RULES AND RISK IN THE EURO AREA

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Highlights

- With a unique data set summarising the quality of rules-based fiscal governance in European Union member states, we show that stronger fiscal rules in euro-area members reduce sovereign

Rules and risk in the euro area

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Abstract

With a unique data set summarizing the qualit of rules-based fiscal governance in EU member states, e sho   that stronger fiscal rules in euro area members reduce sovereign risk premia, in particular in times of market stress. To do so, e develop

trust of investors in such a commitment may be enhanced by a strong fiscal framework (Fatás, 2010) and the framework may help anchor fiscal policy expectations (Leeper, 2010). Indeed, strengthening national fiscal governance is an important item both of national reform agendas in the euro area [2] and the economic governance reform at the EU level (European Commission, 2010).

We investigate whether national fiscal governance and numerical fiscal rules in particular help contain the interest required on government bonds. Specifically we propose and test a model of sovereign yield spreads that accounts for risk aversion. We argue that fiscal governance has an impact on the sovereign yield spreads by reducing the probability of default. This has a twofold non-linear effect on the sovereign spreads: first, it determines the standard risk premium that compensates for the possibility of default no matter what the extent of risk aversion is. Second, it determines the variance of the payments from the risky bond. Markets will ask for a compensation for assuming the risk associated with this variance; this second component is amplified with risk aversion. Using a unique dataset on fiscal governance in EU member states, we provide empirical support to our model and specifically to the restrictions implied by it. We find strong and economically sizeable effects of the quality of national rules-based fiscal governance on sovereign spreads. We further show that the legal base of the rules appears to be the most important dimension of their effectiveness in containing sovereign risk premia, while the mechanisms to enforce compliance are highly important as well. The type of the bodies in charge of supervising compliance with the fiscal rules, in turn, appears to matter less.

Numerical fiscal rules are defined as permanent constraints on summary indicators of fiscal performance, such as the budget deficit, debt, or a major component thereof (Kopits and Symansky, 1998). They are aimed at reducing the policy failures due to which budget process outcomes tend to be biased towards deficits: namely, the common pool problem of governments without centralised spending powers, the short-term orientation of governments due to short electoral cycles, and the possible short-term orientation of voters. In the

ical fiscal rules for sound public finance. While earlier research concentrated on the experience of the US states, sometimes in view of deducting insights for the nascent EMU (von Hagen, 1991; Bayoumi and Eichengreen, 1995; Alesina and Bayoumi, 1996; Bohn and Inman, 1996), the focus of analysis then shifted to Europe. The effectiveness of national fiscal rules with respect to fiscal performance has been shown to depend on the mechanisms established to enforce compliance with the rule (Inman, 1998; Ayuso-i-Casals et al., 2009) and on the type of the rule: budget balance and debt rules appear to outperform expenditure rules (Debrun et al., 2008) and in fulfilling medium-term fiscal plans presented in the Stability and Convergence Programmes of EU members, which is a central plank of EU budgetary surveillance (von Hagen, 2010). The role of fiscal rules in the budgetary process has been scrutinised as well: empirical evidence is not fully conclusive whether fiscal rules serve as commitment devices to effectively tie the hands of governments not to pursue short-sighted and pro-cyclical budgetary policies (Debrun and Kumar, 2007b; Debrun et al., 2008), or whether they merely have a signalling role and remove information asymmetries between governments and the electorate, without changing the behaviour of governments (Debrun and Kumar, 2007a; Debrun, 2006). On the EU level, fiscal rules have been shown to be effective, but to lead to significant creative accounting aimed at their circumvention (von Hagen and Wolff, 2006; Buti et al., 2007). Theoretically, it has been elaborated that supra-national rules are welfare improving relative to merely national regimes, but that they cannot fully eliminate the deficit bias, which calls for strong national rules in addition to the supra-national ones (Krogstrup and Wyplosz, 2010).

