THE EFFECTS OF GRANTS CUTS ON PUBLIC DEFICIT: DOES INCUMBENT'S IDEOLOGY MATTER?[1]

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Abstract:
Grants cuts may be compensated by increases in own revenues in order to maintain expenditure level. If so, asymmetries in the effects of grants on the latter will be found. Using a dataset from Galician municipalities, the way of financing those asymmetries is analyzed. Debt is the main instrument used by local governments to smooth grants cuts, with taxes playing a marginal role. Departing from this result, relationships between deficit and ideology are studied. While increases in deficit due to grants cut are only statistically significant in the case of leftist incumbents, there are other causal mechanisms relating ideology and propensity to deficit. Differences between leftist and non-leftist incumbents are also relevant when looking at the effects of the electoral cycle, the use given to grants, or the propensity to tax households' income. As those differences play in opposite directions, net result is that relationship between ideology and deficit size is not statistically significant at usual levels. Those results claim for a careful analysis of the role played by politics in fiscal choices. In particular, the use of interactions between political variables and usual regressors in fiscal equations should be exploited in a higher extent to understand the net effect of the former on the latter.

Key words: Local governments, Grants, deficits, Fiscal federalism, Spain

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I. MOTIVATION

Reductions in public expenditure motivated by grants cuts may be offset by granted governments increasing own resources. This compensation is shown in a number of papers (Stine, 1994; Volden, 1999; Gamkhar, 2000; Heyndels, 2001; Lago-Peñas, 2004). Such behavior involves asymmetries in the effects of grants: in absolute values, the marginal effect of rises in grants on expenditure is stronger than the marginal effect of cuts. Several reasons may explain it. Gramlich (1987) points out that cutting established spending programs boosted in the past by higher grants might be too costly from an electoral standpoint. By the same token, Stine (1994) and Volden (1999) point out the role played by special interest groups and bureaucracy in favoring certain spending programmes. Stine (1994) also posits that the existence of fiscal illusion may explain a larger increase in own-source revenue to offset the loss of aid than would be predicted if response were symmetrical. In Lago-Peñas (2004) two additional explicative factors are found: ideology and financial situation. Municipalities with lower levels of debt and leftist governments are more prone to maintain expenditures in face of grants cuts[2].

Obviously, if expenditures are maintained when grants drop, deficit or taxes must increase. Here we have the first question to be analyzed in this paper: the nature of the financial instrument chosen. The same data panel for Galician local governments than in Lago-Peñas (2004) is used. A significant number of grants cut episodes (see Table 2) and both fiscal and debt autonomy enjoyed by municipalities (Monasterio and Suarez-Pandiello, 2002) make it suitable for the purpose of this paper. I found that deficit is the main instrument to compensate grants cuts, while own non-financial resources play a secondary role. Combining this result with the previous one (that only leftist governments

[2] This last result adds to other kind of asymmetric fiscal responses motivated by ideology. Tavares (2004) demonstrates, for a large sample of OCDE countries, that fiscal adjustments are asymmetric depending on incumbent's ideology. Leftist governments are more prone to increase taxes when reducing deficit, in spite of the fact that they are more credible when cutting expenditures. Castells et al (2004) show that the process of fiscal adjustment done by a wide sample of Spanish municipalities during the nineties was influenced very much by the political situation. In particular, leftist governments tend to react through increases in tax effort to a greater extent than rightist governments. Using data from European countries during the nineties, Mulas (2003) also finds that leftist incumbents are more reluctant to cut public investment and employment, which may involve asymmetries in the effects of cut grants on expenditures, taxes, and deficits.

offset cuts in grants) one could think that ideology will be correlated with deficit size. Is this reasoning right? If not, why? Answering both questions is the second aim of this work.

