FISCAL INSTITUTIONS AND PUBLIC SPENDING VOLATILITY IN EUROPE*

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ABSTRACT

This article provides empirical evidence for a sizeable, statistically significant negative impact of the quality of fiscal institutions on public spending volatility for a panel of 23 EU countries over the 1980-2007 period. The dependent variable is the volatility of discretionary fiscal policy, which does not represent reactions to changes in economic conditions. Our baseline results thus give support to the strengthening of institutions to deal with excessive levels of discretion volatility, as more checks and balances make it harder for governments to change fiscal policy for reasons unrelated to the current state of the economy. Our results also show that bigger countries and bigger governments have less public spending volatility. In contrast to previous studies, the political factors do not seem to play a role, with the exception of the Herfindahl index, which suggests that a high concentration of parliamentary seats in a few parties would increase public spending volatility.

1. Introduction

Over the last decades, we have seen a general increase in government budget deficits along with large levels of public debt in most advanced countries. This trend had already been visible in the years preceding the implementation of massive fiscal stimulus, following the eruption of the 2007-08 financial crisis. Focusing on the period up to 2007, the widespread deterioration in fiscal discipline which induced greater fiscal policy volatility cannot be entirely explained by the existence of increasingly larger automatic stabilisers and welfare states. The answer for part of that deterioration and particularly for the rise in volatility appears also to rely on governments' aggressive use of fiscal policy for reasons not related to the current state of the economy.

In fact, what appears to be the norm is that fiscal policy is not conducted by benevolent governments, but rather by politically-motivated executives who do not necessarily share the same preferences as those of the majority of society. We call *discretionary fiscal policy* or simply *discretion* to this way of conducting fiscal policy. This definition is in the spirit of Fatás and Mihov (2003), who define discretionary fiscal policy as the component of fiscal policy that does not represent reactions to changes in economic conditions and that may only reflect exogenous political preferences. This definition excludes other discretionary measures aiming at responding to economic shocks, like government fiscal stimulus measures to boost the economy in recessionary periods. Structural reforms are also excluded from our definition of discretion, as they do not really reflect opportunistic decisions undertaken by governments.

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The literature presents some reasons that might explain why governments resort to discretion in fiscal policy. The opportunistic electoral cycle (Nordhaus (1975)) arises when politicians in power run expansionary fiscal policy in times when it is not necessary, in order to maximise their chances for re-election. Stokey (2003) argues that idiosyncratic changes, incompetence and greediness can define, in some occasions, the path that fiscal policy takes. Finally, the partisan electoral cycle advanced by Alesina (1987), i.e. changes in the ideology of parties in power, also help explain why some countries use more discretion in the conduct of fiscal policy. This aggressive use of fiscal policy would inevitably increase the volatility of public spending with negative consequences for economic growth, as it would produce high uncertainty surrounding the future path of fiscal policies. In this respect, Fatás and Mihov (2003, 2006) document that output volatility is larger in the presence of high levels of discretionary fiscal policy, whereas Fatás and Mihov (2003), and Afonso and Furceri (2010) show that government spending volatility is detrimental to economic growth.

In this context, where the volatility produced by discretionary fiscal policy harms economic growth, what can be done? The answer relies on a growing body of literature, *Political* or *Fiscal Institutions*, that has moved towards strengthening the quality of institutions, that is, the various characteristics of the socio-economic and political setup which considerably shape economic policy (Persson and Tabellini (2001)). The proposals to strengthen the quality of institutions range from measures to increase governments' accountability and policies' transparency, to more far-reaching ones, such as implementing fiscal rules (Debrun *et al*. (2008)) and improving the mechanisms and rules governing the budget process that create checks and balances over public finances (Fabrizio and Mody (2006), and Hallerberg *et al.* (2007)).

Moving forward, in this article we want to find out if there is any link between stronger fiscal institutions and lower values of discretionary public spending volatility. In our opinion, this article adds to the *Fiscal Institutions* strand of literature in four ways. Firstly, we build two major indexes for the quality of institutions to explain cross-country differences in policy volatility. Secondly, we cover the European Union (EU) countries, which offer a larger span of data availability and with better quality. Thirdly, we create panels of 10-year averages for the econometric specification, and this allows us to draw conclusions not only between countries but also over time. Finally, we conduct some robustness tests, particularly by using alternative measures to compute the volatility of discretionary fiscal policy.

In a sample of 23 EU countries in the 1980-2007 period, our baseline results point to a sizeable, statistically significant negative impact of the quality of institutions on public spending volatility, giving support to the strengthening of institutions to deal with excessive levels of discretion volatility. Our results also confirm the findings of Furceri and Poplawski (2008) that bigger countries have less volatility, while bigger governments are also associated with lower levels of volatility. In contrast with Fatás and Mihov (2003), and Afonso *et al*. (2010), the political factors do not seem to affect policy volatility. The exception is the Herfindahl index, which suggests that high concentration of parliamentary seats in a few parties would increase public spending volatility.

The remainder of the text is organised as follows. The next section explains the empirical two-step strategy that will be carried out. Section 3 presents and discusses the baseline results. Under Section 4, we conduct some robustness tests. Finally, Section 5 concludes with the main findings and policy implications, providing some avenues for future research.

2. Empirical strategy

In this section, we study the impact of the quality of institutions on the volatility of discretionary fiscal policy through a two-step strategy. Firstly, we compute a measure of discretionary fiscal policy volatility which does not represent reactions to changes in economic conditions. Secondly, we employ it as the dependent variable against a set of political, institutional and macroeconomic variables. The terms public spending volatility, (fiscal) policy volatility, and discretionary fiscal policy volatility will be used interchangeably throughout the text.

2.1. First-stage regressions: discretionary fiscal policy measure

Our sample covers 23 EU member states over the 1980-2007 period.[1] Using this sample of countries offers several advantages. In particular, we have a larger span of data availability for more variables than those that would be obtained from non-EU countries. In addition, data quality and cross-country comparisons are likely to be of a higher standard. We use annual data from the European Commission AMECO database for all fiscal and macroeconomic variables. Data on the political variables come from the Database of Political Institutions 2006 of the World Bank, and for political instability variables we use the Cross-National Time-Series Data Archive (CNTS).