The past several years witnessed a surge of research on the impact of fiscal variables on spreads in government bond yields as well. In an international context, a positive relationship between public debt and interest rates has been consistently confirmed (Edwards, 1986; Alexander and Anker, 1997; Lemmen and Goodhart, 1999; Lonning, 2000; Copeland and Jones, 2001; Codogno et al., 2003). In the euro area, sovereign spreads are found to be determined by debt, deficits, and debt-service ratios (Bernoth et al., 2004) as well as by hidden fiscal policy activity, creative accounting practices, and transparency of government budgeting (Bernoth and Wolff, 2008). On the sub-national level, the price of public debt is confirmed to reflect fiscal fundamentals (Schuknecht et al., 2009; Heppke-Falk and Wolff, 2008; Schulz and Wolff, 2009). The impact of risk perceptions has also received significant attention by important research (Codogno et al., 2003; Favero et al., 1997; Barrios et al., 2009) and more recent research has looked into variations in time in the weight of various determinants (Bernoth and Erdogan, 2010).

The impact of fiscal restraints on the cost of public borrowing has been studied by looking at US states. Bayoumi et al. (1995) show that the impact of

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$E(I_i) = -(1 + v)\delta_i + (1 - \delta_i)v_i$. We assume $E(I_i) = 0$: purchasing country i's sovereign bonds is actuarially neutral. This implies for the compensation for the possible event of default:

$$v_i = (1 + v)\frac{\delta_i}{1 - \delta_i} = (1 + v)\omega_i; \tag{1}$$

where $\omega_i = (\delta_i)/(1 - \delta_i)$ is the odds of default.

We further assume that investors' utility functions are twice differentiable and strictly increasing, i.e. $U'(X) > 0$. Risk-averse investors specifically have concave utility functions, i.e. $U''(X) < 0$. From the condition of indifference between purchasing bonds of country i and the certainty equivalent to such activity, the Arrow-Pratt measure of the risk premium π_i can be established as [3]

$$\pi_i = 0.5\,\gamma\,\sigma_i^2; \tag{2}$$

where γ is the coefficient of absolute risk aversion, and σ_i^2 is the variance of outcomes from holding country i's sovereign bonds. The variance, in turn, is

$$\sigma_i^2 \equiv E(I_i^2) - E^2(I_i) = \delta_i(-(1 + v))^2 + (1 - \delta_i)v_i^2 = (1 + v)^2\omega_i; \tag{3}$$

The risk premium switches signs with the coefficient of risk aversion and is zero in the presence of risk neutrality.

To risk-averse investors, the sovereign bond of country i has to offer an overall excess return s_i over v of v_i (this part is to compensate for the possibility of default) topped up by the risk premium π_i (which is to compensate for accepting the risk). Using expressions (1), (2), and (3), s_i becomes

$$s_i = v_i + 0.5\,\gamma\,\sigma_i^2 = (1 + v)\omega_i + 0.5\gamma(1 + v)^2\omega_i = (1 + v)\omega_i[1 + 0.5\gamma(1 + v)]. \tag{4}$$

Equation (4) shows how the excess yield that country i's sovereign bond offers over the risk-free return v depends on the probability of default, δ_i and more precisely the odds of default ω_i

return, v.[4]

As concerns risk aversion specifically, $\partial^2 s_i / \partial \rho_i \partial \gamma = 0.5(1 - \rho_i)^2 > 0$: the yield spread increases with risk aversion especially in countries with higher default probabilities. For risk neutrality, equation (4) simplifies to the standard approximation equalising the yield spread with the country-specific probability of default: $s_i \approx \rho_i$.

To arrive at our estimating equation, we resort to the standard assumption (Edwards, 1986; Bayoumi et al., 1995, e.g.) that ρ_i is a logistic function of a measure Y_i that in turn linearly depends on a set of exogenous regressors X_i, parameters β, and a stochastic error term ε i.i.d.:

$$\rho_i = P(I = (1 + v)/Y_i) = e^{Y_i}/(1 + e^{Y_i}) \tag{5}$$

with $Y_i = X_i'\beta + \varepsilon_i$.

