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Testing Models of Distributive Politics in Multiparty Systems: The Case of Spain

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Contents

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Abstract

This paper extends empirical literature on political economy of intergovernmental transfers to multiparty systems that are typical for most European countries. It proposes and uses new methods of estimating the number of swing voters from survey data. The first method estimates densities at the cutpoints, where a voter is equidistant to competing parties. To take into account bi-dimensionality of Spanish politics for three party regions, we estimate bivariate densities at the cutpoints on the left-right and nationalist dimensions. The second method counts voters with similar predicted likelihoods of voting for parties in the regions. The likelihoods of voting are estimated with the multinomial probit technique and include additional controls for the nationalist sentiment. We find that political variables enter significantly into allocation of state subventions in Spain, and the magnitude of the effect is comparable to that of economic variables. In particular, we find strong evidence for the *loyal hypothesis* and no evidence for the *swing hypothesis*. In line with the explanation suggested by Cox and McCubbins (1986), the risk-averse incumbent prefers investing in loyal regions, where he knows better preferences and numbers of their supporters.

1. Introduction

It has been widely acknowledged that when allocating public monies, equity and efficiency are not the only considerations and political factors often play an important role. Existing theoretical models developed a framework for incorporating political motives into decisions of policy makers (Dixit and Londregan, 1996 and 1998; Linbeck and Weibull, 1987; Cox and McCubbins, 1986; Snyder, 1989). In testing predictions of these models most of the empirical papers has focused on political competition in bipartisan (and often winner-takes-all) systems (see, e.g., Wright, 1974; Case, 2001; Johansson, 2003; Dahlberg and Johansson, 2002; Stromberg, 2001). However, some standard proxies for testing theories of distributive politics are inappropriate if applied to multiparty systems that are typical for most European countries.

In particular, closeness of election in a region is not a good proxy for a swing state where more than two parties compete. As Snyder (1990) puts it, with two parties "closeness" is a relatively well defined notion, namely, a race in district A closer than in district B if the probability of either party winning is closer to ½ in district A. However, with three of more relevant parties, closeness is a slippery multidimensional creature (Snyder, 1990). It is not clear, which race is closer, the one with probabilities of winning ½, 3/8 and 1/8 or the one with 1/2, ¼ and ¼?

Moreover, in contrast to two-party (often winner-takes all) systems, in proportional systems electoral rules might change relative political productivity of regions. The electoral formula that translates votes into seats might result in the fact that in small electoral districts fewer voters may elect a deputy than in big districts.

Two recent papers study the effects of electoral variables within the framework of a Spanish multiparty system (Castells and Sole-Olle, 2005; Esteller-Moré, 2005). In particular, Castells and Sole-Olle (2005) find that more electoral productive constituencies i.e. those with higher probability of gaining an additional seat and higher turnover are favored with higher infrastructure investment. They do not find any statistical effect of swing states. To measure swing voters, Castells and Sole-Olle (2005) use aggregate voting data. They follow the procedure, originated by Wright (1974), which makes a simplifying guess that historical vote shares of a party evolve according to a time trend. By fitting a linear trend to vote shares, Sole and Castells (2005) compute a long-run vote share, and then estimate densities at the socialist party election result for Spain. Esteller-Moré (2005) incorporates the electoral formula in the

construction of political variables and finds significant effect of swing voters, turnout and district representation in regional parliament on tax administration.

This paper differs from the above studies (except for the data used) in one important aspect, the way swing and loyal regions are measured. We propose two new methods of estimating the number of swing voters which capture multiple parties from individual survey data. Survey data have big advantages over the aggregate voting data as we are able to track individual voting preferences together with ideological preferences and other voter characteristics. The dataset we use is unique as it not only includes voters' preferences on the left-right dimension as many other surveys, but also voters' location on the nationalist/regional dimension.

According to the prediction of Dixit and Londregan (1996), the bigger the number of swings in a region, the higher is the density at the critical value or "cutpoint" of the ideological axis, which divides voters between voting for party A and party B. The first method estimates densities at the cutpoints, where voters are equidistant to the two closest parties. The underlying assumption is that people vote for the closest party (Downs, 1957). To take into account bi-dimensionality of Spanish politics for three party regions, we estimate bivariate densities at the cutpoints on the left-right and nationalist dimensions. The second method counts voters with similar predicted likelihoods of voting for parties in the regions. To estimate the likelihood of vote, we follow the political science literature on voting behaviour (see, for instance, Campbell et al, 1960; Fiorina, 1981; Torcal, 1995). The likelihoods of voting are estimated with the multinomial probit technique and include additional controls for the nationalist sentiment. We also draw from the individual data to proxy incumbents' core supporters better. Next, we use these measures for testing theories of distributive politics.

The focus of this paper is on Spanish discretionary grants. In particular, we study state subventions, which are mainly grants for labour and social policies. These grants are suitable for testing partisan theories, as the central government has a considerable say in their distribution. State subventions are distinct from other grants in that no prescribed formula exists. In fact, the objective of state subventions has not been specified in the legislation (Monasterio and Suarez, 1998). Discretionary grants are economically important: they totaled an annual average of 1222 billion Euros in the period 1986-1996, or some 5 percent of total grants.

We find that political variables enter significantly into allocation of state subventions, and the magnitude of the effect is comparable to that of economic variables. In particular, we find strong evidence for the *loyal hypothesis* and no evidence for the *swing hypothesis*. In fact, Spanish

regions with higher number of swing voters received less in subventions than other regions. In line with the explanation suggested by Cox and McCubbins (1986), the risk-averse incumbent prefers investing in loyal regions, where he knows better preferences and numbers of their supporters.

The paper is organized as follows. Chapter 2 describes existing theories of distributive politics and empirical literature. In Chapter 3 we develop two new methods of estimating the number of swing voters. In the next Chapter the data used is described. Empirical analysis is presented next. The last Chapter concludes.

2. Theories and Evidence on Distributive Politics

This Chapter reviews theories and evidence on distributive politics.

Political factors influencing allocation of public expenditure have been actively studied by economists and political scientists during the last decades. The main focus of this literature is on government expenditures, which are subject to a substantial geographic control by politicians, such as spending on military projects, public works projects, specific intergovernmental grants, etc. There are two broad categories in the literature of distributive politics: *congressional studies* that emphasize incentives of individual legislators, and *partisan models* that focus on the incentives of political parties.

Congressional studies, commonly labeled “pork barrel”, maintain that legislators bring public money to their constituencies to maximize chances of re-election. Ferejohn (1974) in his famous paper of pork barrel politics of rivers and harbors showed that influential members of American Congress - committee members - secured more projects for their constituencies than did their peers in the Congress. Traditional domains of pork barrel politics include defense contracting (Johnston 1979), projects on “rivers and harbors” (Ferejohn 1974). Empirical studies of Congress suffer from two key limitations (Levitt and Potterba, 1999). First, it might be the case that regions that receive above-average levels of federal support are those that have above-average needs. Then, representatives from districts with particular interests (e.g. agriculture) will be attracted to committees with control over policies that affect these interests (e.g. Agriculture Committee). Second, a complex institutional structure of Congress makes it difficult to identify influential members based solely on committee participation.

Alternatively, *partisan models* of distributive politics suggest that political parties rather than individual legislators are the key decision makers. The main hypothesis of partisan models states that parties facing an election will promise transfers that benefit particular groups of voters (Dixit and Londregan, 1996; Linbeck and Weibull, 1987; Cox and McCubbins, 1986; Snyder, 1989). Two (not necessarily excluding) predictions are that parties might favor *loyal* voters, or/and *swing* voters.

Models with swing voter outcomes assume that voters have ideological preferences over the parties but also care about economic material benefits. In each region there is a distribution of ideological preferences, and given a certain level of regional transfers, there will be a critical value or "cutpoint" that divide voters between voting for party A and party B. Then by promising transfers, parties are able to shift the cutpoint to increase their vote share. Parties will then allocate more transfers to regions with higher number of swing voters, or where the density at the cutpoint is higher. Those are regions with relatively many moderates whose relative indifference between ideological programs of parties can by resolved by offers of redistributive benefits (Dixit and Londregan, 1996). Further, the model predicts that low-income groups whose marginal utility of income is higher will be benefited, as they are more willing to compromise their political preferences for additional private consumption.

Instead, the model by Cox and McCubbins (1986) predicts that loyal *"support groups"* will be favoured by grants. In their paper *"support groups"* are defined as those who have consistently supported the incumbent government in the past and to whom it looks for support in the future. The intuition here is that supporters are better targets than swing voters as they are "well known" quantities, and incumbents have relatively precise and accurate account of them. On the other hand, swing groups are by definition "unattached". Cox and McCubbins (1986) made an analogy to an investment decision, where groups of voters are considered as an investment paying off in expected votes. As parties are assumed to be risk averse and investment in loyal voters is assumed to be less risky than in swings, parties prefer investing in loyal voters. An implication of that reasoning might be that in case an incumbent's popularity is decreasing, the incumbent might become risk-seeking as opposed to risk-averse, and invest more in swing groups. This observation is consistent with the Prospect theory by Kahneman and Tversky (1979), where risk attitudes depend on whether someone faces losses or gains.