In the first stage of the empirical strategy, we rely on the pioneering work of Fatás and Mihov (2003) in order to build a measure of discretionary fiscal policy that is driven by political motivations and which does not represent reactions to changes in economic conditions. Though following their econometric approach, we use primary government expenditure as the dependent variable, which is more comprehensive, instead of public consumption. We estimate for each of the 23 EU countries over the 1980-2007 period, the following equation:

$$\Delta log\left(G_{i,t}\right) = \propto_i + \beta_i \Delta log\left(Y_{i,t}\right) + \delta_i \Delta log\left(G_{i,t-1}\right) + \lambda_i Z_{i,t} + \varepsilon_{i,t} \qquad (1)$$

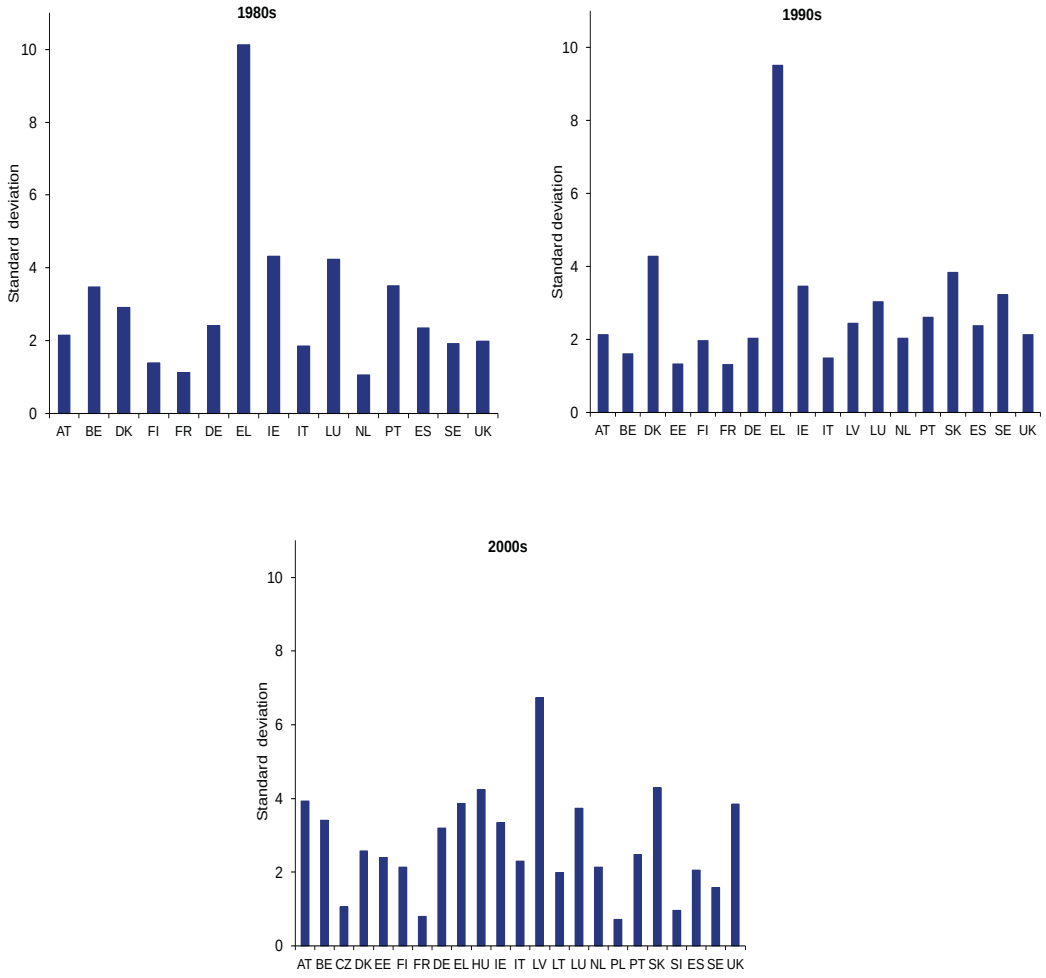
where the residuals ($\varepsilon_{i,t}$) play the most important role, as they capture the variation in government spending that is neither explained by changes in GDP growth, nor by the degree of persistence on its own past values. The volatility is calculated as the standard deviation of the residuals in country *i*, using periods of 10 years, since we want to capture long-term fluctuations in discretionary fiscal policy, removing therefore the noise that is associated with shorter periods. In this context, we interpret the volatility, sigma (σ_i^{ε}),as the typical size of a discretionary change in fiscal policy. Δ is the first difference operator, G stands for real primary government expenditure in country *i* and time t, Y is real GDP, and Z includes a set of control variables, namely, inflation, inflation squared, the logarithm of current and lagged oil spot prices, and a linear time trend. The possible reverse causality bias running from public expenditure via domestic demand to output growth is accounted for by using the instrumental variables (IV) estimator. We use two lags of GDP growth, lagged inflation and the logarithm of oil spot price as instruments for current output growth.

The volatility of discretionary fiscal policy (expressed in standard deviations) for each country and decade, calculated from Equation (1), is shown in Chart 1. In the 1980s, we only have data available for the former EU-15 countries, with policy volatility ranging between a maximum of 10.1 (Greece) and a minimum of 1.1 (Netherlands). Adding one more decade, and including three new countries (Estonia, Latvia and Slovakia), does not significantly change the overall picture. In the last decade, we cover all the 23 countries, where the discretion measure ranges between 6.7 (Latvia) and 0.7 (Poland). Overall, over time, Chart 1 shows a slight downward trend in the use of discretionary fiscal policy across countries, albeit with some exceptions.

1 Bulgaria, Cyprus, Romania and Malta were dropped due either to lack of data or to data availability problems.

Chart 1

VOLATILITY OF DISCRETIONARY FISCAL POLICY BY COUNTRY AND DECADE



Source: Author's calculations.