Inserting (5) into (4), taking logs, and rearranging terms results in

$$\ln(s_i) = v + X_i'\beta + \ln(1 + 0.5\gamma(1 + v)) + \varepsilon_i' \tag{6}$$

As concerns the determinants of the risk of country i's default, these include

role is to correct for persistent deficit bias, thus improving the expected value of the fiscal balance. Second, they can be expected to reduce the variance of expected future deficits as well. This diminishes the probability of default as sustainability-threatening deficits become less frequent. In our model, all determinants of the default probability have a non-linear impact on the sovereign bond spreads. Calculating back from (6) formulated in logarithms to the levels

We also present estimation results where the fiscal rule index is considered predetermined.

as the Bund is considered the benchmark bond in the respective bond market (see e.g. Dunne et al. (2007)).

Our dependent variable *ln_spread* is the log of government bond spread against the German Bund of the above euro area members based on the yield of their 10-year on-the-run fixed coupon bonds obtained from Bloomberg. As an indicator of the debtors' repayment capacity - *balance* and *debt* - data on government debt and deficits from Eurostat are employed. The data are measured in per cent of GDP. Annual averages of the seven-to-ten year US corporate bond spread for the rating category BBB from Merrill Lynch against US treasuries is employed as a proxy for average coefficient of absolute risk aversion among investors.

An innovative element of our research is the inclusion of the index of the strength of numerical fiscal rules *fri* at country level among the regressors. This fiscal rule index has been constructed by the fiscal governance unit of the European Commission's Directorate-General for Economic and Financial Affairs from information on fiscal governance obtained from the EU member states via the Economic Policy Committee of the Ecofin Council of the EU.[5]

The fiscal rule index is based on information on five dimensions describing each fiscal rule in force at the local, sub-national or national level in an EU member state: (1) the statutory base of the rule, (2) room for revising objectives, (3) mechanisms of monitoring compliance with and enforcement of the rule, (4) the existence of pre-defined enforcement mechanisms, and (5) media visibility of the rule. According to a pre-defined scale distinguishing different degrees by which the design of the rule supports its strength along these dimensions, scores are attributed to each of the dimensions for each fiscal rule as shown in Appendix A. To construct the fiscal rule index, these scores are aggregated using weights obtained as averages of 10,000 randomly drawn numbers from a uniform distribution, following the method used by Sutherland et al. (2005). The random weights technique is applied because of the absence of theoretical guidance on the importance of each criterion in the composite index of the strength of fiscal rules. Finally, the indices of the strength of a fiscal rule obtained for each single rule are aggregated to a single comprehensive score per country per year by adding up the indices calculated for each fiscal rule separately, adjusted by the coverage of general government finances by that rule. In the presence of more than one rule covering the same government

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[5] This rich dataset is updated annually; it is accessible to the public at `http://ec.europa.eu/economy_finance/db_indicators/fiscal_governance/index_en.htm`.

sub-sector, the second and third rules obtain weights $\frac{1}{2}$ and $1/3$ to reflect decreasing marginal benefit of multiple rules applying to the same sub-sector of general government. The design of the index is inspired by Deroose et al. (2006). The index is re-scaled to assume values between 0 (minimum) and 10 (maximum). An improvement of the index is achieved by strengthening one or several existing numerical fiscal rules along either of the above dimensions, by introducing new numerical fiscal rules, or by extending the coverage of general government by existing or new rules. Note that the fiscal rule index only considers if there is a numerical constraint to a budgetary aggregate: it does not take into account however if this constraint is realistically binding in reality (e.g., debt rules allowing for a comparatively high debt level are not binding in low-debt countries).

