical results.

Table 5: Robustness tests

	Unemployment	Alternative measure of elections	Excluding observations with over 200 pct. debt/GDP	Excluding Romania
General government gross debt	0.0022 (0.0012)*	0.0013 (0.0007)**	0.0021 (0.0009)**	0.0012 (0.0005)**
Under IMF program	0.0895 (0.0643)	0.0730 (0.0423)*	0.0690 (0.0364)*	0.0674 (0.0367)*
Election	0.0264 (0.0138)*	-	0.0186 (0.0103)*	0.0212 (0.0103)**
Years left in electoral term	-	-0.0070 (0.0033)**	-	-
GDP growth	0.0021 (0.0040)	-0.0002 (0.0012)	-0.0002 (0.0009)	0.0002 (0.0007)
Log of GDP per capita	0.0394 (0.2705)	-0.0640 (0.0774)	-0.0020 (0.0741)	-0.0438 (0.0662)
Polity2	0.0124 (0.0087)	0.0004 (0.0056)	-0.0064 (0.0056)	-0.0063 (0.0052)
Leftwing chief executive	-0.0278 (0.0613)	-0.0201 (0.0548)	-0.0217 (0.0547)	-0.0105 (0.0534)
Ever under IMF program	-0.5497 (0.1642)***	-0.3718 (0.1043)***	-0.3606 (0.0973)***	-0.3243 (0.0878)***
Currency union	-0.5552 (0.1231)***	-0.5052 (0.1057)***	-0.4828 (0.1043)***	-0.4496 (0.0957)***
EU membership	0.1008 (0.2202)	0.1290 (0.2076)	0.1619 (0.2057)	0.1755 (0.2025)
Unemployment	0.0021 (0.0079)	-	-	-
Country-fixed effects	Yes	Yes	Yes	Yes
Year-fixed effects	Yes	Yes	Yes	Yes
Number of countries	92	138	150	149
Number of observations	1,612	2,203	2488	2510
Within R-squared	0.2222	0.1998	0.1779	0.1806

Notes: Dependent variable is Fiscal rules index. All independent variables are lagged one year.
Country-clustered standard errors in parentheses. *: p<0.10, **: p<0.05, ***: p<0.01.

Secondly, I test an alternative explanation for the relationship between upcoming elections and strengthening of the national fiscal rules framework. The core results provide evidence in favor of the voter signaling argument through the positive and statistically significant effect of the election dummy variable. However, an alternative explanation for this result could be that the

effect of an election on the stringency of the national fiscal rules framework represents an attempt by an incumbent government to "tie" the hands of its successor government fiscally rather than a signal of fiscal prudence to voters. A government which might know or be uncertain about whether it will be replaced with another government following an election might have an incentive to increase the stringency of the national fiscal rules just before this election. This should be done in order to prevent its successor from having full discretion over fiscal policy and to "lock in" the incumbent government's own fiscal policy through stricter fiscal rules and/or stronger auxiliary institutions.[22]

To test this argument and thus the alternative explanation for the effect of elections on the stringency of the national fiscal rules framework, in table 6 the lagged election variable is interacted with a dummy which takes the value 1 if a new government has taken office since the year before. The coding of the dummy is based on data from the Database of Political Institutions. If the "tying hands" argument would be the explanation for the effect of upcoming election, we would expect a positive and statistically significant effect of this interaction. An incumbent government would have a greater incentive to "tie" the hands of its potential successor fiscally if the upcoming election is either very close or very certain to end in electoral defeat, which would be more likely if a new government ends up taking office following the election. However, the interaction between the lagged election variable and the newly elected dummy is actually negative and is not statistically significant, while the newly elected dummy has no statistically significant effect either. On the contrary, the election dummy continues to

[22] Such an effect is found for fiscal transparency in US states (Alt et al. 2006).

have a positive and statistically significant effect. These results do not provide evidence in favor of the alternative explanation, that the effect of upcoming elections on the stringency of the national fiscal framework represents an attempt to "tie" the hands of a successor government fiscally rather than a signaling to voters.

Table 6: Alternative explanation for the effect of election

	(1)
General government gross debt	0.0013 (0.0005)**
Under IMF program	0.0771 (0.0370)**
Election	0.0342 (0.0192)*
Newly elected	0.0040 (0.0397)
Election X newly elected	-0.0346 (0.0499)
GDP growth	-0.0003 (0.0009)
Log of GDP per capita	-0.0273 (0.0717)
Polity2	-0.0058 (0.0053)
Leftwing chief executive	-0.0241 (0.0545)
Ever under IMF program	-0.3482 (0.0879)***
Currency union	-0.4552 (0.0956)***
EU membership	0.1704 (0.2007)
Country-fixed effects	Yes
Year-fixed effects	Yes
Number of countries	150
Number of observations	2523
Within R-squared	0.1768

Notes: Dependent variable is Fiscal rules index. All independent variables except "newly elected" are lagged one year. Country-clustered standard error in parentheses. *: p<0.10, **: p<0.05, ***: p<0.01.