2.2. Second-stage regressions: determinants of policy volatility

Moving to the econometric specification for the second-stage regression, we include all the variables and controls that might be important to explain cross-country differences in policy volatility. We create a panel of three consecutive, non-overlapping 10-year averages from 1980 to 2007.[2] By using longer periods to average the data, we reduce the vulnerability of the results to the presence of outliers in the data. In addition, with this method of pooling observations, we address the time-variation in our data series. Taking the logarithm of discretionary fiscal policy volatility as the dependent variable, calculated in Section 2.1, we perform the following regression by Ordinary Least Squares (OLS) with panel-corrected standard errors:[3]

2 The first decade goes from 1980 to 1989, the second from 1990 to 1999, and the last decade uses the last 8 years in our data set.

3 The problem of sampling error, as the dependent variable is estimated rather than observed, could lead to higher standard deviations, thus reducing the overall quality of our results. To minimise this problem, we correct the standard errors of the panel by assuming that the disturbances of the variance-covariance estimates are heteroskedastic (each country has its own variance) and contemporaneously correlated across panels (each pair of countries has their own covariance).

$$log\left(\sigma_{i,t}^{\varepsilon}\right) = \propto_{i} + \beta_{i} FRI_{i,t} + \chi_{i} Delindex_{i,t} + \delta_{i} Pol_{i,t} + \phi_{i} Inst_{i,t} + \gamma_{i} M_{i,t} + \theta_{i,t} \quad (2)$$

where the Fiscal rule index (*FRI*) and the Delegation index (*Delindex*) are our proxies for the quality of institutions, which will be discussed in more detail in the next section. $Inst$ contains the proxy for political instability, the variable government crises, which counts the number of times in a year of any rapidly developing situation that threatens to bring the downfall of the present regime. Pol includes all the political variables that shape budget outcomes, namely the nature of the electoral system (assumes the value of 1 for governments elected by proportional representation and 0 by majoritarian circles); the number of parliamentary elections to capture the possible presence of a political budget cycle; an index of electoral competitiveness; and the Herfindahl index that measures the concentration of power in the parties.[4] The vector M comprises the following macroeconomic variables: the logarithm of GDP per capita to capture income effects; government size, measured as the ratio of government expenditure to GDP, to control for the stabilising role of fiscal policy; country size, measured as the logarithm of total population, and the dependency ratio to capture key social characteristics that affect policy volatility; openness, calculated as the merchandise trade-to-GDP ratio, to control for the degree of exposure of economies to external shocks; inflation to control for the occurrence of high inflation episodes; and three dummies, one for the run-up to EMU, another for countries constrained by the SGP, and the last one for new members of the EU, the Central and Eastern European Countries (CEEC).

2.3. Measuring the quality of institutions: the FRI and the Delegation index

In this article, the main focus is on the proxies for the quality of institutions, the FRI and the Delegation index. We are led to believe that countries with better and more developed institutions, with more check and balances, face more difficulties to change fiscal policy for reasons not related to the current state of the economy.

The FRI, which is taken from Debrun *et al*. (2008), is restricted to fiscal rules that fix targets or ceilings to budgetary aggregates expressed in numerical terms. The final objective is to cover all numerical fiscal rules in force that somehow restrain the conduct of fiscal policy, and to measure their relative strength (degree of effectiveness). This index, in contrast to most papers in this area of research, such as Alesina and Bayoumi (1996), Fatás and Mihov (2003, 2006), Furceri and Poplawski (2008), and Afonso *et al*. (2010), may vary over time and not only across countries.[5] Debrun *et al*. (2008), and Afonso and Hauptmeier (2009), have found statistically significant positive effects of this index on budget outcomes. In this context, we expect that the FRI may also work as a means to diminish discretionary fiscal policy volatility.

As for the Delegation index, it focuses on implicit constraints underlying the three phases of the budget process: (i) the $Preparation\ stage$, in which the budget draft is elaborated; (ii) the $Approval\ stage$, in which the budget draft is reviewed, approved and then formalised; and (iii) the $Implementation\ stage$, where the budget is implemented and which may be subjected to modifications or amendments. Hallerberg *et al*. (2007) built an indicator of fiscal governance based on these stages, finding strong evidence for a direct relationship between the institutional setup and fiscal discipline. The construction of our index of Delegation relies on the works of the previous paper and on Fabrizio and Mody (2008). The list of items and institutional scores that make up the index can be found in Table 7 of the appendix. As we consider that individual institutional features are perfect substitutes, we add up all items assuming equal weights to the aggregation process:

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4 It is given by the sum of the squared seat shares of all parties in the parliament:

$$Herfindahl\ index = \sum_{i=1}^{N} \left(\frac{No.\ of\ seats\ of\ party_{i}}{Total\ seats} \right)^{2}, \quad 0 \leq Herf.index \leq 1 \quad (3)$$

5 See Appendix 1 in Debrun *et al.* (2008) for more details.

$$Preparation\,index = \frac{1}{3}\sum_{i=1}^{3} x_i \qquad \chi_i = \text{items 1 to 3 of Table 7} \tag{4}$$

$$Approval\,index = \frac{1}{3}\sum_{i=1}^{3} x_i \qquad \chi_i = \text{items 4 to 6 of Table 7} \tag{5}$$

$$Implementation\,index = \frac{1}{4}\sum_{i=1}^{4} x_i \qquad \chi_i = \text{items 7 to 10 of Table 7} \tag{6}$$

Taking the simple average of the sum of each institutional phase, we obtain:

$$Delegation\,index = \frac{Prepar.\ index + Approv.\ index + Implem.\ index}{3} \tag{7}$$

Table 1 summarises the data on the quality of institutions for each country and decade, after being normalised to zero mean and standard deviation equal to one. Two analyses emerge. First, a country with high numerical fiscal rules does not necessarily have tighter controls over the budget process (i.e. higher Delegation index). In fact, although the simple correlation between the FRI and the Delegation index is positive, it is not statistically significant at 5 per cent. For example, Denmark and Finland in the 2000s have low levels of the Delegation index but high values of the FRI, while Ireland and Greece are good examples of the opposite case. Second, over the last decade, there has been a broad-based increase in the quality of institutions.