As noted by Dixit and Londregan (1996), two opposing theoretical predictions are perhaps due to the heterogeneity of redistributive politics itself. This diversity is reflected by empirical studies. Dahlberg and Johansson (2002) find strong support for the swing hypothesis

in the allocation of Swedish ecological grants. To proxy swing voters they use distance between party blocks in the general elections and cutpoint density from the survey data. The latter measure comes from Johansson (2003). She estimates the bias in favour of the socialist bloc using selected questions from the Swedish Election study [1]. The method Johansson (2003) uses involves an arbitrary decision on how many factors should be retained. In particular it restricts the space to one dimension, the estimate of the ideological preferences. However, one can think of spaces with two dimensions, as in the case of Spain. Loyal regions captured by the incumbent's party share of votes have mixed signs and significance.

Levitt and Potterba (1999) find some evidence of the swing hypothesis in the US. More politically competitive regions measured as deviation of average presidential vote received higher federal spending. Case (2001) and Schady (2000) find support for both swing and loyal hypotheses in the case of Albania and Peru, respectively. In Case (2001) the loyal hypothesis is confirmed for grants in both absolute levels and differences, while the swing result is only robust in levels. Thus, in loyal regions politicians were able to influence the history-based level of spending and change in funding over times, while for swing states they only affected the level.

Other political factors also affect the distribution of public spending. Stromberg (2001) argues that turnout positively affects transfers, because the number of potential votes to be won is greater. Empirically, Stromberg (2001) and Ansolabehere and Snyder (2003) confirm that transfers increase with turnout. As suggested by Ansolabehere and Snyder (2003), one possible form of how loyal models work is that spending may mobilize people to vote, and it is easier to mobilize "known quantities" of supporters. In contrast, in swing models turnout is fixed, so party efforts are aimed at "conversion" of potential swings, rather than mobilization.

Another factor that may influence allocation of transfers is the partisanship of sub-national governments. Dasgupta et al (2001) propose a political economy model of centre-state transfers, which predicts that grants will be biased into the regions which are ruled by the same party as in the federal centre. Then the ruling party reaps an entire electoral benefit of any additional expenditure in the state, and there is no leakage due to other party's claims. Testa et al (2004) show support for Dasgupta et al's (2001) hypothesis.

Most of the papers on distributive politics consider bipartisan (and often winner-takes-all) electoral systems. What changes if one consider a case with a multiparty system? First, some measures of theories of distributive politics become inappropriate. This is the case of "closeness" measure, which is a standard proxy of swing states with two-party competition.

[1] For a more detailed discussion, see Johansson (2003) and Dahlberg and Johansson (2002).

When more than two parties compete, it is not clear which election result might be defined as 'close'[2].

Second, one should take into account the electoral system, which under proportional system might change relative political productivity of districts. This is the case of Spain. Spain has multiple parties and proportional electoral system with some corrections (Nohlen and Schultze, 1985). Votes are transferred into seats with the help of the d'Hondt formula, with a threshold of a 3 per cent of the votes. Each electoral district is guaranteed at least two seats, with additional seats allocated according to the population (Colomer, 2003). It results in the fact that in small electoral districts (like Soria) fewer voters may elect a deputy than in big districts (like Barcelona).

Two recent papers study the effects of electoral variables within the framework of a Spanish multiparty system (Castells and Sole-Olle, 2005; Esteller-Moré, 2005). Castells and Sole-Olle (2005) have analyzed economic versus political factors influencing allocation of public investment in infrastructure. To proxy swing and loyal voters they use aggregate electoral data. The main finding of their paper is that political factors have only limited impact on allocation decisions, adding several percentage points to the explanatory power of the model. In particular, Castells and Sole-Olle (2005) find that more electoral productive constituencies i.e. those with higher probability of gaining an additional seat (defined as *1/vote margin*, or number of votes that the incumbent party would have needed to gain one additional representative in the district in the last election) and higher turnover are favored with higher infrastructure investment. However, they do not find statistical confirmation either for the swing or for the loyal hypotheses.

Many studies also investigate the existence of an opportunistic electoral cycle, suggested by Tufte (1978) and further formalized in a seminal work by Nordhaus (1975)[3]. The basic idea is that economic movements just before election can be decisive, and voters reward incumbents for prosperity and punish for recession. The theory predicts higher expenditure (transfers) before elections.

In this paper, we test predictions of *partisan* theories of distributive politics for a multiparty system. We use various proxies for loyal and swing hypotheses from aggregate and survey data. We also incorporate into the analysis other theories of distributive politics. In addition, we attempt to control for the Spanish electoral system as some regions have higher

[2] See Snyder (1990) for a discussion.
[3] Alesina, Roubini and Cohen (1997) provide detailed survey of theoretical and empirical literatures of opportunistic political cycles.

electoral productivity than others. Finally, we also test for the existence of an electoral political cycle.

In the next Chapter we develop two methods of estimating the number of swing voters when more than two parties compete from individual survey data.

3. Estimating Swing Voters

The primary motivation for estimating the number of swing voters is to test theories of distributive politics. Analysis of swing voters also adds to the research on voting behaviour. The focus of the classical voting literature used to be on partisan voters while volatile voters were treated as residual (see e.g. Cambell et al., 1960; Niemi and Weisberg, 1993). However, decline of partisanship results in the fact that there are more voters who are likely to change their preferences. As observed by Niemi and Weisberg (1993), "politics has become more volatile; voting patterns that once seemed totally stable have now become remarkably fluid". Wattenberg (1991) suggests that the electorate becomes more neutral (in Niemi and Weisberg, 1993). And Hillygus and Jackman (2003) summarize previous findings on volatile voters - they are characterized by low levels of information, party affiliation, and political interest.

In Spain swing voters are concentrated in the centre of the ideological left-right scale. In the 80s they used to vote for the socialist party PSOE, while in the 90-s the majority gave their votes to the conservative party PP (Torcal and Medina, 2000). Molas and Bartomeus (1999) give descriptive analysis of swing voters in Catalunya. For the years 1991-1998 swings account for 30 percent of total voters. Two types of swings are distinguished: one that changes votes between subsequent elections, and the other, which swing votes between different types of elections (e.g. general election and regional election). Molas and Bartomeus (1999) do not find that swings are significantly different from loyal voters as far as socio-demographic characteristics are concerned, neither do they have less interest in politics. What is typical of swing voters is that they don't have sympathy toward any political party and their swing behaviour is stable over time.

3.1 Density at the Cutpoints

3.1.1 Assumptions

We define a "cutpoint" where a voter is equidistant to parties. At the cutpoint the voter is indifferent between voting for parties and therefore might swing his/her vote. The underlying assumption is that individuals vote for the party nearest to them on the spatial dimension (Downs, 1957)[4]. The data suggests that indeed the lower the distance to the parties (defined as the absolute difference between the party location and self location), the more votes they receive.

Following (Colomer, 2003), we assume that eleven of the Spanish regions (so called autonomous communities) are characterized by (imperfect) bi-party systems, where electoral competition takes place on the ideological left-right spectrum. These are regions, where the two major statewide parties, the socialist party PSOE and the conservative party PP, together always account for over 80 percent of the vote (Colomer, 2003). In regions with strong regional/national identities, electoral preferences might be expressed in terms of these identities, in addition to the classical left-right dimension. This bi-dimensionality is typical for Catalonia, the Basque country and Galicia, the so-called historic nationalities in Spain, which have a long tradition of distinct national identity (Garcia-Milà and McGuire, 2006), but also for Aragon, Canarias and Navarra, where it has developed more recently as a result of the decentralization. Due to data limitations, Navarra was excluded from the second group as votes for the regional party UPN were in coalition with PP. For a regional party, the biggest and most influential one at that time is chosen. For Catalonia it is CIU, for the Basque Country - PNV, for Galicia - BNG, for Canarias - AIC, and for Aragon - PAR.

We maintain the assumption of the sophisticated voter so we discard observations with missing self- or/and party placement on ideological dimensions or with inconsistent rankings of parties. We think that some of these observations result from the measurement error. The rest violate the sophisticated voter assumption and therefore we think we cannot learn from these

[4] This is of course a simplification as theories of voting behaviour suggest other vote determinants are at play such as economic voting, candidate importance, and socio-demographic characteristics, which may or may not reflect ideological vote (see, for instance Niemi and Weisberg, 1993). Our second measure – swing count measure – will control for other vote determinants.

observations. By inconsistent ranking we understand a ranking of parties which is not reasonable in terms of their ideological platforms.

We also assume that locations of the parties are associated with their mean position in each region.

3.1.2 Normalization

Respondents report self- and major parties locations on the left-right ideological dimension and on the centralist-nationalist dimension. We are interested in where a respondent places himself *relative* to the parties. So, for self-locations to be comparable on a scale where parties are fixed at their regional means, one needs to normalize it[5]. Normalization is required as people differ a lot on where they place parties (for instance, the *psoex* mean is 4.23 and standard deviation is 1.58).