The above tests provide evidence of the robustness of the core empirical results and suggest that the article's theoretical model of creditor and voter signaling might be valid in explaining these results.

Conclusion

Why do countries differ in the scope and strength of their fiscal rules, and why do countries change their national fiscal framework? This article has argued that national governments use the strengthening of the national fiscal framework to signal commitment to fiscal discipline to both voters and creditors. Introducing stricter fiscal rules can to be used by a national government in an attempt to assure creditors of the government's commitment to sound public finances, and can also to be used before national elections to signal to voters that the government is fiscally prudent and committed to securing fiscal sustainability in the future. In accordance with these expectations, results from analyses of a worldwide panel of countries show that the stringency of the national fiscal framework tend to be higher when government gross debt is high and in election years, where incumbent governments need to be positively evaluated by voters. The involvement of another potential creditor, the IMF, through lending arrangements seems to have mixed effects. A current IMF program increases the stringency of the national fiscal rules framework, while the experiences of previous IMF lending programs seems to lower fiscal rules stringency. The membership of currency unions decrease the effort to strengthen national fiscal framework, perhaps because governments feel relieved of market pressure when they join a currency union.

The theory and empirics of this article show that within the area of fiscal rules governments need to respond to the dual interests of market actors and domestic voters, as is often the case of economic policymaking. However, in discordance with what is often assumed among policymakers and researchers on these topics (Ezrow and Hellwig 2014), sometimes national governments' incentive to serve both market actors and national voters might turn them in the same direction.

Factors related to both economic forces and national politics apparently shape the evolvement of fiscal rules and their auxiliary institutions. However, the findings of this article do neither prove nor disprove whether fiscal rules and their legal-institutional strength have a causal effect on government fiscal policy. The strengthening of fiscal rules seems to be used as a signaling tool for the fiscal prudence of an incumbent government, but whether a stronger de-jure fiscal framework causally affect the governments' future fiscal policy, or whether they are the fiscal-institutional *cheap talk*, remains a more open question. Endogeneity remains a potential problem in most studies, which tries to access the effect the effect of any institutions perhaps especially fiscal institutions (Hallerberg and Scartascini 2015, 72), and this article has shown that in- and decreases in fiscal rules stringency are potentially caused by political and economic factors which might also be endogenous to fiscal performance. Another question is whether voters actually perceive a government which strengthens the national fiscal framework to be more fiscally responsible and are more likely to reelect such a government, as the government's reasoning in the article's theoretical model rests on. Future research could address these questions.

The results of this article also speak to the wider both scholarly and policy-oriented discussion about the role of international organizations in national fiscal and general institutional reform. The empirical findings of this article suggest that lending and grant arrangements with international organizations such as the IMF might influence national fiscal frameworks but perhaps not as intended. Lending arrangement and grants from international organizations might create moral hazard problems and may convince governments that these sources of funding will be more readily available in the future thus limiting the perceived need to increase fiscal rules stringency to appease both credit markets and the international organizations themselves. Applying this article's theoretical perspective, we should expect this direct positive effect of IMF on fiscal rules stringency to decrease and the negative effect of previous programs to increase the more the IMF is perceived to be biased in favor of the country receiving IMF funding, as previous research suggest can be the case for IMF programs (Dreher et al. 2015). Future research could explore this issue in greater detail

The findings of this article also suggest that the linking of countries through currencies unions might also create moral hazard problem, which might relieve some of the perceived pressure from markets actors on national governments to strengthen their national fiscal frameworks. This argument especially seems to apply to the European Union's Economic and Monetary Union This finding is ironical, as stronger national fiscal framework could potentially relieve some of problems with high interest rates in some of the debt-ridden European Union countries (Dell'Erba et al. 2013; and Heineman et al. 2014). A stronger focus on having national basis for supranational fiscal rules, as is the intent and requirement of the recent Fiscal Compact, might change this paradoxical association in the future. This is already suggested by the fact that a

large number of European Union countries have already implemented the Fiscal Compact's structural deficits requirement into their national fiscal rules framework by 2015 (Bova et al. 2015). However, the longer term implications of these institutional changes remain to be seen.

Finally, while the findings of this article have been statistically robust, the relative modest size effects of the key explanatory variables suggest that they are perhaps not the sole explanations for the variation in national fiscal rules and their auxiliary institutions. The key predictors of the strength of these fiscal institutions might still be missing. Future research could explore potential additional determinants of the strengthening of the fiscal rules framework and the introduction of national fiscal rules further both theoretically and empirically.