Table 1

EVOLUTION OF THE QUALITY OF INSTITUTIONS BY COUNTRY AND DECADE

	1980s	1990s		2000s		Δ(2000s -1990s)	
	Delegation index	FRI	Delegation index	FRI	Delegation index	FRI	Delegation index
Austria	-1.0	-0.8	-0.3	0.4	0.6	1.2	0.9
Belgium	-1.4	0.8	-0.5	0.6	0.3	-0.2	0.8
Czech Republic	-	-	-	0.1	0.2	-	-
Denmark	0.6	0.7	0.1	2.0	-0.1	1.2	-0.2
Estonia	-	0.9	0.8	1.6	1.2	0.8	0.4
Finland	-0.5	-0.1	-0.4	1.5	-0.1	1.6	0.3
France	2.2	-0.3	2.2	0.2	1.6	0.6	-0.6
Germany	0.2	1.1	0.2	1.1	0.2	0.0	0.0
Greece	-1.4	-0.9	-1.0	-0.9	1.0	0.0	2.0
Hungary	-	-0.7	-1.8	-0.5	-1.8	0.2	0.0
Ireland	-0.5	-0.9	-0.5	-0.7	1.1	0.2	1.7
Italy	-2.2	-0.9	-1.0	-0.1	0.3	0.8	1.3
Latvia	-	-0.4	0.5	-0.4	0.5	0.0	0.0
Lithuania	-	-0.2	0.1	0.3	-0.1	0.5	-0.2
Luxembourg	0.4	-0.3	1.0	1.6	1.6	1.9	0.7
Netherlands	-0.5	0.7	-0.3	1.7	-0.1	1.0	0.3
Poland	-	-0.2	-0.4	1.3	0.5	1.5	0.9
Portugal	-0.4	-0.9	-0.5	-0.6	-0.8	0.2	-0.3
Slovakia	-	-0.9	-1.7	-0.1	-1.7	0.7	0.0
Slovenia	-	-	-	0.5	-0.3	-	-
Spain	-2.0	-0.1	-0.5	0.9	-0.1	1.0	0.5
Sweden	-0.5	-0.4	-0.3	1.6	1.2	2.1	1.5
United Kingdom	0.8	0.1	1.3	2.3	1.9	2.2	0.6
Correlation		0.381		0.359			

Source: Hallerberg *et al.* (2007), Debrun *et al.* (2008), Fabrizio and Mody (2008), and author's calculations.

3. Baseline results

3.1. Does the quality of institutions matter to reduce fiscal policy volatility?

In this section, we try to answer the above question by estimating Equation (2), considering primary expenditure as the public spending measure in Equation (1). In Table 2 we focus on the factors that influence policy volatility, giving special attention to our index of Delegation and to the FRI. In column (1), a one-standard deviation increase in the Delegation index and in the FRI would decrease policy volatility by about 8.9 and 10.0 per cent, respectively.[6] This result suggests that the quality of institutions, i.e. more checks and balances faced by politicians, prevent them from using fiscal policy for reasons not related to the current state of the economy.

In column (2), we assess the role played by the political variables. Our results imply that countries with proportional systems have more volatility of discretionary fiscal policy compared to majoritarian systems. The concentration of parliamentary seats in a few parties (the Herfindahl index) would also induce an increase in policy volatility, though it is not statistically significant. Regarding the variable elections, an extensive strand of literature has tested whether governments nearing an election choose to loosen fiscal discipline, engaging in excessive spending or/and cuts in taxes to ensure future re-election, therefore creating more policy volatility. For instance, Hallerberg *et al*. (2007), and Afonso and Hauptmeier (2009) claim that there is evidence of a political budget cycle. In contrast with the previous views, we find a negative sign of elections on policy volatility, which corroborates the findings of Fatás and Mihov (2003) that elections hold politicians accountable. Nonetheless, this result should be interpreted with due care as it is not statistically different from zero at conventional levels. In turn, in column (3) we add one variable that captures political instability, with its coefficient suggesting that higher political instability does not lead to higher public spending volatility.

Including the macroeconomic and other control variables (column (4)) strongly increases the fit of regression (R-squared of 0.439) suggesting that these variables account for a large portion of the variability in policy volatility, while the Delegation index and the FRI are still highly robust to these different specifications. GDP per capita has a negative coefficient, as expected, since according to Fatás and Mihov (2003), it is likely that poorer countries have a more volatile business cycle due to less developed financial markets, and at the same time, may resort more often to discretionary fiscal policy. As regards government size, policy volatility drops as the ratio of primary expenditure increases. This confirms the results of Afonso *et al.* (2010), who demonstrate that bigger governments have more stable government spending and automatic stabilisers are larger, inducing lower volatility of discretionary spending.

Another variable that has been popular in explaining the volatility of fiscal policy is country size (population of a given country). Smaller countries tend to use more discretion in fiscal policy, as documented by Furceri and Poplawski (2008). They argue that the negative relationship between the size of nations and government spending volatility can be explained by two reasons: first, smaller countries, which are more exposed to idiosyncratic shocks and have more output volatility, use fiscal policy more aggressively; second, larger countries have more scope to spread the government spending financing over a larger pool of taxpayers (increasing returns to scale), allowing governments to provide public goods in a less volatile way. The findings on country size are corroborated by our results (and also by Afonso *et al*. (2010)).

Regarding the last three dummy variables, estimates suggest that all of them are associated with lower levels of policy volatility. The interpretation over the sign of the run-up to EMU and the SGP dummy is

6 This is the usual interpretation of the coefficients since both indexes were normalised to have zero mean and standard deviation equal to one. The coefficients' quantitative impact on policy volatility is more accurate if we take the exponential of each coefficient. For instance, the semi-elasticity of policy volatility with respect to the FRI is 10.0 per cent (exp(-0.105)-1).

consensual as those stages have required significant improvements in public finances, lowering therefore policy volatility. In contrast, the explanation for the new members (CEEC) dummy lies on the fact that data for most of the new members are only available for the last decade (Chart 1), conditioning the analysis to only one observation per country. This period of time was indeed marked by major improvements in public finances in order to meet requirements for joining the EU, which led the CEEC to post low values of discretion.