We also analyse the impact of numerical fiscal rules on sovereign bond spreads considering the five above components separately. To this end we apply the same technique of aggregation as for the composite index. Obviously, no weighting is involved in obtaining this set of sub-indices. Table A in Appendix B shows the unconditional correlation between the components of the global fiscal rule index: correlations between pairs of components are typically high. Country sets of rules that are strong by one dimension tend to be strong along other dimensions as well. The correlation between components 1 and 3 of the overall index (referring to the legal base and the body in charge of monitoring and enforcing compliance with the rule respectively) appear to be particular strong. Components 4 and 5 of the overall index (referring to its enforcement mechanisms and media visibility) appear to be less connected to the overall index than components 1 and 2.

Figure 1 shows the development of rules based fiscal governance in the eleven euro area members of our sample, as measured by the fiscal rules index, 1999 to 2009. The strength of the fiscal rules in force in our country of reference, Germany, has been above average and constant at around 7 throughout the period considered.[6]

The strength of the numerical fiscal rules in force in the other euro area coun-

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[6] In the period covered b our sample, German has operated "golden" budget balance rules and rules limiting nominal expenditure gro th for both the federal government; local governments' budgets have been constrained b debt ceilings and a balance budget rule. In the period considered, the target of the nominal expenditure rule as reformulated, that had no impact on the score of the fiscal rule index,

tries ranged between zero (for Greece, that has had no such rule in force) and 9.5 (the Netherlands,[7] unchanged, and Spain as from 2006) and 9.7 (Spain[8] 2003-2005) respectively. Countries with below-average fiscal rule index scores were Ireland, Portugal, and Italy, while the scores of France, Austria, Belgium, and Finland qualified these countries as having stronger fiscal rules than on average. Remarkable changes to the better occurred in the case of France 2006 and 2008 to 2009,[9] as well as Ireland 2004, while the strength of the fiscal rules deteriorated in Finland after 2007 and in Austria in 2009,[10] in particular due to the suspension of rules in force in the course of the economic and financial crisis.
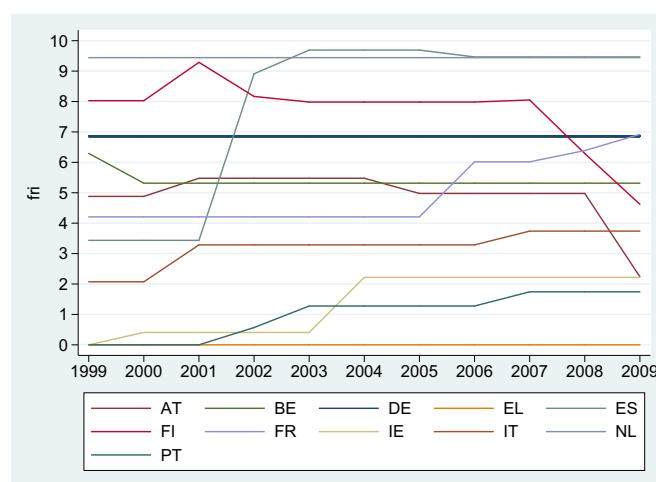

Fig. 1: The fiscal rule index in 11 euro area members, 1999 to 2009

As any index, the index of rules-based fiscal governance applied in our analysis

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constitutes a simplification of complex reality. Despite measurement errors of which an index of this type will inevitably suffer, we argue that it is a useful approximation of reality. Measurement errors affecting the index should be randomly distributed and therefore not affect the basic estimation results. If anything, attenuation due to measurement errors biases coefficients towards zero. Therefore, any significant result can be confidently regarded to corroborate our hypothesis and provide a lower bound of the true effect.

