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Do fiscal rules matter for growth?

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Abstract

We study the relevance of fiscal rules for growth in an EU panel. Our results show that they foster growth, while stricter fiscal rules mitigate the adverse impact on growth from big governments. Moreover, more recent EU member states have gained from the implementation of fiscal rules.

JEL: C23, E62, H60
Keywords: fiscal rules, growth, government size, panel analysis.

1. Introduction

In the context of the European Union (EU), Member States face a fiscal framework that requires the implementation of sound fiscal policies, notably within the Stability and Growth Pact (SGP) guidelines put forward in 1997, encompassing some specific fiscal rules.[1] In fact, institutional restrictions to budgetary decision-making are a common feature of fiscal governance in advanced economies (see Hallerberg et al., 2007, for an overview). In addition to excess spending in the absence of such rules, previous literature also suggests that the so-called "common pool problem" may induce a pro-cyclical bias in fiscal policy (Tornell and Lane, 1999).

Yet another rational for the implementation of such fiscal rules is to prevent policymakers from exacerbating macroeconomic volatility which is known to be detrimental to output growth. Fiscal rules played a relevant role during the fiscal consolidations in the latter part of the 1990s. Well defined and targeted fiscal rules may help in promoting fiscal consolidation and can help attain and safeguard a sustainable fiscal position.

However, the EU Member States' track record of effectively implementing fiscal rules has been mixed. In fact, a study by the European Commission (2006) points to significant

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[1] For instance, Andersson and Minarik (2008) discuss design choices for fiscal rules.

heterogeneity of national fiscal frameworks within the EU and suggests that "stronger" fiscal rules are conducive to sound public finances (and ultimately more efficient and growth-enhancing economic policies).

Therefore, it is relevant to assess whether such fiscal rules, while aiming at improving fiscal positions, also play a role in fostering growth, particularly when interacted with different levels of government size.[2] To our best knowledge such exercise has not yet been conducted, and we contribute to the literature on this front. To this end, we rely on a sample of 25 EU countries from 1990-2008. In a nutshell we find that stricter fiscal rules mitigate adverse impacts on growth stemming from big governments. Another result points to the fact that more recent EU member states, have gained more from the implementation of fiscal rules.

2. Data issues and Econometric specifications

Annual data on real GDP per capita growth (y^{GR}), real GDP per capita lagged (to account for the catching up process) (y_{t-1}) and gross fixed capital formation (*inv*) are retrieved from the AMECO's Database.[3] We include the following 25 EU countries for the period 1990-2008: Belgium, United Kingdom, Denmark, Germany, Greece, Spain, France, Ireland, Italy, Luxembourg, Netherlands, Austria, Portugal, Finland, Sweden, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia and Slovenia. We split our sample into two main groups: *Group1* includes the first 15 countries which correspond to the original EU15; *Group2* includes the remaining 10 which correspond (mostly) to Eastern European states.

For our main regressors of interest, fiscal rules (*R*), we use three indices constructed by the European Commission: overall rule index (*fiscal*), expenditure rule index (*exp*)[4], and budget balance and debt rule index (*bb*). These indices are normalized to have a zero mean and unit variance, and they are based on a survey conducted in the context of the Working Group on the Quality of Public Finances among practitioners and researchers in the field of fiscal policy.[5] These measures bear strong appeal for empirical implementations as they

[2] For a recent survey article on the relationship between government size and economic growth, the reader should refer to Bergh and Henrekson (2011).
[3] These variables are in logs.
[4] Wierts (2008) reports empirical evidence that expenditure rules can limit to some extent the expenditure bias, thus its negative impact on output.
[5] The correlation coefficient of *fiscal* with *exp* and *bb* is 61% and 83%, respectively (statistically significant at the 1% level).

translate a broad set of institutional provisions into a country-specific cardinal ranking (see Debrun at al., 2008, and Afonso and Hauptmeier, 2009 for details).