Adding all the variables together allows us to corroborate the previous findings concerning the indexes for the quality of institutions, which point towards a sizeable negative impact on policy volatility; the marginal impact of the FRI and of the Delegation index on public spending volatility is around -11.3 and -16.2 per cent, respectively (column (5)). Taking the two indexes together, there is a strong indication that countries which stand at a one-standard deviation above the average in both indexes have on average 27.5 per cent less volatility in the discretionary component of fiscal policy. It is a striking result: better and more stringent restrictions imposed on the conduct of fiscal policy help mitigate the negative impact of policy volatility on the economy. For instance, if Portugal improved the quality of its institutions, by increasing both indexes (FRI and Delegation index) by one-standard deviation, and considering that the average value for the last decade reflects its current policy volatility, it would reduce policy volatility from 2.5 to 1.8 (reaching values slightly above Sweden but below those of Spain).

Table 2

DELEGATION AND FISCAL RULE INDEXES AND DISCRETIONARY FISCAL POLICY |
DEPENDENT VARIABLE: VOLATILITY OF DISCRETIONARY FISCAL POLICY

	(1)	(2)	(3)	(4)	(5)
Fiscal rule index	-0.105***	-0.072***	-0.116***	-0.152***	-0.120***
	(0.025)	(0.023)	(0.022)	(0.021)	(0.009)
Delegation index	-0.093*	-0.046*	-0.098*	-0.195***	-0.117***
	(0.051)	(0.026)	(0.055)	(0.025)	(0.057)
Electoral system		0.513***			0.180
		(0.139)			(0.246)
Elections		-1.738			-1.342
		(1.129)			(1.354)
Herfindahl index		1.077			0.738***
		(0.679)			(0.173)
Elec. competitiveness		-0.002			0.033
		(0.033)			(0.040)
Government crises			-0.242*		-0.153
			(0.138)		(0.214)
GDP per capita				-0.064	-0.210
				(0.256)	(0.307)
Government size				-0.032***	-0.025***
				(0.009)	(0.008)
Country size				-0.138***	-0.130***
				(0.035)	(0.011)
Dependency ratio				-0.004	-0.011
				(0.008)	(0.008)
Openness				0.000	0.001
				(0.002)	(0.002)
Inflation				-0.001	0.004
				(0.026)	(0.023)
Run-up to EMU				-1.507***	-1.544***
				(0.113)	(0.125)
SGP dummy				-0.470***	-0.486***
				(0.131)	(0.110)
New members				-1.083***	-1.177***
				(0.154)	(0.210)
Number of observations	41	41	41	41	41
Number of countries	23	23	23	23	23
R-squared	0.084	0.165	0.098	0.439	0.462

Source: Author's calculations.

Notes: OLS estimates with panel-corrected standard errors taking 10-year averages. Standard errors are shown in parentheses. Asterisks, *, **, ***, denote, respectively, statistical significance at the 10, 5 and 1% levels. Constant terms are not reported. Policy volatility was obtained from the logarithm of the standard deviation of residuals of Equation (1), with the growth of real primary expenditure as dependent variable.

Looking at other variables, the macroeconomic controls that were significant in column (4) continue to be of crucial importance. For instance, a one-percentage point increase in government size would lower policy volatility by 2.5 per cent, all else being equal. The R-squared of 0.462, from 0.439 in the previous specification, suggests that the political variables and the proxy for political instability may not be so important to explain differences in levels of policy volatility between countries. Indeed, with the exception of the Herfindahl index, which becomes statistically significant - pointing to an increase in policy volatility of nearly 7.7 per cent for each additional tenth of a point index - none of these variables are significant. In particular, our results do not provide evidence for higher values of fiscal policy volatility in the presence of a greater number of elections. In Albuquerque (2011) we find that this *puzzle* of the insignificance of elections on policy outcomes is related to the fact that we are using periods of 10-year averages.

In Albuquerque (2011) we also run additional regressions to deal with some econometric issues, particularly those related with collinearity problems and reverse causality issues. Succinctly, when running regressions with the FRI and the Delegation index in the same equation collinearity problems could emerge in case they are highly correlated. In addition, the problem of reverse causality relates to the possibility that budget outcomes might influence the evolution of fiscal institutions, rather than the other way around. What we have done to deal with these potential problems was to run regressions where the Delegation index and the FRI were used separately as dependent variables - addressing collinearity problems - and to run regressions through the IV estimator by resorting to a set of variables as instruments for the quality of institutions - targeting reverse causality. All in all, we find that the results obtained are consistent with those of Table 2 (see Tables 5 and 6 of the appendix).

3.2. Using the sub-categories of the FRI and Delegation index

Another pertinent analysis would be to confirm if the previous results remain valid and robust when we proceed to disaggregate the indexes for the quality of institutions into sub-categories. The Delegation index is subdivided into the Preparation, Implementation and Approval stages; and the FRI is split into two indexes, one that captures all the expenditure rules in force in the EU member states, the expenditure rule index (ERI), and the other that deals with budget balance and debt rules (BBDRI).

Beginning with the Delegation index sub-components, the most interesting finding relates to the fact that, among all the stages through which the budget draft is prepared, approved and implemented, only the Approval index seems to consistently have explanatory power for reducing policy volatility (Table 3).[7] When we include all the relevant control variables (column (5)), a one-standard deviation increase in the Approval index points to a negative impact of around 13.7 per cent on the volatility of fiscal policy.