A possible normalization is to rescale self-locations such that individual locations of parties coincide with regional averages. Equation (1) does exactly this for the case of two parties. Equations (2)-(4) are special cases. If individuals give parties the same score, they will be translated to the left of the mean PSOE if *selfx<psoex*, or to the right of the mean PP if *selfx>ppx*. If individuals place themselves and parties in the same location, then those are assumed to be in middle of two parties (4).

$$psoe\overline{x} + \frac{selfx - psoex}{ppx - psoex} \times \left(pp\overline{x} - psoe\overline{x} \right), \text{ if } psoex \neq ppx \qquad (1)$$

$$psoe\overline{x} + \left(selfx - psoex \right), \text{ if } psoex = ppx \text{ and } selfx < psoex \qquad (2)$$

$$pp\overline{x} + (selfx - ppx), \text{ if } psoex = ppx \text{ and } selfx > ppx \qquad (3)$$

$$\left(psoe\overline{x} + pp\overline{x} \right)/2, \text{ if } psoex = ppx = selfx, \qquad (4)$$

where $psoe\overline{x}$, $pp\overline{x}$ are regional parties mean locations.

Table 1 shows self, party and normalized self locations for some respondents in Andalusia**.**

[5] An illustrative example: Assume psoe and pp are fixed at their means, 4 and 8 correspondingly on the scale from 1 to 10. Someone who places herself at 5, psoe at 2 and pp at 6 is assumingly a PP voter. However, once he is put on the common scale, he becomes closer to psoe.

Table 1. PSOE, PP, Self and Normalized Self Locations for Some Respondents in Andalusia

N	PSOE location-X	PP location-X	Self location-X	Self location-X, normalized
1	**3**	**8**	**5**	**5.72**
2	5	8	8	7.95
3	4	5	4	4.24
4	**6**	**6**	**3**	**1.24**
5	5	9	3	2.38
6	3	8	3	4.24
7	**3**	**9**	**3**	**4.24**
8	4	10	9	7.33
9	3	9	3	4.24
10	3	10	9	7.42
11	3	10	4	4.77
12	4	8	4	4.24
13	3	10	3	4.24
14	4	9	4	4.24
15	3	9	3	4.24
	Mean PSOE location-X	Mean PP location-X		
	4.24	7.95		

For instance, the first respondent places PSOE at 3 on the scale [1, 10], while the regional mean placement of PSOE is 4.24. His PP placement is very close to the regional mean placement. So, to preserve his relative distances to parties, his self placement on the common scale should be to the right of his placement on the individual scale (5.72 and 5, correspondingly). The one who places himself at the same location as other party (like, for example, individual 7) will be placed in the mean location of that party. If someone places parties say at 6 (observation 4), and himself to the left, he will be also to the left of the mean PSOE location.

When there are three parties in a region, we can normalize (rescale) individual preferences (by multiplying by a constant and adding a constant) so that his location of TWO parties coincides with the region averages. However, the location of the third party could only coincide with the average by coincidence. Therefore, we need to choose two parties with respect to which to normalize individual preferences.

We describe one of the possible normalizations here (Normalization 1). We consider two cases. First, when respondents distinguish well between parties, or parties are said to have strong ranking, we normalize with respect to the two closest parties to the individual (see Appendix, for formal definitions of the normalization). The intuition here is that people who see

clear differences between all parties may be more precise in locating the two closest parties than the most far. Once the pair of two closest parties is identified, the normalization follows Equation 1 of the Appendix. In the second case, when at least two parties are located similarly (or the ranking of the parties is not strong), individuals are better characterized by pairs of the two distant parties, where they do see the differences. Then we take the average between the normalizations with respect to the two more distant party pairs (see Appendix).

We also normalized with respect to other parties (Normalizations 2-4, see Appendix for details) and checked if the normalization affects the estimated density. It appears that estimates of densities do not depend on the normalization. Resulted correlation coefficients are around 0.9. Examples of normalization with three parties are presented in Table 2.

Table 2. PSOE, REG, PP, Self, and Normalized Self Locations for Some Respondents in Aragon

N	PSOE location-X	REG location-X	PP location-X	Self location-X	Self location-X, normalized
1	3	9	10	3	4.19
2	5	8	8	3	2.24
3	5	7	7	5	4.19
4	4	6	8	3	3.09
5	6	7	9	3	1.98
6	5	5	9	3	4.00
7	3	6	6	6	7.11
8	5	7	7	7	7.11
9	5	9	9	4	3.46
10	5	6	6	5	4.19
11	4	6	8	4	4.19
12	6	6	7	5	2.72
13	4	6	6	4	4.19
14	4	6	7	4	4.19
15	5	5	8	5	5.28
Mean location	PSOE	REG	PP		
	4.19	6.38	7.85		

3.1.3 Estimating Densities at the Cutpoints

Once we have respondents and parties on a common scale, we can estimate the number of *swing* voters. Define the cutpoint where a voter is equidistant to parties. Then, for two party regions, we estimate a univariate kernel density at the cutpoint. For three party regions, there is infinity of equidistant points between the two closest parties and their collection is a line. We

estimate bivariate kernel density along equidistant lines *y=a+bx*, where y and x are found from the following equation using Euclidean distances:

$$(x - party1\bar{x})^2 + (y - party1\bar{y})^2 = (x - party2\bar{x})^2 + (y - party2\bar{y})^2 \qquad (5)$$

where $(party1\bar{x}, party1\bar{y})$ and $(party2\bar{x}, party2\bar{y})$ are mean locations of parties 1 and 2.

Figures 1 and 2 present bivariate densities and contour plots for Catalonia. Figure 1 shows how respondents place themselves on the common (normalized) scale. In addition to the view from above of the distribution of normalized self-locations, contour plots or maps also show mean locations of the parties (denoted by PSOE, PP and REG), and equidistant lines along which the integration has been done (See Figure 2).

Figure 1. Bivariate Density in Catalonia

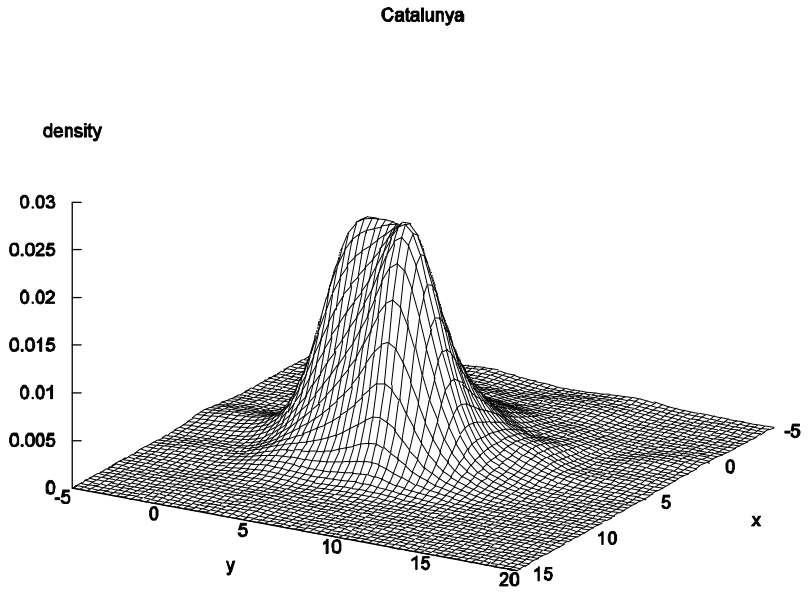
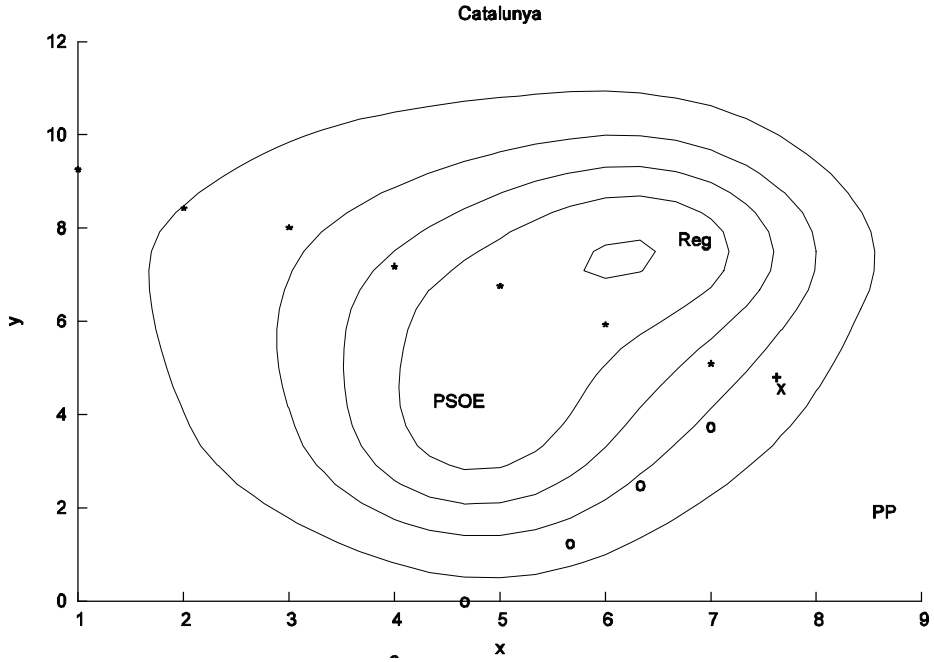


Figure 2. Contour Plot of the Bivariate Density in Catalonia



For the purpose of further analysis, we are only interested in PSOE swings. There are two equidistant lines from PSOE and the relevant parts are up to the crossing. One line characterizes swings between PSOE and REG - denoted by stars, and the other – swings between PSOE and PP - denoted by circles (See Figure 2). For the number of swings in a region, the relevant factors are the density (i.e. the top of the mountain) and how far equidistant lines are from the top (i.e. the inner circle on the picture). In the example of Catalonia there are only few swings between PSOE and PP, and the majority changes their votes between PSOE and REG.