Finally, our proxies of government size (*g*) will be the Gwartney and Lawson's (2008) composite variable (*govsize*). This variable includes government consumption expenditures (as a percentage of total consumption), transfers and subsidies (as a percentage of GDP), the underlying tax system (proxied by top marginal tax rates) and the number of government enterprises. We also make use of total government expenditures (*totgovexp_gdp*), government consumption (*govcons_gdp*) and, finally, total government debt (*govdebt_gdp*), retrieved from AMECO's Database**.**

For our empirical purposes, we will use both a linear[6] and non-linear specification (in which interaction or multiplicative terms are included), as follows:

$$y^{GR}{}_{it} = b_0 + b_1 y_{it-1} + b_2 k_{it} + b_3 R_{it} + b_4 \ln g_{it} + \varepsilon_{it} \quad (1)$$

$$y^{GR}{}_{it} = b_0 + b_1 y_{it-1} + b_2 k_{it} + b_3 R_{it} + b_4 \ln g_{it} + b_5 (R_{it} * \ln g_{it}) + \eta_{it} \quad (2)$$

where the *b*'s are (unknown) parameters to be estimated, R_{it} and g_{it} denote the fiscal rules and proxies for government size, respectively, *k* is gross fixed capital formation, and ε_{it} and η_{it} are model specific error terms satisfying the usual assumptions of zero mean and constant variance. (1) aims at studying the individual impact of fiscal rules on economic growth, whereas (2) proposes an assessment of whether such rules affect growth differently when the size of the public sector varies.

3. Empirical Results

Equations (1) and (2) can be estimated directly using panel data techniques which allow for both cross-section and time-series variation in all variables and present a number of advantages vis-à-vis standard Barro-type pooled cross-section estimation approaches (see Greene, 2003). We estimate these specifications with Fixed-Effects and with the Arellano-Bover system-GMM estimator, in order to minimize problems related to endogeneity and reversed causality. The latter jointly estimates the equations in first differences, using as instruments lagged levels of the dependent and independent variables, and in levels, using as instruments the first differences of the regressors.[7]

[6] Our econometric specification can be derived algebraically from a (Cobb-Douglas) production function approach.

[7] As far as information on the choice of lagged levels (differences) used as instruments in the differences (levels) equation, as work by Bowsher (2002) and, more recently Roddman (2009) has indicated, when it comes to moment conditions (as thus to instruments) more is not always better. The GMM estimators are likely to suffer

In Table 1 we find statistically significant positive coefficients on the overall rule index (when using government consumption), and the expenditure rule index (when using government expenditure, government consumption, and government debt), meaning that having these fiscal numerical rules in place improves GDP growth for this set of EU countries. Our government size proxies are, in general, negative and statistically significant if included alone in the econometric specification (not shown), which is in line with the literature on the topic for rich countries (see, e.g., Bergh and Henrekson, 2011 for an overview). However they are never significant when they are included jointly with fiscal rules. Results do not change qualitatively if Eq. (1) is estimated with the Arellano-Bover system-GMM estimator (not shown). Additionally, the estimation of (2), via system-GMM,[8] and when fiscal rules are interacted with a relevant government size proxy we loose the statistical significance found earlier (not shown).

[Table 1]

Another exercise worth conducting is to split our sample into *Group1* (EU15) and *Group2*, defined above. Table 2 presents our results for two selected government size proxies - *totgovexp_gdp* and *govcons_gdp* (chosen as a function of the statistical significance of the obtained coefficients). Three remarks are in order: i) both government proxies appear with negative and statistically significant coefficients, although total government consumption only for *Group1*; ii) fiscal rules appear with positive and statistically significant coefficients; and iii) coefficient estimates of *Group2*'s fiscal rules are higher in magnitude vis-à-vis *Group1*'s, translating the fact that more recent EU member states, including most Eastern European economies (characterized by lower GDP per capita, more catching up distance to cover, and lower indebtedness levels) have gained more from such rules.

[Table 2]

We also tested whether a simple splitting rule based on the country-average debt-to-GDP ratio over the entire time period being higher or lower than 60% (in line with the SGP threshold level) matters. Our results (not shown) suggest that the positive effect of fiscal rules is higher for countries which maintained an average debt-to-GDP ratio below 60% over the period. Countries that fall in this category are mainly Eastern and richest European states

from "overfitting bias" once the number of instruments approaches (or exceeds) the number of groups/countries (as a simple rule of thumb). In the present case, the choice of lags was directed by checking the validity of different sets of instruments.