Against this background, policy-makers should arguably aim for a strong Approval index. That is, firstly, the executive should be vested with strong agenda-setting powers in order to be protected against significant parliamentary amendments to the initial proposal of the budget, which would create excessive volatility in the conduct of fiscal policy. Secondly, the possibility that parliament is dissolved if it fails to approve the budget in due time would increase the political costs associated to such a fall of government, which would lead to more consensus on the initial budget proposal. And finally, the sequence of votes also matters to reduce policy volatility, i.e. the order of decision-making during the parliamentary budget deliberation should be focused first on defining the limits over total revenue, expenditure and deficit before the work on the details of the budget starts.

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7 Nonetheless, this does not mean that the preparation and implementation stages should be left out from the design of an optimal institutional framework for fiscal policy. In fact, the three variables could be highly correlated with each other, and the Approval index may be capturing the effects of the other two indexes on policy volatility, which ultimately would produce misleading results. We have tested if there was any statistical significant correlation between each one of these three variables, and the results, however, only pointed to a significant correlation between the Preparation index and Approval index of about 0.5.

Moving to the sub-categories of the FRI, our overall assessment is that considering the index of numerical fiscal rules as a whole or taking each sub-component individually leads to qualitatively equal results. Column (5) tells us that a one-standard deviation increase in the ERI and in the BBDRI, other things being equal, would reduce policy volatility by about 9.2 and 12.5 per cent, respectively.

Table 3

SUB-INDEXES AND DISCRETIONARY FISCAL POLICY | DEPENDENT VARIABLE: VOLATILITY OF DISCRETIONARY FISCAL POLICY

	(1)	(2)	(3)	(4)	(5)
Expenditure rule index	-0.011	0.013	-0.021	-0.088**	-0.097***
	(0.036)	(0.048)	(0.028)	(0.043)	(0.037)
B.B. and debt rules index	-0.081***	-0.058	-0.092***	-0.139***	-0.133***
	(0.025)	(0.065)	(0.027)	(0.043)	(0.084)
Preparation index	-0.104	-0.092	-0.098	-0.162	-0.172
	(0.120)	(0.169)	(0.117)	(0.113)	(0.174)
Approval index	-0.128***	-0.129***	-0.136***	-0.144***	-0.147***
	(0.020)	(0.019)	(0.025)	(0.051)	(0.044)
Implementation index	0.083**	0.076***	0.081	0.078	0.088
	(0.039)	(0.028)	(0.050)	(0.059)	(0.059)
Herfindahl index		1.141*			0.323
		(0.664)			(0.492)
Government size				-0.023***	-0.018
				(0.009)	(0.013)
Country size				-0.051	-0.034
				(0.058)	(0.023)
Run-up to EMU				-1.911***	-2.015***
				(0.292)	(0.346)
SGP dummy				-0.559***	-0.593***
				(0.165)	(0.138)
New members				-1.430***	-1.579***
				(0.278)	(0.462)
Number of observations	41	41	41	41	41
Number of countries	23	23	23	23	23
R-squared	0.168	0.229	0.184	0.490	0.520

Source: Author's calculations.

Notes: OLS estimates with panel-corrected standard errors taking 10-year averages. Standard errors are shown in parentheses. Asterisks, *, **, ***, denote, respectively, statistical significance at the 10, 5 and 1% levels. Constant terms are not reported, and other explanatory variables, which are included in Table 2, are also not reported due to space limitation. Policy volatility was obtained from the logarithm of the standard deviation of residuals of Equation (1), with the growth of real primary expenditure as dependent variable.

4. Robustness results

In this section, we conduct some robustness analysis to check if the remarks inferred from our baseline estimates could be extended in two ways: (i) using a different measure of public spending in Equation (1); and (ii) using another specification for the fiscal reaction function to derive our measure of discretionary fiscal policy volatility.

Firstly, we replace real primary expenditure by real consumption expenditure in Equation (1) as the proxy for public spending. We want to test if a narrower measure of fiscal policy, which has been widely used in most of the papers when using a large sample of countries, does still corroborate our findings. Re-estimating different specifications of columns (5) of the previous tables (Table 2 and Table 3), we obtain columns (1) and (2) of Table 4. Overall, the results seem a little disappointing as policy volatility generally appears not to be statistically affected by the quality of institutions (the first seven explanatory variables). In contrast, government size and country size continue to be statistically significant and associated with lower levels of policy volatility. The findings about fiscal institutions not being important for public consumption volatility can be associated with the fact that we are dealing with a less comprehensive measure of fiscal policy, leaving out important items of government expenditure, such as gross fixed capital formation (GFCF), subsidies and social benefits other than transfers in kind, other current transfers and capital transfers, which might not be capturing all discretionary measures undertaken by governments.

In order to prove that it is in fact the exclusion of most of those items from the government spending measure that is influencing our results, we use the largest component of primary expenditure, which is not included in public consumption. This component is social transfers, which account, on average, for around 36 per cent of primary expenditure in our sample of countries for the 2000-2007 period. Using the same methodology as before, we obtain a new measure of policy volatility by applying the growth of real social transfers as the dependent variable in Equation (1). The new estimates confirm our initial suspicion that the volatility of social transfers is highly sensitive to the quality of institutions (columns (3)-(4) of Table 4). In fact, these regressions yield the same qualitative results as those from Table 2 and Table 3. In this context, our baseline results from Section 3, where primary expenditure was used in the first-stage regression, seem to be driven mainly by social transfers.

Secondly, we provide another way of computing the measure of discretionary fiscal policy through a typical fiscal policy reaction function, where government spending reacts to cyclical fluctuations, past developments in public debt, and to its own past values:

$$G_{i,t} = \propto_i + \beta_i Gap_{i,t} + \gamma_i D_{i,t-1} + \delta_i G_{i,t-1} + \omega_{i,t} \quad (8)$$

where the country-specific volatility of the error term (σ_i^{ω}) is again interpreted as the typical size of a discretionary change in fiscal policy for country i. G is the cyclically adjusted primary expenditure (CAPE), Gap is the output gap measured as the difference between actual and potential output, whereas D is gross government debt. All variables are expressed in percentage of potential output, computed according to the production function method. To avoid the possibility of endogeneity bias, we instrument for the output gap using two lags of the own output gap, lagged inflation and the logarithm of oil spot price.