Table 3 shows the estimated densities at the cutpoints for all 17 regions. The higher the estimated density, the more swing voters we expect to find.

Table 3. Estimated Densities at the Cutpoints for 17 Spanish Regions

Region	Density
Asturias	0.05
Cantabria	0.07
Murcia	0.07
Extremadura	0.07
Valencia	0.08
Andalusia	0.09
Castilla-la-Mancha	0.10
Rioja	0.11
Madrid	0.11
Aragon*	0.12
Navarra	0.13
Castilla-Leon	0.13
Basque Country*	0.14
Canarias*	0.15
Baleares	0.15
Catalonia*	0.17
Galicia*	0.18

Note: Regions with * denote estimates of bivariate density.

3.2 Counting of Swing Voters

3.2.1 Assumptions

The basic assumption of the Counting estimate is that people with similar likelihoods of votes for parties in a region are expected to behave as swings, who change their vote from one election to another.

3.2.2 Estimating the likelihood of vote

To estimate the likelihood of vote, we follow the political science literature on voting behavior (see, for instance, Campbell et al, 1960; Fiorina, 1981; Torcal, 1995). In particular, as determinants of vote we include distances to parties (ideological vote), evaluation of their leaders, evaluation of incumbent performance in the government (retrospective vote), and socio-demographic characteristics. For regional votes, following other research, we added nationalist sentiment and knowledge of the regional language (Perez-Nievas and Fraile, 2000).

The following equation is estimated with the multinomial probit model:

$$Vote_i = \alpha + \beta Distance_i + \delta Leader_i + \gamma Performance_i + \eta IndividialCharacteristics_i +$$

$$+\lambda_1 Nationalist_i + \lambda_2 Language_i + \varepsilon_i, \qquad (6)$$

For two-party regions, the dependent variable $Vote_i$ has three alternatives. It is equal to 1 if individual *i* voted for PSOE in the last election, 2 – if voted for PP and 3 - if voted for other party. For three-party regions, the dependent variable in addition has the fourth alternative – 4 if voted for the regional party. $Vote_i$ only includes observations on individuals who voted for a particular party in the last election (1989).

To calculate ideological $Distance_i$, for two-party regions we take absolute difference of the self and parties (PSOE and PP) locations on the left-right (X) dimension. In addition, for Catalonia, Pais Vasco, Aragon, Galicia, and Canarias we take absolute difference of the self and parties (PSOE, PP and regional party) location on the nationalist (Y) dimension (on the scale from 0 to 10). As in case of the Density measure, the biggest and most influential regional party is chosen (See above).

We also tried a combined measure of distances to PSOE and PP - a difference between distance to PSOE and distance to PP - which performed worse than distances to PSOE and PP separately in the regression. We also included another measure of distance to a particular party - from the survey question "are you located close-distant to a party?" on the scale from 0 to 5. Overall, both measures performed similarly, so we proceeded with the distance on the 0-10 scale.

Variable $Leader_i$ is the evaluation of PSOE and PP leaders for two-party regions (on the scale from 0 to 10, from very bad to very good), and in addition evaluation of the regional party leader for three-party regions. $Performance_i$ is the evaluation of the ruling party (PSOE) during last ten years from 1 (very good) to 5 (very bad). $IndividualCharacteristics_i$ include age, subjective class (from 1 (high) to 5 (low)), income, occupation and religion (from 1 (strong catholic) to 7 (atheist). For three-party regions, we included variable $Nationalist_i$ for the nationalist sentiment (i.e. I feel more Catalan than Spanish) and the knowledge of regional $Language_i$ (from 1 (speaks and writes) to 4 (does not understand).

We present results of the Multinomial probit estimation for the vote for PSOE (Alternative 1) in the Appendix (Table A3). The model (6) performs well. The overall percentage of correct

prediction for two-party regions is 80 percent, for three party regions it is around 75 percent[6]. Most of the predictors are significant and have expected signs.

Then, for each individual we obtained predicted probabilities of votes from (6). Summary statistics are in the Table 4.

Table 4. Summary Statistics of the Predicted Probabilites of Votes

	Variable	Vote PSOE	Vote PP	Vote Other	Vote REG	
2 Party Regions	Mean	0.60	0.24	0.16		
	Standard Deviation	0.34	0.33	0.18		
	Observations					5037
Aragon	Mean	0.46	0.30	0.12	0.11	
	Standard Deviation	0.35	0.36	0.15	0.15	
	Observations					292
Canarias	Mean	0.66	0.17	0.14	0.03	
	Standard Deviation	0.29	0.24	0.13	0.04	
	Observations					272
Catalonia	Mean	0.44	0.05	0.17	0.33	
	Standard Deviation	0.38	0.15	0.22	0.33	
	Observations					470
Galicia	Mean	0.48	0.29	0.14	0.09	
	Standard Deviation	0.36	0.37	0.17	0.22	
	Observations					313
Basque Country	Mean	0.27	0.02	0.40	0.31	
	Standard Deviation	0.33	0.11	0.34	0.25	
	Observations					291

3.2.3 Counting of Swing Voters

Further, we compare predicted probability of vote for PSOE with the next biggest probability as we are only interested in the PSOE swings. We then count people in a region who have similar probabilities of votes to proxy swing voters. We consider various ranges of similar probabilities: up to 10 percent, up to 15 percent and up to 20 percent. Finally, we calculate ratios of PSOE swings to the total number of respondents in a region (see Table 5).

[6] The outcome with highest predicted probability is assumed to be the predicted outcome.

Table 5. Counting Swing Voters 10, 15, and 20.

Region	Counting Swing 10	Counting Swing 15	Counting Swing 20
Asturias	0.05	0.08	0.09
Castilla-la-Mancha	0.04	0.06	0.09
Cantabria	0.05	0.08	0.09
Castilla-Leon	0.05	0.07	0.10
Andalusia	0.05	0.07	0.10
Extremadura	0.03	0.07	0.10
Baleares	0.06	0.08	0.10
Vasque Country	0.07	0.10	0.11
Canarias	0.03	0.08	0.11
Valencia	0.06	0.09	0.11
Catalonia	0.08	0.09	0.12
Galicia	0.07	0.10	0.12
Navarra	0.08	0.11	0.13
Rioja	0.07	0.11	0.13
Aragon	0.08	0.10	0.14
Murcia	0.09	0.11	0.14
Madrid	0.09	0.12	0.15
Correlation with Density Measure	0.12	0.25	0.29

Next, we use both estimates of the number of swing voters for testing theories of distributive politics.

4. The Data

Annual series on state subventions ('subvenciones gestionadas') come from the database *BADESPE*, developed by the Spanish Institute of Fiscal Studies (http://www.estadief.minhac.es). Those are grants from the federal government to regional governments[7]. This is the only level at which discretionary grants data are available.

Subventions are mainly spent on programs of professional occupation and employment creation and additional pensions to the old ('pensiones asistenciales', i.e. pensions to the Spanish citizens, who live outside Spain). Up to 1991, subventions were also used as an additional channel of federal transfers for education to high responsibility regions (i.e. to regions where education was devolved earlier). Subventions - in smaller proportions - were also

[7] Spain is divided into 17 "self-governing communities" ('Comunidades Autónomas'), or regions, 50 provinces and about 8000 municipalities.

allocated to agriculture, public investment in infrastructure, research and technological development.

Economic and demographic controls are available from the Spanish Institute of Statistics (INE). The source of the data on general parliamentary elections to the Lower House (Congress of Deputies) is the Spanish Interior Ministry (http://www.elecciones.mir.es/MIR/jsp/resultados). We use the data on elections of 1982, 1986, 1989 and 1993. Data on regional elections is from eleweb, the webpage on elections and public opinion (www.**eleweb**.net). Individual survey data are from the CIS (Centro de Investigaciones Sociológicas) studies 2025-2041 from 1992.