[8] In our system-GMM regressions the Hansen-J statistic is associated with p-values larger than 10%. This statistic tests the null hypothesis of correct model specification and valid overindentifying restrictions, i.e., validity of instruments.

whose sounder fiscal positions allow them to benefit more (in terms of growth) from their larger room for fiscal manoeuvre.

Finally, given that Beetsma and Giuliodori (2010) reported the existence of fiscal policy interdependence for EU countries we have tested for the existence of cross-sectional dependence. To this end we applied Pesaran's (2004) CD test and found the resulting statistic's p-value to reject the null of cross-sectional independence. We also estimated (2) with Driscoll-Kraay (1998) robust standard errors[9] and found that (see Table 3) in the case where the Gwartney-Lawsson's measure and total government expenditures are used as government size proxies, our interaction terms yield a positive and statistically significant coefficient. This means that the positive effect of fiscal rules on GDP per capita growth is stronger at higher levels of government size.[10] Alternatively, the negative effect of larger public sectors is mitigated with stricter numerical fiscal rules.[11]

[Table 4]

4. Conclusion

We assessed for an EU country panel the relevance of fiscal rules for economic growth. We show that fiscal rules foster growth, while stricter fiscal rules also mitigate the adverse impact on growth stemming from big governments, a result robust to government size proxies. Another result points to the fact that more recent EU member states, have gained more from the implementation of fiscal rules. In addition, the positive effect of fiscal rules is higher for countries with average debt-to-GDP ratios below 60%.

Overall, our results imply that having in place a set of fiscal rules, either spending or debt based, this contributes to economic growth. Therefore, we can conclude with an affirmative answer to the title question, while the existence of such rules is also bound to help reducing fiscal imbalances, a paramount issue in a context of scarce public resources and financing.

[9] This non-parametric technique assumes the error structure to be heteroskedastic, autocorrelated up to some lag and possibly correlated between groups.

[10] Driscoll-Kraay estimation results of Eq. (1) instead (not shown), yield negative and statistically significant coefficients for Gwartney-Lawsson's measure, total government expenditures and public debt. Moreover, *bb*, the debt rule index, is found to have positive effects on growth.

[11] For instance, in column (1) in Table 3, we have: $\partial y^{GR} / \partial \ln g = -0.5 + 0.13R$.

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Table 1: Results of Estimations of Eq. (1). Different Government size proxies (EU sample, 1990-2008)

Sample.	**EU**											
Estimation	**Within Fixed Effects**											
Spec.	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*
Gfcf_gdp	0.42**	0.44**	0.43***	0.25*	0.26*	0.23*	0.61**	0.61**	0.58**	0.18	0.19	0.16
	(0.155)	(0.164)	(0.147)	(0.121)	(0.129)	(0.124)	(0.232)	(0.233)	(0.233)	(0.109)	(0.110)	(0.105)
Government size proxy		govsize			Totgovexpp			Govcons			Govdebt	
G	-0.09	-0.07	-0.19	-0.15	-0.16	-0.17	0.66	0.66	0.69	-0.00	-0.00	-0.00
	(0.457)	(0.471)	(0.459)	(0.101)	(0.099)	(0.099)	(0.477)	(0.514)	(0.483)	(0.045)	(0.046)	(0.045)
rules												
fiscal	-0.20			0.43			1.13***			0.47		
	(0.416)			(0.298)			(0.378)			(0.289)		
Exp		0.40			0.55***			0.84***			0.50**	
		(0.374)			(0.145)			(0.285)			(0.177)	
Bb			-0.42			0.19			0.90*			0.30
			(0.369)			(0.345)			(0.480)			(0.321)
Observations	131	131	131	282	282	282	329	329	329	312	312	312
R-squared	0.16	0.17	0.17	0.09	0.11	0.08	0.22	0.21	0.21	0.05	0.06	0.05

Note: The models are estimated by within fixed effects. The dependent variable is real GDP per capita growth. Robust heteroskedastic-consistent standard errors are reported in parenthesis below each coefficient estimate. Time fixed effects were included, but are not reported. Also a constant term and the lagged real GDPpc have been estimated but are not reported for reasons of parsimony. *, **, *** denote significance at 10, 5 and 1% levels.