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Appendix A. Determinants of fiscal rules strength by sub-indexes

In table 1A the determinants of the strength of the four sub-indexes of the overall fiscal rules index are analyzed. In all specifications the positive effects of both general government gross debt and election remain, although their effect sizes vary. The statistical significance level of the government debt variable falls in all but in the case of budget balance rule and expenditure rule strength. The results lends support to the overall theory that increasing fiscal rule stringency serve as a form of signaling to creditors but suggests that governments are more likely to use some fiscal rules rather than others. The election variable is only statistically significant in the case of budget balance rule strength, where it increases in statistical significance compared to when the strength of the overall fiscal rules index was analyzed, although it borders statistical significance in the case of expenditure rules strength. Being under an IMF program only seems robustly associated with larger fiscal rules stringency in the case of expenditure rule.

These results suggest that the perceived value of using stringency of fiscal rules to signal fiscal prudence to voters is different across types of fiscal rules. It suggest that governments might be more inclined to signal competence by increasing the strength of rules targeted at fiscal policy measures, where some studies have detected that voters respond negatively to increases especially public deficits (Brender and Drazen 2008) and expenditures (Peltzman 1992). Another possible explanation for the lack of effect on the debt and revenue rules indexes might be that the revenue rule variable captures both minimum and maximum revenue targets, where the latter might be perceived by the government to be unpopular among voters. Furthermore if the government is already breaking a potential debt rule, where reaching a numerical target can take considerable time, it might not be interested in drawing voter attention to this area by increasing the stringency of the rule framework in an election year, although increased rules' stringency

might help actually reaching the numerical target. On the contrary governments might perceive bond market actors to have a more nuanced understanding of the introduction and increased stringency of both debt and revenue rules.

Table 1A. Determinants of fiscal rules strength by type of fiscal rule

	Debt rule strength	Budget balance rule strength	Expenditure rule strength	Revenue rule strength
General government gross debt	0.0015 (0.0008)*	0.0018 (0.0009)**	0.0022 (0.0009)**	0.0008 (0.0005)*
Under IMF program	0.0368 (0.0662)	0.0937 (0.0609)	0.1196 (0.0589)**	0.0469 (0.0306)
Election	0.0150 (0.0169)	0.0421 (0.0182)**	0.0285 (0.0211)	0.0130 (0.0108)
GDP growth	-0.0000 (0.0017)	-0.0007 (0.0015)	-0.0006 (0.0014)	-0.0008 (0.0007)
Log of GDP per capita	-0.0089 (0.1669)	-0.0946 (0.1172)	-0.0611 (0.0810)	-0.0425 (0.0543)
Polity2	-0.0099 (0.0088)	-0.0112 (0.0090)	-0.0082 (0.0070)	-0.0025 (0.0042)
Leftwing chief executive	0.0086 (0.1121)	-0.0840 (0.0852)	-0.0112 (0.0689)	-0.0654 (0.0622)
Country-fixed effects	Yes	Yes	Yes	Yes
Year-fixed effects	Yes	Yes	Yes	Yes
Number of countries	150	150	150	150
Number of observations	2534	2534	2534	2534
Within R-squared	0.1371	0.1777	0.1355	0.1107

Notes: All independent variables are lagged one year. Country-clustered standard errors in parentheses. *: p<0.10, **: p<0.05, ***: p<0.01.

Overall the results support the general theory of fiscal rules a s signal to creditors and voters but suggest that the governments might be more inclined to use the introduction and increased stringency of budget balance rules as a signaling tool to voters rather than other types of fiscal rules.

Appendix B: Election effect as contingent on democracy

The results from the main analysis provides evidence in favor of the signaling model. A key feature of the model is that the mechanism behind the positive effect of an upcoming election on the stringency of the fiscal rules framework is the incumbent government's incentive to win the election. However if the political system of the country de-facto does not make it possible for incumbent government to be removed as a consequence of elections or if elections are generally rigged so that the incumbent cannot de-facto lose the election, this mechanism might not hold or might at least be weakened. First and foremost this would be the case in more autocratic types of regimes and would entail that the effect of an election on fiscal rules' stringency would be most prevalent in electoral democracies. In non-democratic regimes elections and sometimes their results are potentially influential for an incumbent autocratic regime and might thus shape incumbent behavior (Gandhi and Lust-Okar 2009), but it would still be plausible that the re-election incentive would be much more stronger in more democratic regimes. Taking these perspectives we should expect that the effect of an election on fiscal rules' stringency would be contingent on the country's level of democracy.