We will analyse data on 15 Spanish regions from 1986 to 1996. Basque Country and Navarra were excluded from the analysis, as these regions were not eligible for those types of grants. During this period the incumbent government was ruled by the Socialist party PSOE (*Partido Socialista Obrero Español*). Until 1993 PSOE held a parliament majority, and in 1994-1996 it ruled as a minority government with informal support of the nationalist Catalan party – Convergencia i Union (Linz and Montero, 1999).

5. Analysis

Models of distributive politics assume that incumbents believe that transfers help them in re-election. So, they can observe results of the past elections, and pursue their strategy with regard to the geographical distribution of transfers. To test theories of distributive politics we estimate models in which *past* electoral outcomes are used to predict *current* transfers.

5.1 Specification

The following equation is estimated with the pooled OLS on regional annual data:

$$SUBV_{it} = \alpha + \beta Econ_{it} + \delta_1 Loyal_{it-1} + \delta_2 Swing_{it-1} + \delta_3 Polit_{it-1} + \gamma_1 High_{it} + \gamma_2 Canary_i + \tau_t + \varepsilon_{it}\ i=1,\ldots 15;\ t=1986,\ldots 1996,$$

where $SUBV_{it}$ is the logarithm of per capita subventions in region *i* at time *t*. $Econ_{it}$ is a vector of economic and demographic controls, which are determined by equity and efficiency considerations. It includes *Log of output (GDP) per capita*, *Log of population*, *Share of young* (up

to 14 years) and *Unemployment rate*[8]. *Log of output per capita* is expected to be negative according to equity considerations; *Share of young* and *Unemployment rate* are expected to be positive because of the nature of grants. The sign on the *Log population* depend on the strength of the two following factors. On one hand, it is less costly to provide public goods in bigger regions because of economies of scale. On the other hand, congestion results in deterioration of the quality of public goods so an additional transfer is required in populated regions (see Musgrave and Musgrave, 1989).

Economic controls are assumed to be from the same period as the dependent variable because they are intended to capture regional 'needs' in particular transfers[9].

As was explained above, subventions were partly spent on additional grants on education in a group of regions. To control for this institutional feature of subventions we include $High_{it}$ – a dummy that equals 1 for *High responsibility regions* and for years 1986-1991[10]. I also include a dummy for the Canary Islands *(Canary)*, due to its special fiscal status and far distance from the peninsula.

As in all subsequent regressions, we include year dummies τ_t to control for the fact that the total amount of funds received has changed over time.

Variables $Loyal_{it-1}$ and $Swing_{it-1}$ include proxies to test loyal and swing hypotheses. Following other empirical papers, to proxy loyal regions we use the pro-incumbent share of vote in past general parliamentary elections, or *Socialist vote share* for the period studied. However, it is rather a poor proxy for designating a region as a "core supporter" (Rodden and Wilkinson, 2004). Apart from core supporters, who by definition always vote for the incumbent, vote shares also include some undecided voters and those who vote because of other considerations (e.g., economic or electoral campaign driven). *Socialist vote share* is constant between elections.

We think that a better proxy of supporters can be obtained from the individual survey data. We include variable *Loyal supporters* from the CIS electoral survey, which is a ratio of respondents who feel close or very close to PSOE in a region. In the political science literature

[8] We have also included share of agriculture in the regional product, and it was insignificant across specifications, probably reflecting low weight of agriculture in subventions.
[9] One might argue that the most recent data available to decision makers is from the previous period. To check for that assumption, I also estimated equations with lagged economic variables, and the results were unchanged.
[10] High responsibility regions include Andalusia, Canary Islands, Catalonia, Galicia and Valencia.

this question is usually described as party identification (see, for instance, Torcal et al, 2001)[11]. This and other survey variables are available only as cross-section[12]. Thus we assume that political characteristics are constant over time for survey proxies. We think that this assumption is reasonable as the survey is from 1992, and it is in the middle of the sample period under investigation.

$Swing_{it-1}$ includes *Density at the cutpoints*, *Counting swing voters*, *Actual swings*, *Undecided* and *Swing dummy*. All proxies but the last are from the CIS survey. For them, $Swing_{it-1} = Swing_i$.

D*ensity at the cutpoints* is estimated using individual survey data on the left-right dimension for two-party regions, and bivariate density along the equidistant points in both left-right and nationalist-centralist dimensions for three party regions (see Chapter 3 for details).

The interpretation of the density at the cutpoints is the same in case of two- and three-party regions – it is a probability mass just in the middle between PSOE and its competitors. However, the method of computing density at the cutpoint is quite different for two- and three-party regions, where we consider two dimensions. We should take this into account in analyzing the data, in particular guarding against the possibility that the different methodology results in a somewhat different measure, in size or scale. For example, if the different methodology always produced higher values of the density in three-party regions, the coefficient of this indicator could be capturing that the left-hand-side variable tends to be higher in three party regions for other reasons, independent of the amount of swing voters. The density at the cutpoint would then be spuriously significant, just because it is a proxy for a three-party region dummy. In order to guard against this possibility, we combine the density at the cutpoint measure with a *three-party region dummy*[13]. When adding this dummy, we are in effect using only the variation within the two-party regions group and within three-party group, so we are losing some information, but we ensure better that the coefficient on the density measure captures only the effect of swing voters. In addition, we also control for the three party dummy interaction with the density measure, in order to allow the possibility of a different slope of the relationship in three-party regions.

[11] The corresponding question in the survey is: Do you find yourself politically very close, close, neither close not far, far and very far to PSOE?
[12] CIS also runs post-electoral surveys every four years after each general election. These surveys have the same question on the closeness to the incumbent. However, we cannot use it as for some regions the sample size is too small (e.g. 20 observations) and results are inconclusive.
[13] The three-party region dummy is equal to 1 for Catalonia, Aragon, Galicia and Canaries.

Counting swing voters counts people with similar likelihoods of voting for parties in a region. We assume that likelihoods are similar if the difference between the two closest likelihoods does not exceed 15% (C*ounting swing voters, 15*) or 20% (C*ounting swing voters, 20*). Those voters are likely to change their votes from one election to another. To predict individual likelihoods to vote, we run multinomial probit regressions, which include standard variables in the political science (See Chapter 3 for details). *Actual swings* are those who swung from one election to another[14]. *Undecided* are those who at the moment of the survey (1992) still did know for which party they would vote in the general election of 1993.

Swing dummy uses information from aggregate election data and is equal to 1 if in a region there is a swing from the past to the next election in terms of seats.

$Polit_{it-1}$ controls for other theories of distributive politics and includes *Turnout*, measured as total votes over population (Stromberg, 2001); dummy incumbent *Majority in the regional government* equal to 1 if the socialist party (the incumbent over the period of study) won majority (absolute or simple) in terms of seats in the past regional elections (Dasgupta, 2001); *Catalonia dummy* for years 1994-1996. The last variable tries to capture the informal coalition between the incumbent socialist government and the Catalan nationalist party. It might be the case that the socialist government used discretionary grants to reward its supporters in the parliament.

To control for the Spanish electoral system, we include the variable *Price of the seat* in a region, calculated as total votes over seats. We would expect parties to invest in districts with lower 'price' of the seat. Note that one can incorporate into analysis direct working of the electoral system through d'Hondt formula, as it is done in Castells and Sole-Olle (2005). However, it can be only applied at the electoral district level, which is not the case with our data[15].

5.2 Econometric Issues

Estimating the effect of previous elections on current expenditures presents a number of econometric problems. The most obvious is probably the simultaneity bias. Politicians attempt to manipulate transfers because they believe that these have an effect on elections. That is $Vote_t = f(Transfer_{t-1})$, or results of elections might be related to the past history of transfers. If there is serial correlation in transfers, and we fail to control for lagged transfers, our coefficients in the

[14] In the CIS survey of 1992 we have information of the past vote (general election of 1989) and the intention to vote in 1993.
[15] There are 52 electoral districts in Spain, which corresponds to provinces. This analysis is done on the regional (Autonomous Communities) level, as the data on transfers is only available at that level.

equation (1) might be biased. We control for that by including lagged subvention $SUBV_{it-1}$ into equation (1). Estimation using the procedure developed by Arellano and Bond (1991) for dynamic panel models shows that there is no serial correlation in subventions. Lagged dependent variables are insignificant.

Another possible caveat is the correlation between the explanatory variables and the regional unobserved effect c_i. The standard procedure to control for unobserved effects is to include regional fixed effects. We include *High* and *Canar* dummies to control for that. By that we assume that regional fixed effect is driven by the features of the institutional framework (eligibility for grants and specific treatment). We check consistency of the OLS estimates, and the *Hausman test* does not reject H_o of the coefficients similarity with the fixed effects model (which is consistent under both H_o and H_{alt}). We also estimate robust standard errors to control for potential serial correlation in the error terms (see Wooldridge, 2002).

5.3 Results

Table 6 presents estimates of the economic variables and controls on the logarithm of per-capita subventions.