Turning now to the development of the government bond spreads as compared to German Bund yields in the period under review, these spreads were below 30 basis points for most euro area members, with a slight increase until 2001 and decreasing in the period between 2001 and 2006. Sovereign bond spreads mounted and fanned out in the wake of the economic and financial crisis, with particularly high values of 190 basis points reached on average by Greece and Ireland and values between 40 and 100 basis points for the other euro area members during 2009 (see Figure 2). The ranking of the euro area members by the size of the spread of their bond yields against Germany was broadly constant in the period considered, with France, the Netherlands, and Finland being closer to the benchmark and Greece, Italy, Portugal and Spain being at the higher end of the distribution.
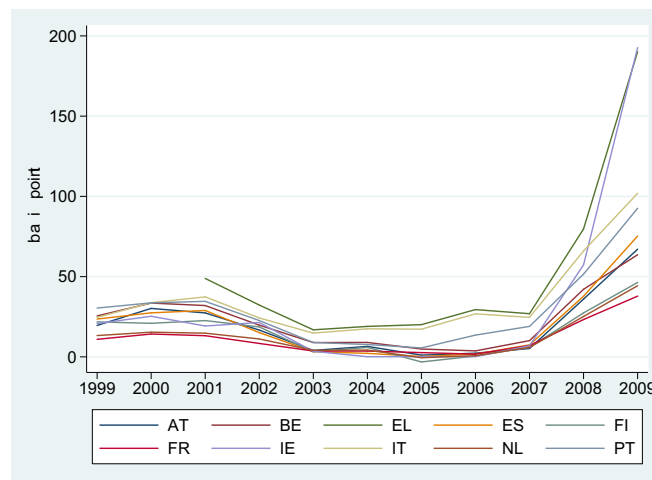

Fig. 2: Sovereign spreads againstere8(00109re8(0ur9re810253(spro)-362(agaa)-362(agm)27(b)-27(ers Irreads   ha7(v)28(7rn322

Fig. 3: Merrill Lynch   S corporate BBB spread, 1999 to 2009

Table B in Appendix B provides the simple correlations of the main variables applied in our analysis. The unconditional correlation between the quality of fiscal rules and the sovereign bond spreads in our sample is negative.

4   Estimation results

We carry out the empirical estimation of the model outlined in section 2 in a dynamic framework using the Arellano-Bond GMM estimator. As we find significant error autorcorrelation when using a static approach, we prefer to show this d GMMeg0G(the)-341.340(yMMeg386(e)-1(st)1(i)-1(ma4i((lwith(w)-354et)27(w)2o(w)-3

lrsatitsimatiothe Tadsuldepharjó(e)+becan827his

		B	C	D	E	F	G	H	I	J	K
debt	0:02	0:03	0:02	0:03	0:03	0:02	0:02	0:03	0:03	0:02	0:03
	(0:01)	(0:01)	(0:02)	(0:02)	(0:02)	(0:02)	(0:02)	(0:01)	(0:01)	(0:01)	(0:02)
balance	0:18	0:14	0:18	0:15	0:17	0:11	0:16	0:19	0:12	0:10	0:12
	(0:05)	(0:05)	(0:04)	(0:05)	(0:07)	(0:10)	(0:05)	(0:05)	(0:02)	(0:04)	(0:06)
ln_riskav	0:90	0:80	0:96	0:88	0:96	0:16	1:03		1:22	1:18	0:79
	(0:13)	(0:15)	(0:13)	(0:13)	(0:11)	(0:34)	(0:11)		(0:14)	(0:11)	(0:15)
yield_de	1:01	1:08	1:01	1:04	0:98	1:41	0:91	0:94	0:84	0:71	1:33
	(0:26)	(0:26)	(0:26)	(0:25)	(0:28)	(0:32)	(0:27)	(0:26)	(0:21)	(0:26)	(0:58)
fri	0:23	0:13	0:31	0:20	0:26	0:30	0:34	0:23	0:13		:13