While there exists a number of empirical works showing that leftist cabinets are more prone to high spending and taxes[3], evidence on the relationship between ideology and the size of actual deficit is not conclusive. Using international data at country level, papers by Boix (2000) and Volkerink and De Haan (2000) back this hypothesis, but Hahm et al, (1995) and Alesina el at (1998) do not. Results by Lowry et al (1998) for American states are especially suggestive. On the one hand, republican gubernatorial candidates lose votes if their party is responsible for unanticipated increases in the size of the state budget; Democrats do not and indeed they may be rewarded for small increases. But on the other, the incumbent governor's party –both republican and democrat- is punished in legislative elections for failing to maintain fiscal balance.

According to econometric estimates presented in section 3, direct relationship between deficit and ideology is not statistically significant at usual levels, in spite of the fact that leftist incumbents increase deficits in a higher extent when grants are cut. In order to explain this seeming paradox, both deficit and own revenues equations are estimated again, organizing observations into two groups: leftist and non-leftist incumbents. Results reveal that the relationship between ideology and deficit involves several causal mechanisms with opposite effects and then a not significant net effect. In this sense, the present paper contributes to the literature on both the asymmetric effects of grants and the political economy of public deficits.

The article is structured into four sections, including this one. In section two, econometric specification and data are presented. Section three discusses econometric results. Section four concludes.

[3] See the survey by Boix (2000).

II. ECONOMETRIC ESPECIFICATIONS AND DATA DESCRIPTION

ECONOMETRIC SPECIFICATIONS

Most of previous studies on the asymmetric effects of grants depart from one of the following functional relationships:

$$T = f(I, G, \{X\}) \qquad [1]$$

$$E = g(I, G, \{Y\}) \qquad [2]$$

In those equations T is taxes, E expenditure, I is private income, G is grants, and $\{X\}$ and $\{Y\}$ are two set of control variables. Both relationships are then translated into the following econometric specifications for panel data:

$$E_{it} = \alpha_{0i} + \alpha_1 I_{it} + \alpha_2 G_{it} + \alpha_3 \left(G_{it} - G_{it-1}\right) D_{it} + \sum_{h=1}^{n} \alpha_{h+3} X_{hit} + \varepsilon_{it} \qquad [3]$$

$$T_{it} = \beta_{0i} + \beta_1 I_{it} + \beta_2 G_{it} + \beta_3 \left(G_{it} - G_{it-1}\right) D_{it} + \sum_{h=1}^{m} \beta_{h+3} Y_{hit} + \mu_{it} \qquad [4]$$

$$with \;\; D_{it} = 1 \;\; if \;\; G_{it} < G_{it-1} \;\; and \;\; D_{it} = 0 \;\; otherwise$$

In some cases lags of explanatory variables are included, or subsets of expenditures or grants are considered. Symmetry in the effects of falls and rises in grants involves $\alpha_3 = 0$ or $\beta_3 = 0$, respectively.

Using the government budget constraint, we can express deficit as:

$$DEF = E - T - G$$

Assuming that G is an exogenous variable, we get the following functional relationship:

$$DEF = h(I, G, \{X\}, \{Y\}) \qquad [5]$$

And then:

$$DEF_{it} = \gamma_{0i} + \gamma_1 I_{it} + \gamma_2 G_{it} + \gamma_3 \left(G_{it} - G_{it-1}\right) D_{it} + \sum_{h=1}^{n} \gamma'_h X_{hit} + \sum_{h=1}^{m} \gamma''_h Y_{hit} + \upsilon_{it} \qquad [6]$$

$$with \;\; D_{it} = 1 \;\; if \;\; G_{it} < G_{it-1} \;\; and \;\; D_{it} = 0 \;\; otherwise$$

DATA DESCRIPTION

Our primary interest in this paper is analyzing the way of financing asymmetry responses. Therefore, empirical analysis departs from equations [4] and [6], using deficit and own revenues as explained variables. In order to test homogeneity of slopes between groups, interactions between right-hand variables and two complementary dummy variables will be also used.

