

# Political Economy of Intergovernmental Grants

Elena Jarocińska  
Universitat Pompeu Fabra  
Doctoral Thesis

Advisor: Robin Hogarth  
Co-Advisor: Teresa Garcia-Milà

June, 2006

Keywords: Distributive politics, intergovernmental grants, discretionary grants, Russia, Spain, swing voters, loyal voters, voting behaviour, multiparty electoral systems, bi-dimensional political preferences

Dipòsit legal: B.54190-2006

ISBN: 978-84-690-3510-8

# Contents

ACKNOWLEDGEMENTS .....	4
FOREWORD.....	5
<b>1 ARE INTERGOVERNMENTAL GRANTS TACTICAL? THE EVIDENCE FROM RUSSIA</b> .....	<b>7</b>
1.1 INTRODUCTION.....	8
1.2 FINANCIAL FLOWS BETWEEN THE FEDERAL CENTER AND REGIONS .....	9
1.3 TACTICAL GRANTS: FORMULATING HYPOTHESES .....	13
1.4 EMPIRICAL ANALYSIS .....	17
1.4.1 <i>Empirical Methodology</i> .....	17
1.4.2 <i>Data and Variable Description</i> .....	18
1.4.3 <i>Data Analysis</i> .....	21
1.5 RESULTS .....	21
1.5.1 1995 - 1999.....	21
1.5.2 2000 - 2001.....	29
1.6 CONCLUSIONS.....	31
REFERENCES.....	32
<b>2 MEASURING SWING VOTERS.....</b>	<b>35</b>
2.1 INTRODUCTION.....	36
2.2 DATA .....	39
2.3 DENSITY MEASURE.....	40
2.3.1 <i>Assumptions</i> .....	40
2.3.2 <i>Data Preparation</i> .....	40
2.3.3 <i>Normalization</i> .....	43
2.3.4 <i>Estimation</i> .....	46
2.3.5 <i>Description of Bivariate Densities</i> .....	47
2.4 COUNT SWING MEASURE .....	48
2.4.1 <i>Assumptions</i> .....	48
2.4.2 <i>Estimation</i> .....	48
2.5 CONCLUSIONS .....	52
APPENDIX 2.A NORMALIZATION .....	53
APPENDIX 2.B DETERMINANTS OF THE VOTE FOR PSOE, MULTINOMIAL PROBIT ESTIMATION .....	55
FIGURES .....	56
REFERENCES.....	62
<b>3 TESTING MODELS OF DISTRIBUTIVE POLITICS: THE CASE OF SPAIN .....</b>	<b>66</b>
3.1 INTRODUCTION.....	67
3.2 THEORIES AND EVIDENCE ON DISTRIBUTIVE POLITICS: FORMULATING HYPOTHESES .....	69
3.3 THE DATA.....	73
3.4 ANALYSIS .....	74
3.4.1 <i>Subventions</i> .....	74
3.4.1.1 <i>Specification</i> .....	74
3.4.1.2 <i>Econometric Issues</i> .....	78
3.4.1.3 <i>Results</i> .....	79
3.4.2 <i>Investment Programs</i> .....	82
3.4.2.1 <i>Specification</i> .....	82
3.4.2.2 <i>Results</i> .....	83
3.5 CONCLUSIONS .....	84
TABLES.....	85
REFERENCES.....	89

## **Acknowledgements**

Above all, I would like to thank my advisors Robin Hogarth and Teresa Garcia-Milà for their invaluable support. Each meeting with them was encouraging and provided me with knowledgeable guidance. I benefited a lot from comments and discussions with Josep Colomer, Núria Bosch, Clara Riba, Ekaterina Zhuravskaya, Mariano Torcal, Carlos Boix, Marc LeMenestrel, Irina Cojuharenco and participants of the seminars at the Universitat Pompeu Fabra. I am grateful to the CEFIR, Moscow where a part of this work took place, for their hospitality and professional environment. Financial support from the Spanish Ministry of Science and Technology (FPI) is gratefully acknowledged. Finally, thanks to my husband, daughter, parents and parents-in law.