Similarly to what was done before, we take the logarithm of the standard deviation of the residuals as our measure of the volatility of discretionary fiscal policy. Overall, the results of columns (5) and (6) of Table 4 confirm that fiscal institutions play a key role in reducing fiscal policy volatility. But, while fiscal rules variables exhibit a strong, statistically significant negative impact on policy volatility, the results for fiscal governance variables are weaker as only the Preparation stage has the expected negative sign.

Summing up, we have shown that our baseline conclusions are less clear-cut when we use public consumption, instead of primary expenditure, as the proxy for public spending. What we argue, however, is that it is primary expenditure, the most comprehensive measure, that should be used when measuring all discretionary policy measures carried out by governments. Using this broader measure, which includes, *inter alia*, social transfers, one would find that fiscal institutions do matter to reduce fiscal policy volatility in Europe.

Table 4

ROBUSTNESS RESULTS | DEPENDENT VARIABLE: VOLATILITY OF DISCRETIONARY FISCAL POLICY

	Consumption expenditure		Social transfers		CAPE	
	(1)	(2)	(3)	(4)	(5)	(6)
Fiscal rule index	-0.157		-0.057**		-0.175***	
	(0.205)		(0.027)		(0.061)	
Expenditure rules index		0.104		0.172*		-0.110***
		(0.114)		(0.102)		(0.004)
B.B. and debt rules index		-0.240*		-0.546***		-0.086***
		(0.135)		(0.046)		(0.022)
Delegation index	-0.107		-0.180***		0.063	
	(0.202)		(0.042)		(0.079)	
Preparation index		-0.018		-0.343**		-0.326**
		(0.260)		(0.142)		(0.158)
Approval index		-0.094		-0.079		0.081**
		(0.084)		(0.117)		(0.032)
Implementation index		0.010		0.379***		0.367***
		(0.123)		(0.078)		(0.068)
Herfindahl index	-0.516	-0.656	-2.755***	-3.120***	-0.078	0.232
	(1.852)	(2.034)	(1.029)	(0.710)	(0.142)	(0.172)
Government size	-0.039***	-0.046**	-0.044***	-0.048***	0.005	0.032***
	(0.013)	(0.022)	(0.003)	(0.019)	(0.023)	(0.009)
Country size	-0.190**	-0.181*	-0.293***	-0.050	-0.035**	0.076***
	(0.075)	(0.105)	(0.037)	(0.065)	(0.017)	(0.022)
Run-up to EMU	0.401	0.419	-0.996**	-1.389***	-0.996***	-1.926***
	(0.492)	(0.350)	(0.389)	(0.264)	(0.365)	(0.180)
SGP dummy	0.288***	0.275**	-0.200	-0.585***	-0.100	-0.178**
	(0.111)	(0.119)	(0.171)	(0.108)	(0.166)	(0.078)
New members	0.380	0.446	-1.601*	-2.049***	-0.377	-1.394***
	(1.382)	(1.273)	(0.854)	(0.528)	(0.423)	(0.166)
Number of observations	44	44	42	42	38	38
Number of countries	23	23	23	23	23	23
R-squared	0.716	0.738	0.691	0.789	0.340	0.611

Source: Author's calculations.

Notes: OLS estimates with panel-corrected standard errors taking 10-year averages. Standard errors are shown in parentheses. Asterisks, *, **, ***, denote, respectively, statistical significance at the 10, 5 and 1% levels. Constant terms are not reported, and some explanatory variables are also not reported due to space limitation. Policy volatility was obtained from the logarithm of the standard deviation of residuals of Equation (1) for columns (1)-(4), and from Equation (8) for columns (5)-(6). The dependent variables used in the first-stage regressions were as follows. Columns (1)-(2): the growth of real consumption expenditure; Columns (3)-(4): the growth of real social transfers; Columns (5)-(6): the ratio of CAPE to potential GDP.

5. Concluding remarks

This work provides evidence for a sizeable, statistically significant negative impact of the quality of institutions on public spending volatility in the EU countries. It is probably the case that countries with more checks and balances make it more difficult for governments to change fiscal policy for reasons unrelated to the current state of the economy. This finding reinforces the need for a well-defined and appropriate institutional design of fiscal rules and of budgetary procedures.

Our results also confirm the findings of Furceri and Poplawski (2008), who state that bigger countries have in general less government spending volatility, as they resort less to government spending for fine-tuning purposes and as governments from big countries could provide public goods in a less volatile way. Our estimates provide further evidence about the stabilising function that bigger governments exert, since countries with large public sectors as a percentage of GDP have more stable government spending and automatic stabilisers are larger, inducing lower volatility of discretionary spending.

What appears to be a surprise, and in fact contrasts with results elsewhere, relates to the insignificance of most of the political factors. In fact, with the exception of the Herfindahl index which suggests that high concentration of parliamentary seats in a few parties would increase public spending volatility, none of the political variables turn out to be statistically significant. These findings may be related to the fact that we are dealing with the EU countries that have more political similarities than one would initially suspect. In general, the run-up to EMU and the SGP dummies have the expected sign, pointing to lower levels of policy volatility. In addition, the results for most of the new EU members also point to reduced levels of policy volatility, reflecting recent improvements in public finances in order to meet the requirements for joining the EU.

Our analysis is nevertheless somewhat conditioned by the fact that the results are sensitive to the choice on the measure used for public spending. If we chose public consumption, a narrower measure of public expenditure, instead of primary expenditure (used in the baseline), none of the variables measuring the quality of institutions would be significant. This is an interesting result, shedding some light on the possible caveats of previous studies (Fatás and Mihov (2003), and Afonso *et al*. (2010)), where public consumption has been used as the measure of public spending. In fact, our results imply that a more comprehensive measure of fiscal policy is able to better capture all discretionary measures undertaken by governments. More specifically, our estimates suggest that social transfers, one important item of primary expenditure that is not included in public consumption, is in fact driving the results. We believe that by using a broader measure for public spending, we have constructed a better measure of $discretion$, which we defined as government policy actions that do not represent reactions to changes in economic conditions and that may only reflect political preferences.