Table 2: Results of Estimations of Eq. (1). Selected Government size proxies (*Group1* vs. *Group2*, 1990-2008)

Sample	*Group1*						*Group2*					
Estimation	**Within Fixed Effects**											
Spec.	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*
gfcf_gdp	0.23	0.22	0.18	0.18	0.19	0.15	0.38	0.34	0.38	0.66**	0.68**	0.64**
	(0.86)	(0.206)	(0.187)	(0.172)	(0.179)	(0.171)	(0.195)	(0.190)	(0.195)	(0.220)	(0.242)	(0.211)
Government size proxy		Totgovexpp			Govcons			Totgovexpp			Govcons	
g	-0.06	-0.09	-0.09	-0.71*	-0.74*	-0.75*	-0.38*	-0.34	-0.38*	-1.41*	-1.44*	-1.44*
	(0.064)	(0.076)	(0.071)	(0.354)	(0.367)	(0.351)	(0.196)	(0.207)	(0.196)	(0.597)	(0.653)	(0.586)
rules												
fiscal	0.67**			0.48**			1.63***			1.27*		
	(0.267)			(0.204)			(0.337)			(0.625)		
exp		0.61**			0.54**			1.33***			1.47*	
		(0.142)			(0.136)			(0.324)			(0.76)	
bb			0.40			0.23			1.38***			0.88
			(0.340)			(0.237)			(0.285)			(0.527)
Observations	222	222	222	225	225	225	60	60	60	104	104	104
R-squared	0.08	0.08	0.06	0.18	0.20	0.17	0.24	0.20	0.24	0.40	0.40	0.39

Note: The models are estimated by within fixed effects. The dependent variable is real GDP per capita growth. Robust heteroskedastic-consistent standard errors are reported in parenthesis below each coefficient estimate. Time fixed effects were included, but are not reported. Also a constant term and the lagged real GDPpc have been estimated but are not reported for reasons of parsimony. *, **, *** denote significance at 10, 5 and 1% levels.

Table 3: Results of Estimations of Eq. (2) and accounting for cross-sectional dependence. Different Government size proxies (EU sample, 1990-2008)

Sample.	**EU**											
Estimation	**Driscoll-Kraay estimator**											
Spec.	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*
gfcf_gdp	0.11***	0.12***	0.11**	0.09	0.08	0.10*	0.34**	0.33**	0.36**	0.10*	0.10*	0.10*
	(0.008)	(0.009)	(0.007)	(0.057)	(0.055)	(0.060)	(0.154)	(0.146)	(0.158)	(0.052)	(0.054)	(0.048)
Government size proxy		govsize			Totgovexpp			Govcons			Govdebt	
g	-	-	-	-0.11***	-0.12***	-0.09***	0.05	0.06	0.09	-	-	-
	0.50***	0.42***	0.49***							0.02***	0.002***	0.02***
	(0.080)	(0.072)	(0.084)	(0.019)	(0.025)	(0.023)	(0.075)	(0.064)	(0.090)	(0.004)	(0.005)	(0.004)
rule	fiscal	exp	bb	fiscal	exp	bb	fiscal	exp	bb	fiscal	exp	bb
	0.58	2.07***	0.41	1.98***	2.29***	1.52**	0.33	0.09	2.33	0.51***	0.01	0.66***
	(0.354)	(0.344)	(0.301)	(0.649)	(0.780)	(0.599)	(0.852)	(0.416)	(1.510)	(0.107)	(0.234)	(0.055)
interaction	0.13*	0.38***	0.11	0.06***	0.06***	0.05***	0.03	0.00	0.14	0.00	0.00	0.01*
	(0.071)	(0.056)	(0.067)	(0.018)	(0.18)	(0.017)	(0.042)	(0.018)	(0.081)	(0.004)	(0.004)	(0.004)
Observations	147	147	147	298	298	298	347	347	347	347	347	347
R-squared	0.31	0.32	0.31	0.15	0.15	0.13	0.09	0.08	0.10	0.15	0.14	0.15

Note: The models are estimated using Driscoll-Kraay estimator. The dependent variable is real GDP per capita growth. Robust heteroskedastic-consistent standard errors are reported in parenthesis below each coefficient estimate. A constant term and the lagged real GDPpc have been estimated but are not reported for reasons of parsimony. *, **, *** denote significance at 10, 5 and 1% levels.