Table 6. The Effect of the Economic Variables and Controls on the Distribution of Per-Capita Subventions, 1986-1996

Log Subventions	(1)	(2)	(3)	(4)
Log Income (GDP)	-0.31	-1.01	-0.93	-1.02
	[0.14]**	[0.22]***	[0.21]***	[0.21]***
Log Population	0.18	0.18	0.10	0.13
	[0.04]***	[0.04]***	[0.03]***	[0.04]***
Share of young	0.09	0.09	0.07	0.06
	[0.02]***	[0.01]***	[0.01]***	[0.01]***
Unemployment rate	0.00	-0.01	-0.01	-0.01
	[0.01]	[0.01]	[0.01]	[0.01]
High responsibility regions dummy			0.46	0.38
			[0.08]***	[0.09]***
Canary dummy				0.39
				[0.12]***
Year dummies	No	Yes***	Yes***	Yes***
Observations	165	165	165	165
Adjusted R-squared	0.43	0.62	0.68	0.71

Note: in this Table and in the Tables below (if not specified otherwise) robust standard errors in brackets; * significant at 10%, ** significant at 5%, *** significant at 1%.

Column 1 only includes economic variables, and then in Columns 2 to 4 we add subsequently year dummies, high responsibility regions dummy and Canary dummy. The basic specification has good explanatory power and expected signs for most of the regressors. Poor regions obtain significantly more in subventions as equity considerations suggest, with young benefiting due to spending on education. Both high responsibility regions and Canary dummies are positive and significant confirming institutional features of subventions.

The sign of the logarithm of population is positive suggesting the congestion explanation. Apparently, the incumbent government takes into account the additional cost of crowding on public services and spends more in populated regions. Political economy might provide an additional explanation for that. In bigger regions there are more potential voters to appeal to, so a program of professional occupation carried out say in Andalusia would return more votes for the incumbent than a similar program in Rioja.

The unemployment rate turns out to be uncorrelated with subventions per capita. However, when adding political variables, it becomes marginally significant and negative. The

opposite sign of the unemployment variable is especially noteworthy given that a big part of subventions was directed to the programs of professional occupation and employment creation which are aimed at the unemployed. We also check the participation rate (ratio of labour force to the population), and it also entered significantly with the opposite than expected sign. Some explanation might be due to the fact that the National Program of Professional Occupation was in its initial stages at the time studied.

Table 7 and Table 8 add estimates of various political variables on the logarithm of per-capita subventions. Table 7 includes *Socialist vote share* based on the aggregate data as a proxy for core supporters, while Table 8 includes *Loyal supporters* from the survey data. They also include various swing proxies from the individual data and other political variables. Both tables include economic controls and institutional dummies (*High* and *Canary* dummies) from Table 6, year dummies and the three-party regions dummy. The three-party regions dummy was included in all specifications (and not only in the specification with the *Density at the cutpoints*) as it appeared to be an important control.

Table 7. The Effect of the Socialist Vote Share, Swing Proxies and Other Political Controls on the Distribution of Per-Capita Subventions, 1986-1996

Log Subventions	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Socialist Vote Share	2.40	2.06	3.24	3.17	2.68	2.51	2.99
	[0.76]***	[0.77]***	[0.73]***	[0.67]***	[0.73]***	[0.70]***	[0.73]***
Counting swing, 15	-3.78						
	[1.88]**						
Counting swing, 20		-5.63					
		[1.69]***					
Density at the cutpoints			2.15	-2.67			
			[1.52]	[1.81]			
Three-party * Density				11.96			
				[3.16]***			
Actual swings					-2.10		
					[1.80]		
Undecided						-1.78	
						[0.80]**	
Swing dummy							-0.01
							[0.11]
Turnout	1.29	1.94	1.60	1.30	0.67	0.92	1.12
	[0.83]	[0.85]**	[0.92]*	[0.85]	[0.91]	[0.85]	[0.85]
Log Price of the seat	-0.14	-0.21	-0.01	-0.59	-0.23	-0.30	-0.24
	[0.14]	[0.13]*	[0.19]	[0.23]**	[0.13]*	[0.13]**	[0.13]*
Majority in the regional government	-0.14	-0.10	-0.14	-0.10	-0.17	-0.17	-0.18
	[0.07]**	[0.06]	[0.07]*	[0.07]	[0.06]***	[0.06]***	[0.06]***
Observations	165	165	165	165	165	165	165
Adjusted R-squared	0.77	0.78	0.77	0.79	0.77	0.77	0.76

Note: This Table includes economic controls and institutional dummies from Table 1, year dummies and the three-party regions dummy.

Table 8. The Effect of the Loyal Supporters, Swing Proxies and Other Political Controls on the Distribution of Per-Capita Subventions, 1986-1996

Log Subventions	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Loyal supporters	2.01	1.76	2.29	2.15	2.51	2.02	2.28
	[0.61]***	[0.61]***	[0.57]***	[0.56]***	[0.57]***	[0.58]***	[0.57]***
Counting swing, 15	-4.34						
	[1.84]**						
Counting swing, 20		-5.85					
		[1.68]***					
Density at the cutpoints			0.54	-4.12			
			[1.53]	[1.82]**			
Three-party * Density				11.64			
				[3.24]***			
Actual swings					-4.22		
					[1.66]**		
Undecided						-1.94	
						[0.83]**	
Swing dummy							-0.06
							[0.10]
Turnout	1.57	2.20	1.69	1.43	0.32	1.21	1.55
	[0.81]*	[0.82]***	[0.98]*	[0.93]	[0.90]	[0.85]	[0.84]*
Log Price of the seat	0.04	-0.07	0.00	-0.58	-0.02	-0.15	-0.07
	[0.13]	[0.12]	[0.20]	[0.24]**	[0.13]	[0.13]	[0.13]
Majority in the regional government	-0.10	-0.07	-0.12	-0.08	-0.13	-0.13	-0.14
	[0.06]*	[0.06]	[0.07]*	[0.07]	[0.06]**	[0.06]**	[0.06]**
Observations	165	165	165	165	165	165	165
Adjusted R-squared	0.78	0.79	0.76	0.79	0.78	0.77	0.76

Note: This Table includes economic controls and institutional dummies from Table 1, year dummies and the three-party regions dummy.

The results in Table 7 and Table 8 show that core supporters of the incumbent government received disproportionately large share of subventions. This result is robust across specifications. The coefficient on both proxies of core supporters is positive and significant at the 1% level.

What is the magnitude of these estimated effects? Table 9 shows that, ceteris paribus, an increase in one standard deviation in *the vote for the Socialist party* resulted in an 18% increase in per-capita subventions (Column 1 of Table 9). We took the average coefficient under Socialist vote share across columns 1-7 of the Table 7 multiplied by its standard deviation. A similar increase in *Loyal supporters* resulted in 10% increase in per-capita subventions. The effect of the core supporters' measures is large indeed and is comparable to the effect of the economic variables (See Table 9).

Table 9. The Magnitude of the Political and Economic Variables on the Per-Capita Subventions

	(1)	(2)
Loyal proxies:		
Socialist Vote Share	0.18	
Loyal supporters		0.10
Swing proxies:		
Counting swing, 15	-0.06	-0.07
Counting swing, 20	-0.11	-0.11
Density at the cutpoints*	-0.10	-0.16
Actual swings	-0.06	-0.12
Undecided	-0.07	-0.07
Political proxies:		
Turnout	0.06	0.07
Log Price of the seat	-0.05	-0.02
Economic variables:		
Log Income (GDP)	-0.21	-0.30
Log Population	0.12	0.11
Share of young	0.23	0.25

Note: Each cell reports the effect of a change of one standard deviation of a variable in question on the Logarithm per-capita of Subventions; Column 1 corresponds to Table 2, and Column 2 corresponds to Table 3; Density at the cutpoints* is from Specification 4, Tables 2 and 3.

Various tests of the swing hypothesis suggest that the incumbent government punished swing regions by spending less discretionary grants there. All swing proxies but density at the cutpoints enter with negative signs with significant coefficients on most swing measures. In terms of the magnitude, the negative effect of swing regions is similar to the positive effect of loyal regions (see Table 9). One standard deviation increase in the swing proxies leads to a decrease in per-capita subventions in the range of 6-16% depending on the specification.

The density measure is positive and marginally significant in the specification with the *Socialist vote share*, and is positive and insignificant in the specification with *Loyal supporters*, after controlling for the three-party regions. However, once adding the interaction term *Three-party region dummy * Density*, *Density at the cutpoints* becomes negative and significant, suggesting that two-party swing regions are getting less in subventions, while three-party swing regions are getting more (the coefficient on the interactions term is positive and significant at the 1% level). So, if there is some positive significant relation between subventions per capita and

the number of swing voters (measured by the density), it is only true for the three-party regions. However, this result is not robust as other swing proxies do not confirm it[16].

We found some evidence that subventions per capita increase with *Turnout*. The variable is positive and significant in the regression with swing count measures and marginally significant with the density measure. This finding is consistent with Castells and Sole-Olle (2005). An increase in one standard deviation in *Turnout* results in some 7% increase in per-capita subventions.

Log Price of the seat is negative and significant in the regression with the *Socialist vote share*, but becomes insignificant in the one with *Loyal supporters*. So based on these results we cannot draw a conclusion on the relation between subventions per capita and the regional electoral productivity. It might be, however, that our proxy for the electoral system is incomplete as it only indirectly measures the probability of gaining an additional seat (electoral districts do not coincide with sample units).