Variable *I* is defined as per capita households' income. *G* is grants received by municipalities, both unconditional block grants and earmarked grants. *OR* are own non-financial revenues. It mostly includes taxes, fees and public prices, but also some other minor concepts in quantitative terms, like fines. As already defined, variable *D* is a dummy adopting value 1 when total grants rise and 0 otherwise. All monetary variables are deflated and expressed in euros per capita. A public consumption deflator for Spain is used. Unfortunately, there is only municipal data on households' income for 1996. Therefore, provincial growth rates of per capita households' income to 1996 municipal data have been applied[4]. Two other explicative variables were included. Incumbent's ideology (*LEFT*): it values 1 for leftist governments and 0 otherwise; the electoral cycle (*CY*): it values 1 in electoral years (1987, 1991, and 1995) and 0 otherwise[5]. Table 3 shows data sources of all variables used in this section.

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[4] Data for municipality *i* in year *t* is calculated according to the formula: $I_{it} = \frac{I_{i1996}}{\prod_{m=t+1}^{1996}(1+g_{pm})}$ where g_{pm} is the nominal growth rate corresponding to province *p* in year *m*. The region of Galicia is divided into four provinces.

[5] When analyzing the existence of asymmetries in the effects of grants on expenditure, electoral support enjoyed by the incumbent was included, but it was scarcely significant from a statistical standpoint (Lago-Peñas, 2004). Population may be also a relevant variable for at least two reasons: economies of scale in the provision of local public services, and differences in the range of powers of municipalities. The array of mandatory services provided by Spanish municipalities increases with population size. Legal thresholds are imposed in 5.000, 20.000 and 50.000 populations. However, variable population was not significant at usual levels (its effect may be captured by individual fixed effects due to its low within-variation) and it was dropped from final results shown in Table 4.

Initial database comprises all 313 Galician municipalities observed from 1985 to 1995. The main justification for using information from just one of the 17 Spanish regions is that available data is not homogeneous between regions. Difficulties in building a broad and reliable database are cumbersome when municipalities from several regions want to be taken into account. Moreover, the lack of data for some municipalities in some years makes the panel unbalanced. Availability of information is also the reason for using data for the period 1985-1995. Due to econometric reasons, municipalities with less than 50% of observations available were excluded. As it will be shown, disturbances are panel heteroskedastic and contemporaneously correlated across panels. Computing the corresponding variance-covariance matrix is problematic when there are many municipalities with few observations. Sample is also reduced due to votes of censure. According to data gathered by Márquez (2004), 48 observations must be dropped due to change of incumbents during the term of office. Therefore, the number of municipalities drops from 313 to 264 (-15.7%) and observations from 2603 to 2343 (-9.0%). Because variations in grants are used, the first observation corresponds to 1986.

The evolution of aggregated data is shown in Table 2. Simple means are used. Figures are expressed in constant euros per capita. Negative deficit means surplus. Correlation matrix for first differences of time means in table 2 is shown in table 3. Only correlations between *G* and *E* (positive) and between *G* and *DEF* (negative) are statistically significant. Strong surplus in 1992 is explained by growth in grants from the central government[6]. Deficit and elections seems to be related. Two highest values for deficits are attained in election years (1987 and 1991). The percentage of observed municipalities suffering a cut in grants is shown in column 5 of Table 2. Percentages are quite high, particularly at the end of the sample. Economic downturn in 1993-1995 (the Spanish economy grew by –1.0% in 1993) would be the main explanation for those wide cuts in grants.

[6] Grants from central government to municipalities are calculated as a percentage of tax collection by the former. Actual tax collection in 1991 was significantly higher than forecasted and differences were granted to municipalities in 1992 (Xunta de Galicia, 1996, p.47).