rules-based fiscal governance will have a much stronger effect on sovereign spreads than in times of lower risk aversion. Likewise, a unit increase in the quality of fiscal governance induces a larger decrease of the sovereign spread in a country with higher deficits and public debt. Figure 4 illustrates this dependency. As can be seen, the higher the level of risk aversion, the steeper the slope of the curve relating the sovereign spread to the quality of rules-based fiscal governance (left panel). At the same time, initial spreads are higher and their decline is consequently higher if deficit and debt are high (right panel). In sum, the benefit from improving rules-based fiscal governance will be highest for countries with weaker budgetary positions and in times of higher risk aversion.
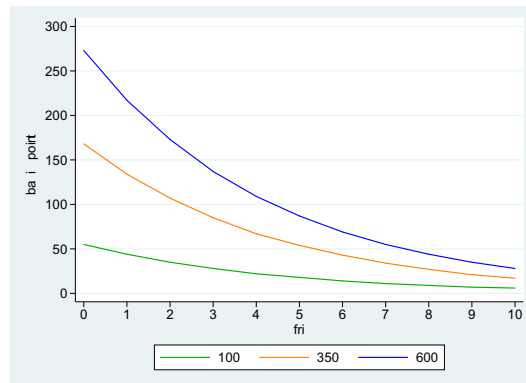
(a) debt: 69~, deficit: 2.6~   (b) debt: 80~, deficit: 4~

Fig. 4: Sovereign spreads at different values of the fiscal rule index and risk aversion, (a) sample average and (b) high-deficit, high-debt example

The effects of the other variables are as expected as well. Sovereign spreads of the euro area countries in the 2000-2009 decade is above all determined by the risk-free interest rate and the level of global risk aversion. Increasing the benchmark interest rate by one percentage point leads to a one percent increase of the spread. A reduction in the general government budget deficit by one percentage point results in a decrease of the spread by around 20 per cent,

a further control variable. The regression reveals that countries with larger banking sectors typically see larger spreads, confirming the findings of Gerlach et al. (2010). In regression C we include the net borrowing of the entire

Table 1 for the year 2009 - when global risk aversion was particularly high - imply the following: in the case of Greece - with a budget deficit of 13.5 per

		B	C	D	E	F
debt	0.02	0.02	0.02	0.02	0.02	0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
balance	0.18	0.18	0.19	0.16	0.19	0.17
	(0.05)	(0.05)	(0.05)	(0.05)	(0.04)	(0.05)
ln_riskav	0.91	0.86	0.90	0.85	0.88	0.82
	(0.14)	(0.14)	(0.14)	(0.12)	(0.15)	(0.16)
yield_de	1.02	1.04	1.05	0.99	1.01	0.94
	(0.25)	(0.27)	(0.26)	(0.27)	(0.22)	(0.21)
fri_1	0.23					0.11
	(0.09)					(0.43)
fri_2		0.13				0.06
		(0.12)				(0.19)
fri_3			0.12			0.20
			(0.10)			(0.38)
fri_4				0.18		0.14
				(0.05)		(0.18)
fri_5					0.20	0.24
					(0.09)	(0.13)
L.ln_spread	0.19	0.26	0.22	0.22	0.24	0.26
	(0.16)	(0.18)	(0.16)	(0.17)	(0.18)	(0.18)
L2.ln_spread	0.40	0.38	0.43	0.32	0.42	0.32
	(0.08)	(0.07)	(0.08)	(0.08)	(0.10)	(0.12)

N = 66

years: 1999   2009

Standard errors in parentheses. ,   ,   denote significance at 10, 5, 1 per cent respectively.

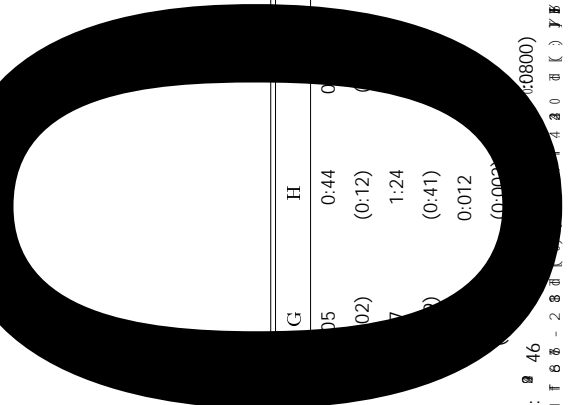Table 2: Estimation results: fiscal rule sub-indices