We did not find support for the hypothesis that political trade is conducted along party lines. Instead, *Incumbent majority in the regional government* dummy is negative and marginally significant. Regional governments where socialists were in the majority (we check both simple and absolute majority) were not able to attract more subventions to their regions. We might not find the expected relation due to the multi-party nature of the Spanish electoral system. Note that theories of party alignment between different levels of governments are developed for two-party systems, where you have the ruling party and the opposition party. In Spain, the picture is more complex, as we have at least an additional third player, the regional party. Moreover, as a result of minority government, the ruling Socialist party depended on the support of regional parties during some years. Then the prediction on who should get favours from the central incumbent becomes less clear for the Spanish case.

We also did not find support that the incumbent government rewarded its coalition partners in the parliament. *Catalonia dummy* for years 1993-1996 is insignificant across models. It would be interesting to test the next period of the minority (PP) government, when the incumbent was in the formal coalition with regional parties.

[16] We also added the interaction term Three-party*Swing count measure to check if the sign on the Counting swing voters changes, but it remains negative.

In addition, I include interaction terms between *Loyal* and *Swing* proxies and d_o, a dummy variable equal to one if we are in election year, and d_1, d_2, and d_3, dummies if we are respectively one year, two years and three years before a new election. We did not find any varying effect through the electoral cycle. *The Wald test* cannot reject the null hypothesis that effects at d_o, d_1, d_2, and d_3 are constant across the political cycle. Castells and Sole-Olle (2005) also did not find electoral cycles for loyal and swing proxies.

Conclusion

We tested partisan theories of distributive politics for the case of three party competition. We focused on the discretionary grants that are suitable for investigating vote purchasing behaviour of incumbent governments. We estimated the number of swing and loyal voters from electoral surveys. In addition, we attempted to control for the electoral system which makes some regions more productive than others in terms of votes.

The key findings are as follows. We find that political variables are significant in the allocation of state subventions, and the magnitude of the effect is comparable to that of economic variables. In particular, we find strong support for the Cox and McCubbins (1986) model, in which parties distribute transfers to loyal regions with many supporters. An increase in one standard deviation in the loyal proxies results in a 10% to 18% increase in per-capita subventions. The result is robust to inclusion of many economic controls and institutional dummies. Regions with higher number of swing voters, measured by several proxies, received disproportionately less in subventions. The evidence that transfers increase with turnout suggests how the *loyal hypothesis* might work. Spending may mobilize people to vote and it is easier to mobilize incumbents' core supporters than swing voters who are by definition unattached (Ansolabehere and Snyder, 2003).

Partisan theories assume that public expenditure helps politicians to win votes. The possible extension of this paper is to study whether it pays to pursue manipulation of grants by estimating how the share of votes for the incumbent depends on the transfers, controlling for an incumbents ideology, performance and socio-demographic characteristics of voters.

Appendix:

Data for Estimating Swing Voters

We used individual data from the CIS (Centro de Investigaciones Sociológicas) studies 2025-2041 from 1992. We used information on the self- and major parties locations on the left-right ideological dimension and on the centralist-nationalist dimension. The corresponding questions in the survey were: 1) in politics people usually use terms “the Left” and “the Right”. Please, identify yourself and parties on the scale 0-10, from Left to Right. 2) With respect to the nationalist/regionalist sentiment, please locate yourself and parties on the scale 0-10, from minimum Nationalism/Regionalism to maximum Nationalism/Regionalism.

Consistent Rankings

For two-party regions, we expect that the socialist party PSOE is located to the left of the conservative party PP, or *psoex<ppx*. After discarding missing and inconsistent observations, for two-party regions we are left with 10332 observations out of the sample of 18446 observations.

For three-party regions, we also expect that *psoex<ppx*. Location of the regional party on the left-right dimension depends on the particular party. It is centre right (*psoex<regx<ppx)* in Aragon and Catalonia, leftist in Galicia (*regx<psoex<ppx*). In Canarias and the Basque Country, the regional parties (AIC and PNV, respectively) are also centrist, that is *psoex<regx<ppx.* However, according to respondents in Canarias and Basque Country, the mean locations of PSOE and REG are not importantly different, taking into account the standard deviations (See Table A1), so we allow for the ranking *regx<psoex*, as long as PSOE and REG are not located too far (the assumed threshold is 1).

On the nationalist dimension, we always expect the regional party to be more to the right (or more nationalist), than the two country-wide parties, that is *psoey<regy* and *ppy<regy*. In terms of party platforms, PP is a more centralized than PSOE (that is PP is located to the left of PSOE). However, only in Catalonia do people place PP substantially to the left of PSOE on the nationalist dimension (See Table A2). In Galicia, Canarias and the Basque Country, mean PSOE and PP locations are very close, while in Aragon majority of respondents put PSOE to left of PP (i.e. PSOE is more centralist than PP). So we assume the rank is reasonable for Catalonia if *ppy<psoey<regy*, and for other three-party regions it is reasonable as long as *psoey<regy*, *ppy<regy* and *psoey* and *ppy* are close.

Once we account for the inconsistent rankings on both left-right and the nationalist dimensions and missing observations, we are left with 207 observations in Aragon, 113 observations in Canarias, 928 in Catalonia, 484 in Galicia, and 537 in the Basque Country.

Summary statistics of self and party locations on the left-right and nationalist dimensions for three-party regions are presented Tables A1 and A2.

Normalization

Define the normalization rule:

$$Self\_AB = \bar{A} + \frac{self - A}{B - A} \times \left(\bar{B} - \bar{A}\right), \qquad (1)$$

where A and B are either PSOE, PP or REG.

Define Strong Rank:

$$StrongRank = \min(|psoe - pp|, |reg - pp|, |psoe - reg|) > 1$$

Normalization 1:

1) if *StrongRank* and $\max(|psoe - self|, |pp - self|, |reg - self|) = |psoe - self|$,
then use *Self_PPREG*
etc…
2) if not StrongRank and $\min(|psoe - pp|, |reg - pp|, |psoe - reg|) = |psoe - pp|$,
then use *(Self_PSOEREG+Self_PPREG)/2*
etc…

Normalization 2:

1) if *StrongRank* and $\min(|psoe - self|, |pp - self|, |reg - self|) = |psoe - self|$,
then use *Self_PPREG*
etc…
2) if not StrongRank and $\min(|psoe - pp|, |reg - pp|, |psoe - reg|) = |psoe - pp|$,
then use *(Self_PSOEREG+Self_PPREG)/2*
etc…

Normalization 3:

1) if *StrongRank* and $\min(|psoe - self|, |pp - self|, |reg - self|) \neq |psoe - self|$ and $\max(|psoe - self|, |pp - self|, |reg - self|) \neq |psoe - self|$,
then use *Self_PPREG*
etc…
2) if not StrongRank and $\min(|psoe - pp|, |reg - pp|, |psoe - reg|) = |psoe - pp|$,
then use *(Self_PSOEREG+Self_PPREG)/2*
etc…

Normalization 4 (without two cases):

if ($\min(|psoe-self|,|pp-self|,|reg-self|) = |psoe-self|$ and

$\max(|psoe-self|,|pp-self|,|reg-self|) = |reg-self|$) or

($\min(|psoe-self|,|pp-self|,|reg-self|) = |reg-self|$ and

$\max(|psoe-self|,|pp-self|,|reg-self|) = |psoe-self|$)

then use *Self_PSOEREG*

Table A.1. Summary Statistics of Self and Party Locations on the Ideological Axis (X)

	Variable	Self location-X	PSOE location-X	REG location-X	PP location-X	
Aragon	Mean	4.90	4.49	6.18	7.72	
	Standard Deviation	1.87	1.72	1.66	1.71	
	Observations					327
Canarias	Mean	4.57	4.59	5.79	7.70	
	Standard Deviation	1.99	1.92	2.37	2.02	
	Observations					229
Catalonia	Mean	4.71	4.64	6.68	8.57	
	Standard Deviation	1.85	1.59	1.40	1.31	
	Observations					1156
Galicia	Mean	4.69	4.47	2.07	8.07	
	Standard Deviation	2.10	1.91	1.59	1.71	
	Observations					692
Basque Country	Mean	3.83	5.24	5.10	8.49	
	Standard Deviation	1.84	2.11	2.17	1.34	
	Observations					778

Table A2. Summary Statistics of Self and Party Locations on the Nationalist Axis (Y)

	Variable	Self location-Y	PP location-Y	PSOE location-Y	REG location-Y	
Aragon	Mean	6.04	4.20	3.72	6.92	
	Standard Deviation	2.31	2.17	2.17	2.06	
	Observations					327
Canarias	Mean	5.81	3.58	3.86	6.06	
	Standard Deviation	2.84	2.27	2.03	2.37	
	Observations					229
Catalonia	Mean	6.13	2.27	3.82	7.48	
	Standard Deviation	2.61	1.69	1.92	1.56	
	Observations					1156
Galicia	Mean	6.06	3.57	3.65	7.90	
	Standard Deviation	2.53	2.53	2.24	2.61	
	Observations					692
Basque Country	Mean	5.94	2.09	2.61	7.14	
	Standard Deviation	2.58	1.84	1.81	1.86	
	Observations					778