Table 1: Definition of variables and data sources

NAME	DEFINITION	DATA SOURCE
CY	Electoral cycle (*CY*=1 in election years and *CY*=0 otherwise)	
D	Dummy variable to control cuts in total grants (*D*=1 if grants are cut and *D*=0 otherwise)	Conselleria de Economia e Facenda (www.cixtec.es/conselleria)
DEF	Public Deficit	Conselleria de Economia e Facenda (www.cixtec.es/conselleria)
G	Granted revenues	Conselleria de Economia e Facenda (www.cixtec.es/conselleria)
I	Per capita households' income	Instituto Galego de Estatística (www.ige.xunta.es) and Instituto Nacional de Estadística (www.ine.es)
LEFT	Incumbent's ideology (*LEFT*=1 for leftist incumbents and 0 otherwise)	Ministerio del Interior (www.elecciones.mir.es) and Marquez (2004)
OR	Own non-financial revenues	Conselleria de Economia e Facenda (www.cixtec.es/conselleria)

Table 2: Dynamics of expenditure, deficit, own non-financial revenues, and grants 1986-1995. Simple time means. Euros per capita.

Year	*E*	*DEF*	*OR*	*G*	*CUTS*
1986	74.97	1.95	30.50	42.52	37.3%
1987	77.34	2.70	32.96	41.69	54.5%
1988	89.61	0.68	36.46	52.47	20.9%
1989	101.57	0.56	39.05	61.96	15.2%
1990	111.90	-2.64	44.05	70.49	16.3%
1991	141.30	6.99	50.05	84.26	34.9%
1992	157.58	-10.08	52.59	115.06	20.9%
1993	164.43	2.62	52.55	109.26	60.2%
1994	156.50	3.60	56.42	96.49	65.0%
1995	163.97	2.63	59.06	102.28	51.2%

Table 3: Matrix correlation. First differences of series in table 2

	E	*DEF*	*OR*	*G*
E	1			
DEF	0.02 (0.959)	1		
OR	0.40 (0.286)	-0.07 (0.858)	1	
G	0.74 (0.023)	-0.64 (0.063)	0.23 (0.552)	1

Note: p-values in parenthesis

III. ECONOMETRIC RESULTS

Several specification tests have been applied on econometric specifications [4] and [6]. The Hausman test on the exogeneity of variable *G* and the Breusch-Godfrey test on residual autocorrelation did not reveal problems in both senses. Multicollinearity is not a serious concern: multiple correlations among regressors were moderate. Coefficients of determination for auxiliary regressions of each one of the regressors on the rest were computed. In the case of column 1 in table 4 all of them were below 0.15. In the case of column 2 all were below 0.73, lower than the main R^2. Moreover, according to the results of both a standard F-test and a Wald test, homogeneity of intercepts is not rejected in the case of deficit equations, but it must be rejected when *OR* is used as explained variable. In this second case, individual fixed-effects are included[7].

On the contrary, a LM test applied on the OLS residuals detected cross-section heteroscedasticity[8], and the carrying out of another LM test pointed out the presence of contemporaneous correlation[9]. SUR weighted least squares (sometimes referred to as the Parks estimator) is usual solution when both problems are simultaneously found. However, the Parks correction for contemporaneously correlated errors cannot be used unless the number of time periods (T) is at least as big as the number of cross-sections (N). Moreover, even when T is greater than N there are a number of potential pitfalls with the application with a small number of time periods (Beck and Katz, 1995: Beck, 2001). As a practical solution, those authors suggest a different method to deal with both cross-section heteroscedasticity and cross-section correlation. They suggest retaining OLS estimates but correcting the covariance matrix using the so-called *Panel Corrected Standard Errors* (PCSE):

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[7] Correlation between individual effects and explicative variables was tested using a robust form of the Hausman statistic (Wooldridge, 2002). Results backed the use of fixed-effects instead of random-effects.

[8] $LM = \frac{T}{2}\sum_{i=1}^{n}\left[\frac{\hat{\sigma}_i^2}{\hat{\sigma}^2} - 1\right]^2$ where $\hat{\sigma}_i^2$ and $\hat{\sigma}^2$ are the estimated variances using OLS residuals, *n* is the number of individuals and *T* the number of periods. See Greene (2003).