The economic literature on determinants of sovereigns spreads is typically based on reduced form analysis, without estimating equations directly derived from a structural model. For the sake of comparability, below we also present estimation results from this more standard approach. This exercise also serves as a confirmation of our results presented above. We specifically estimate the following reduced form equation and its variants with further control variables:

$$spread^0_{i;t} = \ _1 risk_t + \ _2 balance^0_{i;t} + \ _3 risk_t balance^0_{i;t} + \ _4 debt^0_{i;t}$$
$$+ \ _5 risk_t debt^0_{i;t} + \ _6 fri^0_{i;t} + \ _7 risk_t fri^0_{i;t} + C^0_i + u^0_{i;t} \quad (9)$$

where $debt^0$, $balance^0$ and fri^0 are considered to determine the probability of default in deviation to the benchmark country, Germany, and risk - the S corporate bond spread -measures investors' risk aversion. The spread is considered to be determined by the risk of default and interaction terms between risk aversion and the other variables that allows capturing the possibility that spreads react differently to fundamentals depending on the state of risk aversion. The estimating equation contains country fixed effects c that capture the effect of time-invariant institutional factors; while $u^0_{i;t}$ is an error term with standard properties. Variables employed in additional specifications are bid-ask spreads of the respective government bonds to control for the risk that assets cannot be sold quickly; the size of the banking sector in the economy to account for contingent liabilities that might draw on public budgets in the event of bank failures, and the three-year projection of deficits obtained from the Stability and Convergence Programmes of the E members to consider the role that fiscal policy expectations might play separately from the room for manoeuvre allowed for by the rules-based governance framework.

Table 3 shows the results of our reduced form regression analysis of the determinants of government bond spreads in the euro area. The results confirm the important role of fiscal rules for sovereign risk premia in the euro area. Fiscal rules do not have a significant explanatory role regarding sovereign bond yields as such (regression A). However, they are highly relevant when investors become risk averse (regressions B to E). When global risk aversion increases, countries with better fiscal rules witness lower increases of sovereign bond yields relative to Germany. Also quantitatively, the results show a similar order of magnitude as in the model-based estimations shown above, as illustrated by Figure 5 as well. We also find that a higher ratio of general government debt to GDP significantly enhances sovereign bond yields, as do higher general government budget deficits.

In line with previous research, we find that international risk aversion is an

	B	C	D	E	F	G	H	J	K	L
risk	0:18	0:14	0:08	0:08	0:08	0:07	05	0:44	0:09	0:08	0:10
	(0:01)	(0:02)	(0:02)	(0:02)	(0:01)	(0:02)	02)	(0:12)	(0:01)	(0:02)	(0:01)
debt0	0:93	0:81	0:75	0:56	0:57	1:40		1:24	0:45	0:73	0:46
	(0:24)	(0:22)	(0:18)	(0:20)	(0:18)	(0:44)		(0:41)	(0:10)	(0:19)	(0:11)
			0:001	0:001	0:001			0:012	0:00	0:00	
			(0:001)	(0:001)	(0:001)				(0:00)	(0:00)	

risk debt0

balance0

important driver of sovereign bond spreads in the euro area itself. When controlling for differences in liquidity across bond markets by including bid-ask spreads (available as of 2003) among the regressors, we continue to find that fiscal rules play a significant role (regressions F and G). Regression H addresses the fact that in many countries the quality of fiscal rules does not change often: the fiscal rule index might pick up other non-observable time-constant factors in these cases. We control for unobservable time-invariant factors that are evaluated differently at different levels of risk aversion with country fixed effects in interaction with risk along with the country effects in levels. Our findings on fiscal rules are preserved in this highly flexible specification.
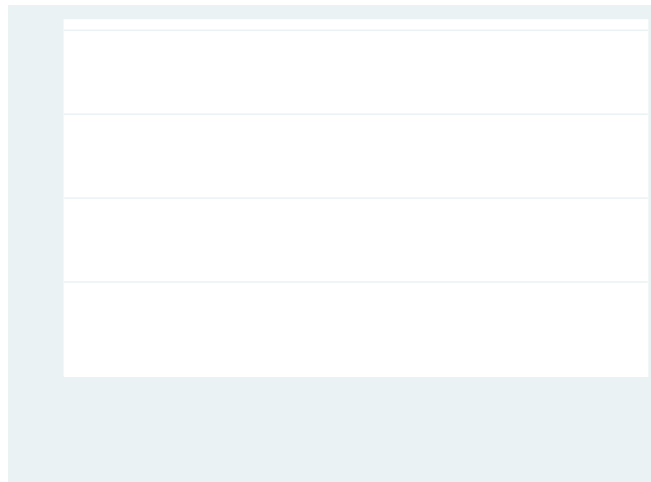