Table A3. Determinants of the Vote for PSOE for Two Party Regions and Three Party Regions, Multinomial Probit Estimation

Vote for PSOE (Alternative 1)	2 Party Regions	Catalonia	Aragon	Galicia	Canarias	Basque country
Distance to PSOE-X	-0.30	-0.05	-0.37	-0.41	-0.13	-1.58
	[0.02]**	[0.16]	[0.12]**	[0.13]**	[0.09]	[0.74]*
Distance to PP-X	0.33	0.8	0.49	0.29	0.33	1.33
	[0.02]**	[0.22]**	[0.11]**	[0.11]**	[0.09]**	[0.87]
Evaluation of PSOE leader	0.26	0.37	0.18	0.23	0.15	0.37
	[0.02]**	[0.11]**	[0.08]*	[0.08]**	[0.06]**	[0.30]
Evaluation of PP leader	-0.36	-0.48	-0.51	-0.28	-0.27	-0.61
	[0.02]**	[0.13]**	[0.11]**	[0.08]**	[0.06]**	[0.47]
Performance of PSOE	-0.31	-0.08	-0.19	-0.10	-0.29	-0.32
	[0.06]**	[0.34]	[0.23]	[0.30]	[0.24]	[0.88]
Age	-0.01	-0.03	0.02	-0.02	-0.01	
	[0.00]**	[0.02]	[0.01]	[0.01]	[0.01]	
Self-reported class	0.22	0.21		0.38		-1.98
	[0.06]**	[0.38]		[0.26]		[1.80]
Income	-0.13	-0.16		0.03		-0.47
	[0.04]**	[0.19]		[0.12]		[0.41]
Religion	0.17	-0.18	0.35	0.38	0.15	0.49
	[0.04]**	[0.20]	[0.20]	[0.20]	[0.15]	[0.61]
Distance to PSOE-Y		0.02		-0.22		
		[0.14]		[0.10]*		
Distance to PP-Y		0.14		0.22		
		[0.14]		[0.10]*		
Language		0.88		0.13		0.02
		[0.38]*		[0.31]		[0.65]
% of Correct prediction	0.80	0.75	0.73	0.79	0.74	0.75
Observations	5037	470	292	313	272	291

Note: Standard errors in brackets; * - significant at 1% level, ** - significant at 5% level.

Reference:

Alesina, A., Roubini, N., Cohen, G.D., 1997. Political Cycles and the Macro Economy. Cambridge: MIT Press.

Ansolabehere, S., Snyder, J.M., 2003. Party control of state government and the distribution of public expenditures. MIT Department of Economics Working Paper 03-28.

Arellano, M., Bond, S., 1991. Some tests of specification for panel data: Monte Carlo evidence and an application to employment equation. The Review of Economic Studies 58, 277-297.

Cambell, A., Converse, P.E., Miller, W.E., Stokes, D.E., 1960. The American Voter. New York: Wiley.

Case, A., 2001. Election goals and income redistribution: recent evidence from Albania. European Economic Review 45, 405-423.

Castells, A., Sole-Olle, A., 2005. The regional allocation of infrastructure investment: the role of equity, efficiency and political factors. European Economic Review 49 (5), 1165-1205.

Colomer, J., 2003. Political Institutions. Oxford U.P.

Cox, G., McCubbins, M., 1986. Electoral politics as a redistributive game. Journal of Politics 48, 370-389.

Dahlberg, M., Johansson, E., 2002. On the vote-purchasing behavior of incumbent governments. American Political Science Review 96 (1), 27-40.

Dasgupta, S., Dhillon, A., Bhaskar D., 2001. Electoral goals and centre-state transfers in India. Unpublished Paper, 2001.

Dixit, A., Londregan, J, 1996. The determinants of success of special interests in redistributive politics. Journal of Politics 58 (4), 1132-1155.

Downs, A., 1957. An Economic Theory of Democracy. New York: Harper and Row, 1957.

Esteller-Moré, A., 2005. Is there a connection between the tax administration and the political power? International Tax and Public Finance 12 (5), 639-663.

Ferejohn, J.A., 1974. Pork Barrel Politics: Rivers and Harbors Legislation, 1947-1968. Stanford: Stanford University Press.

Fiorina, M.P., 1981. Retrospective Voting in American National Elections. New Haven: Yale University Press.

Garcia-Milà, T., McGuire, T, 2007. Fiscal decentralization in Spain: an asymmetric transition to democracy. In: Bird, R.M., Ebel, R.D. (Eds.). Fiscal Fragmentation in Decentralized Countries; Subsidiarity, Solidarity and Asymmetry, Cheltenham, UK: Edward Elgar.

Johansson, E., 2003 Intergovernmental grants as a tactical instrument: empirical evidence from Swedish municipalities. Journal of Public Economics 87 (5-6), 883-915.

Johnston, R.J., 1979. Political, Electoral, and Spatial Systems. Oxford: Oxford University Press.

Hillygus, D.S., Jackman, S., 2003. Voter decision making in election 2000: campaign effects, partisan activation, and the Clinton legacy. American Journal of Political Science 47 (4), 583-596.

Kahneman, D., Tversky, A., 1979. Prospect theory: an analysis of decision under risk. Econometrica 47 (2), 263-292.

Levitt, S.D., Potterba, J.M., 1999. Congressional distributive politics and state economic performance. Public Choice 99 (1-2), 185-216.

Lindbeck, A. and J. W. Weibull. "Balanced-Budget Redistribution as the Outcome of Political Competition." *Public Choice,* 1987, 52, pp. 273-297.

Linz, Juan J. and Jose R. Montero. "The Party Systems of Spain: Old Cleavages and New Challenges." *Working Paper 1999/138, Juan March Institute,* 1999.

Molas, Isidre and Oriol Bartomeus. "Els Espais De Frontera Entre Els Electorats. Estructura De La Competéncia Política a Catalunya (II)." *WP Institut De Ciéncies Polítiques y Socials,* 1999.

Monasterio, C. and Suarez, J. *Manual de hacienda autonomica y local.* Barcelona: Ariel, 1998.

Musgrave, Richard A. and Musgrave, Peggy B. *Public finance in theory and practice.* New York: McGraw-Hill, 1989.

Niemi, Richard G. and Weisberg, Herbert F. *Controversies in voting behavior.* Washington D.C.: Congressional Quarterly Press, 1993.

Nohlen, Dieter and Rainer-Olaf Schultze. "Los Efectos Del Sistema Electoral Español Sobre La Relación Entre Sufragios y Escaños. Un Estudio Con Motivo De Las Elecciones a Cortes De 1982." *Revista Española De Investigaciones Sociológicas,* 1985, 30, pp. 179-200.

Nordhaus, William. "The Political Business Cycle." *Review of Economic Studies,* 1975, 42, pp. 169-190.

Pérez-Nievas, Santiago and Marta Fraile. "Is the Nationalist Vote really Nationalist? Dual Voting in Catalonia 1980-1999." *Juan March Institute Working Paper 2000/147,* 2000,

Rodden, Jonathan and Wilkinson, Steven. *The Shifting Political Economy of Redistribution in the Indian Federation.* Unpublished Paper, 2004.

Schady, Norbert R. "The Political Economy of Expenditures by the Peruvian Social Fund (FONCODES), 1991-1995." *The American Political Science Review,* 2000, 94 (2), pp. 289-304.

Snyder, James M. "Election Goal and the Allocation of Campaign Resources." *Econometrica,* 1989, 57 (3), pp. 637-660.

Snyder, James M. "Resource Allocation in Multiparty Elections." *American Journal of Political Science,* 1990, 34 (1), pp. 59-73.

Stromberg, D. *Radio´s Impact on Public Spending.* Unpublished Paper, 2001.

Testa, C., Larcinse, V., Rizzo L., 2006. Allocating the U.S. Federal Budget to the States: The Impact of the President The Journal of Politics 68 (2) , 447–456.

Torcal, M. and P. Chhiber. "Elites, Cleavages y Sistema De Partidos En Una Democracía Consolidada: España (1986-1992)." *Revista Española De Investigaciones Sociológicas,* 1995, (69), pp. 7-38.

Torcal, M. and L. Medina. "Ideología y Voto En España 1979-2000: Los Procesos De Reconstrucción Racional De La Identificación Ideológica." *Revista Española De Ciencia Política,* 2000, (6), pp. 57-96.

Torcal, Mariano, Richard Gunther and José R. Montero. "Anti-Party Sentiments in Southern Europe." *Juan March Institute Working Paper 2001/170,* 2001.

Tufte, Edward R. *Political control of the economy.* Princeton, N.J.: Princeton University Press, 1978.

Wooldridge, Jeffrey M. *Econometric analysis of cross-section and panel data.* Cambridge, Massachusetts: MIT Press, 2002.