[9] $\lambda_{LM} = T\sum_{i=2}^{n}\sum_{j=1}^{i-1} r_{ij}^2$ where r_{ij}^2 are squared correlations among OLS residuals. See Breusch and Pagan (1980).

$$Cov(\hat{\beta}) = (X'X)^{-1}(X'\Omega X)(X'X)^{-1}$$

Matrix Ω is an $NT \times NT$ block diagonal with an $N \times N$ matrix of contemporaneous covariances, Σ, along the diagonal. A typical element of Σ can be estimated, using OLS residuals, by:

$$\hat{\Sigma}_{ij} = \frac{\sum_{t=1}^{T} \hat{\varepsilon}_{it}\hat{\varepsilon}_{jt}}{T}$$

In order to test homogeneity of slopes between groups, in column 3 and 4 of Table 4, interactions between regressors included in columns 1 and 2 and variable *LEFT* and its complementary $NOLEFT = 1 - LEFT$ are used. Terms multiplied by the former correspond to municipalities ruled out by leftist incumbents. Conversely, terms multiplied by the latter correspond to non-leftist incumbents. Variables *LEFT* and *NOLEFT* do not entry in levels in the fourth column because of perfect multicollinearity with individual fixed effects.

Columns 1 and 2 of Table 4 show the following results:

- The higher the per capita income, the higher the own non-financial revenues (taxes) and the deficit. Both results taken together mean that the income elasticity of expenditure is slightly higher than the corresponding to non-financial revenues.
- Grants are negatively correlated with deficit. Relationship between grants and own revenues is positive but not very significant (p-value=0.089).
- Deficit tends to be higher in election years. Because the coefficient for *CY* is not significant in column 2, it means that the electoral cycle is only reflected in higher expenditures.
- Deficit is the main instrument used to partially compensate grants cuts. One less euro in grants means an increase in deficit of 17.6+6.2=23.8 cents and a rise in own revenues of 3.4 euros.
- The coefficient of Incumbent's ideology is positive but not significant at 10% (p-value=0.113). Once the effects of the rest of explicative variables are discounted, ideology is not relevant to explain differences in the level of deficit.

Columns 3 and 4 of Table 4 show between-groups differences for leftist and non-leftist incumbents:

- The positive relationship found between income and deficit is only significant in the case of municipalities ruled out by non-leftist governments. For each level of income, leftist governments collect higher own-revenues (taxes).
- Increases in grants involve reduction in deficits only in the case of non-leftist incumbents.
- Expenditure significantly grows in election years in the case of leftist governments. On the contrary this relationship is only marginally significant for non-leftist incumbents (p-value=0.131)
- Asymmetry is much stronger in the case of leftist incumbents. For them, one less euro means an increase in *DEF* of 32.8 cents and an increase in *OR* of 5.8 cents. For non-leftist government and using coefficients significant at 10% or less, both figures are 8.1 cents and 0.0 cents, respectively. In municipalities ruled out by non-leftist incumbents, reactions of expenditure to grants changes are symmetrical.

In sum, while there is a non-significant net effect of ideology on deficit, ideology matters when explaining deficit. This paradox is explained by the fact that there are several mechanisms relating both variables in opposite directions. Leftist incumbents are more activists in several grounds. They increase more their deficit when grants are cut to (partially) maintain expenditure. They increase expenditure and deficit in election years more than non-leftist governments[10]. And they do not use rises in grants to cut deficit as non-leftist incumbents do. However, the latter are more reluctant to use own non-financial revenues in financing expenditure. Insofar as there is a positive relationship between per capita income and local expenditure, the higher the level of income, the higher the deficit in municipalities ruled out by non-leftist governments.

[10] In Lago-Peñas and Lago-Peñas (2004) it is also demonstrated that upward deviations from both revenues and expenditures forecasts are significantly higher in the case of leftist governments, while deviations in deficit are not.