To test whether the election effect could be contingent on the democratic status of the country in table 1B the full estimation from table 2 is redone and the election variable is interacted with the polity2 variable, which is augmented to run from 0 to 20 instead of -10 to 10, in order to prevent negative values. The results can be seen below.

Table 1B. Interaction between democracy and election

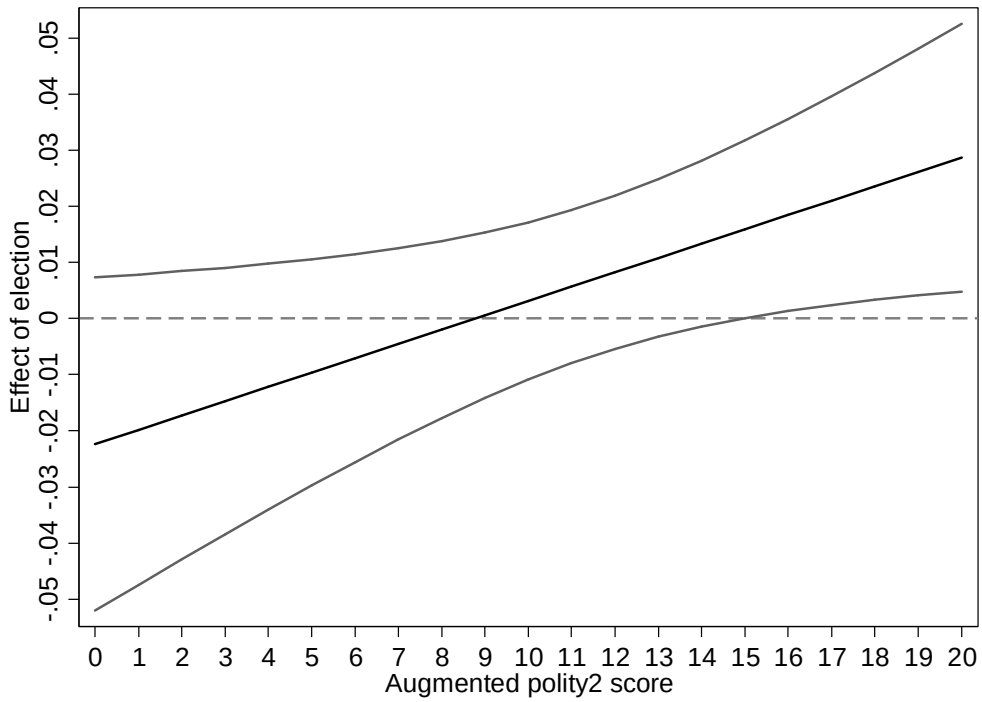
	(1)
General government gross debt	0.0011 (0.0005)**
Under IMF program	0.0542 (0.0368)
Election	-0.0224 (0.0180)
Augmented polity2	-0.0061 (0.0051)
Election X augmented polity2	0.0025 (0.0014)*
GDP growth	-0.0004 (0.0009)
Log of GDP per capita	-0.0382 (0.0707)
Leftwing chief executive	-0.0290 (0.0550)
Country-fixed effects	Yes
Year-fixed effects	Yes
Number of countries	150
Number of observations	2534
Within R-squared	0.1701

Notes: Dependent variable is Fiscal rules index. All independent variables are lagged one year. Country-clustered standard errors in parentheses. *: p<0.10, **: p<0.05, ***: p<0.01.

The results from table 1B do indeed suggest that the effect of an election on fiscal rules' stringency is contingent on the level of democracy. The interaction between the election variable and the augmented polity2 score has a positive size effect, which is statistically significant at the 0.10-level. Apparently as level of democracy increases so does the positive effect of an election on the stringency of fiscal rules. Regarding the other explanatory variables the level of general government debt retains its size effect and level of statistical significance from table 2, while none of the other variables have a statistically significant effect on the fiscal rules index.

The results again provides evidence in favor of the article's theoretical model, which argues that reelection seeking governments use the strengthening of the national fiscal rules framework to signal fiscal prudence to voters. But in line with the proposed mechanisms of the model, this election effect is contingent on whether the election can plausibly cause a shift in government and is thus contingent on the country's level of democracy. A visualization of the effect of an election contingent on level of democracy is shown in figure 1B. It again shows that the presence of electoral democracy is indeed a prerequisite for an election to have a positive effect on the stringency of the fiscal rules framework. Only in countries with the highest levels on the augmented polity2 does an election with the theoretical prospect for government shift statistically significantly cause an a higher level of stringency of the national fiscal rules framework.

Figure 1B. Effect of election contingent on level of democracy



Note: Outer lines show 90 pct. confidence intervals.