All in all, by studying the effects of explicit and implicit budgetary constraints on fiscal policy volatility, we contribute to the debate on improving and reaching an optimal institutional framework for fiscal policy. Although our results point to the strengthening of fiscal institutions, each case must be considered individually, taking into account the prevailing institutional and economic environment, and evaluating the advantages and disadvantages of the application of given constraints. In fact, there are some countries that are more exposed and vulnerable to external shocks and therefore it would be preferable to have more flexibility to respond to these shocks, minimising in that way the economic costs of restrictions and deliberately letting the volatility increase.

The current analysis offers several possibilities for further research. One could explore other data sets with respect to the proxy for the quality of institutions, for example concerning independent fiscal committees. One could also test, following Fatás and Mihov (2006), if the benefits stemming from the imposition of restrictions would outweigh the negative effects from the loss of flexibility to respond to output shocks. Another possible extension, in line with Fabrizio and Mody (2008), would be to identify what determines the existing institutional environment in EU countries.

Appendix

Table 5

DELEGATION INDEX AND DISCRETIONARY FISCAL POLICY |
DEPENDENT VARIABLE: VOLATILITY OF DISCRETIONARY FISCAL POLICY

	(1)	(2)	(3)	(4)	(5)	(6) IV
Delegation index	-0.132**	-0.033***	-0.157**	-0.202***	-0.199***	-0.388*
	(0.054)	(0.010)	(0.067)	(0.044)	(0.059)	(0.231)
Herfindahl index		2.066**			1.723**	0.995
		(0.967)			(0.867)	(1.397)
Government size				-0.034***	-0.028***	-0.031*
				(0.006)	(0.007)	(0.019)
Country size				-0.138***	-0.124***	-0.188**
				(0.046)	(0.025)	(0.080)
Number of observations	56	56	56	56	56	41
Number of countries	23	23	23	23	23	23
R-squared	0.063	0.181	0.078	0.372	0.418	0.415
OID test (p-value)						0.402

Table 6

FISCAL RULE INDEX AND DISCRETIONARY FISCAL POLICY |
DEPENDENT VARIABLE: VOLATILITY OF DISCRETIONARY FISCAL POLICY

	(1)	(2)	(3)	(4)	(5)	(6) IV
Fiscal rule index	-0.142***	-0.089***	-0.155***	-0.214***	-0.172***	-0.343*
	(0.031)	(0.023)	(0.035)	(0.022)	(0.032)	(0.185)
Herfindahl index		1.055			0.905***	-0.457
		(0.717)			(0.183)	(1.895)
Government size				-0.022***	-0.017**	-0.026*
				(0.008)	(0.007)	(0.017)
Country size				-0.138***	-0.095***	-0.042
				(0.026)	(0.023)	(0.097)
Number of observations	41	41	41	41	41	41
Number of countries	23	23	23	23	23	23
R-squared	0.060	0.161	0.072	0.383	0.431	0.400
OID test (p-value)						0.535

Source: Author's calculations.

Notes: OLS estimates with panel-corrected standard errors taking 10-year averages. Standard errors are shown in parentheses. Asterisks, *, **, ***, denote, respectively, statistical significance at the 10, 5 and 1% levels. Due to space limitation, only some variables are reported. The dependent variable is the same as in Table 2. In column 6 of Table 5, the Delegation index is instrumented by: a dummy for countries with delegation in the execution of their budget, a variable counting the number of times of cabinet changes, and six Worldwide Governance Indicators, namely voice and accountability, political stability and absence of violence, government effectiveness, regulatory quality, rule of law, and control of corruption (see Kaufmann *et al.* (2009) for more details). In column 6 of Table 6, the instruments for the Fiscal rule index are the same, with the exception of a dummy for countries that rule their budget process mainly by commitment over fiscal contracts, which replaces the delegation dummy. The overidentifying restrictions test (OID) or Sargan test reports p-value from a test that the instruments are uncorrelated with the residuals.

Table 7

CODING SCHEME FOR EACH PHASE OF THE BUDGET PROCESS	
Preparation Stage	**Numerical Coding**
1. General constraint	
Spending and debt as share of GDP	4
Spending as share of GDP or golden rule or limit on public borrowing	3
Balance and debt as share of GDP	2
Balance as share of GDP	1
None	0
2. Agenda setting	
MF or PM determines budget parameters to be observed by spending ministers	4
MF proposes budget norms to be voted on by cabinet	3
Cabinet decides on budget norms first	2
MF or cabinet collects bids subject to the pre-agreed guidelines	1
MF or cabinet collects bids from spending ministers	0
3. Structure of negotiations	
Finance ministry holds bilateral negotiations with each spending ministry	4
Finance ministry holds multilateral negotiations	2
All cabinet members involved together	0
Approval Stage	
4. Parliamentary amendments of the budget	
Are not allowed, or required to be offsetting	4
Do not required to be offsetting	0
5. Relative power of the executive vis-à-vis the parliament; can cause fall of government?	
Yes	4
No	0
6. Sequence of votes	
Initial vote on total budget size or aggregates	4
Final vote on budget size or aggregates	0
Implementation Stage	
7. Procedure to react to a deterioration of the budget deficit due to unforeseen revenue shortfalls or expenditure increase	
MF can block expenditures	4
MF cannot block expenditures	2
8. Transfers of expenditures between chapters (i.e. ministries' budgets)	
Not allowed	4
Only possible within departments with MF consent	3.2
Only possible within departments	2.56
Require approval of parliament	1.92
Only if provided for in initial budget or with MF approval	1.28
Limited	0.64
Unlimited	0
9. Changes in the budget law during execution	
Only new budgetary law to be passed under the same regulations as the ordinary budget	4
Requires parliament consent	2
At total or large discretion of government	0
10. Carryover of unused funds to next fiscal year	
Not permitted	4
Limited and required authorization by the MF or parliament	2.66
Limited	1.33
Unlimited	0

Source: Hallerberg *et al.* (2007) and Fabrizio and Mody (2008).

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