Fig. 5: Marginal effect on fiscal rules on sovereign spreads (table 3, model D)

Regressions I and J omit the year 2009, thereby rendering the regression robust to special effects related to the economic and financial crisis. As argued above, here we can safely consider the quality of rules-based fiscal governance exogenous with respect to government bond yields and their spreads. Qualitatively, the difference to the main specifications presented above is that deficits and debt do not have different impacts on sovereign spreads at different levels of risk aversion. Regression   addresses the role of the banking sector and its potential liabilities to public budgets in the economic and financial crisis by controlling for the size of the aggregate bank assets as a proportion of GDP (relative to Germany). This variable is insignificant; our central results regarding the importance of national fiscal rules for containing sovereign bond yields are again confirmed.

Finally, to rule out the possibility that our fiscal rule index is just a proxy of expectations on the fiscal policy stance but does not shape these, we control for the three year projection of deficits obtained from the Stability and Convergence Programmes of the E   members (regression L). Deficit forecasts

Acknowledgments

1 no regular public monitoring of the rule (no report systematically assessing compliance)

The score of this sub-criterion is augmented by 1 if there is real time monitoring of compliance with the rule, i.e. if alert mechanisms of risk of non-respect exist.

Nature of the bo y in charge of enforcing compliance with the rule

3 enforcement by an independent authority (fiscal council or court) or the parliament

2 enforcement by the ministry of finance or other government body

1 no specific body in charge of enforcement

Dimension 4 (*fri_*4): Enforcement mechanisms of the rule

3 there are automatic correction and sanction mechanisms in case of non-compliance item there is an automatic correction mechanism in case of non-compliance and the possibility of imposing sanctions

2 the authority responsible is obliged to take corrective measures in case of non-compliance or is obliged to present corrective proposals to Parliament or the relevant authority

1 there is no ex-ante defined actions in case of non-compliance

The score of this dimension is augmented by 1 if escape clauses are foreseen and clearly specified.

Dimension 5 (*fri_*5) : Media visibility of the rule

3 observance of the rule is closely monitored by the media; non-compliance is likely to trigger public debate

2 high media interest in compliance, but non-compliance is unlikely to invoke public debate

1 no or modest interest of the media

Appendix B   Additional tables

	fri	*fri_*1	*fri_*2	*fri_*3	*fri_*4
*fri_*1	0.95	1.00			
*fri_*2	0.97	0.91	1.00		
*fri_*3	0.97	0.90	0.95	1.00	
*fri_*4	0.93	0.90	0.90	0.84	1.00
*fri_*5	0.93	0.84	0.86	0.93	0.80

Table A: Correlation across the components of the fiscal rule index

	ln_spread	yield_de	debt	balance	fri
yield_de	0.10 (0.29)	1.00			
debt	0.43 (0.00)	0.07 0.48)	1.00		
balance	0.52 (0.00)	0.42 (0.00)	0.46 (0.00)	1.00	
fri	0.37 (0.00)	0.07 (0.45)	0.34 (0.00)	0.40 (0.00)	1.00
ln_riskav	0.79 (0.00)	0.02 (0.84)	0.09 (0.38)	0.34 (0.00)	0.04 (0.69)

p-values in parentheses.

Table B: Correlation across variables employed in the analysis, 1999 to 2009

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