With the aim of showing the effects of wrong specification on results, both *DEF* and *OR* were regressed on *LEFT* as the only explicative variable, including individual fixed effects in the second case. Coefficients were 2.71 and 4.42, and p-values corresponding to robust t-statistics are 0.114 and 0.001, respectively. However, we know that both estimates may be biased due to the omission of relevant variables. If those were not orthogonal to *LEFT*, their effects would be reflected into the coefficient of the latter. This is a well-known problem in econometrics that claims for full econometric specifications. According to table 3, the effect of *LEFT* on *OR* changes dramatically when other regressors are included (coefficient=0.93 and p-value=0.373).

The methodological point to make here is that avoiding the exclusion of relevant variables is not enough to be confident about econometric results. As shown, imposing common intercepts or neglecting interactive mechanisms may be another kind of specification problem that hides important relationship between fiscal and political variables. Hence, preliminary econometric specifications should be as unconstrained as possible

Table 4: OLS estimates

EXPLAINED VARIABLE	*DEF*	*OR*	*DEF*	*OR*
Intercept	1.20 (0.752)			
I	0.001 (0.037)	0.009 (0.000)		
G	-0.062 (0.000)	0.016 (0.089)		
CY	4.76 (0.038)	-0.59 (0.346)		
*ΔG*D*	-0.176 (0.000)	-0.034 (0.048)		
LEFT	2.60 (0.113)	0.93 (0.373)	-3.22 (0.382)	
NOLEFT			-1.09 (0.754)	
*I*LEFT*			0.001 (0.186)	0.010 (0.000)
*I*NOLEFT*			0.001 (0.033)	0.009 (0.000)
*G*LEFT*			-0.035 (0.252)	0.018 (0.219)
*G*NOLEFT*			-0.081 (0.002)	0.010 (0.342)
*CY*LEFT*			6.16 (0.016)	-1.08 (0.574)
*CY*NOLEFT*			4.25 (0.131)	-0.52 (0.428)
*ΔG*D*LEFT*			-0.328 (0.000)	-0.058 (0.072)
*ΔG*D*NOLEFT*			-0.071 (0.101)	-0.014 (0.482)
R^2	0.045	0.855	0.060	0.856
Sample size	2343	2343	2343	2343

Notes: Below coefficients appear p-values corresponding to robust t-statistics calculated using Panel Corrected Standard Errors (PCSE). R^2 is the coefficient of determination. Estimates for *OR* include individual fixed-effects.

IV. CONCLUSIONS

In Lago-Peñas (2004) it is demonstrated that reactions to ups and downs in grants by a wide sample of Galician municipalities are not symmetric. While marginal propensity to spend when grants are rising is 0.9, marginal propensity to cut expenditures when grants are falling is 0.7. Moreover, ideology is enough to explain asymmetry. Only leftist incumbents react asymmetrically.

This paper has analyzed two extensions of those results by using the same dataset. Firstly, attention is focused on the way of financing asymmetries in the effects of grants on expenditure. Debt is the main instrument used by local governments, with taxes playing a marginal role. Secondly, relationships between asymmetry, deficit, and ideology are studied. The main conclusion in this respect is that differences between leftist and non-leftist incumbents in terms of reactions to grants cuts is just one of the causal mechanisms relating ideology and propensity to deficit.

Differences between leftist and non-leftist incumbents are also relevant when looking at the effects of the electoral cycle, the use given to grants, or the relationship between households' income and own non-financial revenues. The positive effect of electoral cycle on expenditure and deficit is stronger in the case of leftist incumbents. While grants are partially used to cut deficit by non-leftist governments, their own non-financial revenues (taxes) are lower, what boosts deficits. As those mechanisms play in opposite directions, net result is that the effect of ideology on deficit size is not statistically significant at usual levels. The contrast between highly significant individual mechanisms and a non-significant net aggregated effect claims for a careful analysis of the role played by politics in fiscal choices and, in particular, of the several mechanisms relating ideology and public deficit.

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