Barcelona, June 2006

Elena Jarocińska

## Foreword

It is traditionally held that equity and efficiency considerations are used when designing system of intergovernmental transfers. The system might redistribute wealth from rich to poor regions to provide some standard level of public services. Or it might take into account external benefits some regional productions generate (e.g. building a road), and compensate a region with a price-reduction grant. The political economy view is that grants are tools used by public officials to achieve their political goals. The recent vast literature has found solid support for the political economy view on transfer allocation. However, there is still little consensus in the empirical research about the strategy an incumbent should follow with regard to the geographical distribution of expenditures.

Two papers in this dissertation – the first and the third - provide new empirical evidence on political determinants of intergovernmental transfers for the case of Russia and Spain, and the second paper develops novel methodological tools for analyzing political systems where voters can be classified on two “ideological” dimensions.

The interest of the paper on Russia is that it studies political economy of transfers in immature democracies. This paper contributes to the discussion of tactical transfers in Russia in that it first analyses panel data, and second uses a comprehensive measure of expenditure ‘needs’. Panel data provide more observations and allow the researcher to control for individual-specific effects. By using a comprehensive measure of normative ‘needs’, we are able to get better estimates of political factors.

Recent theoretical models proposed testable empirical predictions as to which group of voters might benefit from distributive politics. One of the main predictions is that grants should be allocated to swing states. However, what is missing in the literature is the way swing voters are to be measured if more than two parties compete. The second paper makes a methodological contribution in this respect. In particular, it develops two

measures that take into account the bi-dimensionality of the Spanish politics using individual data from CIS surveys. The first measure accounts for swing voters on both the traditional left-right dimension and the centralist-nationalist dimension by estimating bivariate densities for three-party regions. The second measure uses the multinomial probit technique and includes additional controls for the nationalist sentiment. Analysis of swing voters also adds to the research on voting behavior.

Measures developed in the second paper allow us to test models of distributive politics for multiparty systems. The third paper contains new findings with respect to the beneficiaries of federal grants for the case of Spain.

A further direction of this work is to link theories of distributive politics with institutional structures in democracies. For instance, partisan models postulating a strategic unitary incumbent might be more appropriate in British-style Westminster systems or parliamentary systems with strong parties, while congressional theories based on legislative bargaining might explain cross-region variation in presidential systems with weak party discipline or in parliamentary systems with frequent coalition governments. Finding regularities of this sort can illuminate empirical researchers with predictions to test and lead to generalization of results of particular case studies.

# **1 Are Intergovernmental Grants Tactical? The Evidence from Russia**

## *Abstract*

Previous research on the political economy of fiscal federalism in Russia has suggested that transfers were used by federal politicians to achieve electoral goals. This paper analyses relations between transfers and federal elections outcomes, using panel data for 1995-2001. For years 1995-1999, analysis suggests that if autonomous districts are excluded and region-specific effects are controlled for, the effect of elections on transfers disappears. This result is robust across specifications. In addition, we find some evidence that more powerful regions (where governors were elected) received transfers above their 'needs'. 2000-2001 shows a distinct pattern, with election variables showing no effect on net transfers. It appears that in the nineties transfers were used selectively by the incumbent government to enhance its reelection probabilities, while by the end of the century this mechanism was no longer in use due to the increased popularity of the new president.

## 1.1 Introduction

That tactical considerations enter into redistribution is evidenced by numerous studies showing strong relations between grants and political factors such as voting patterns, timing of elections, geographical location, lobbying activity, etc. Previous literature on tactical grants has concentrated mainly on the American case. A recent trend is to offer a more complete picture of distributive politics by looking at Sweden (Dahleberg and Johansson, 2002; Johansson, 2003), Japan (Horiuchi, 2003), Albania (Case, 2000), and Russia (Treisman, 1996, 1998a and 1998b; Popov, 2004).

Two main empirical studies on Russia showed the importance of electoral outcomes on the allocation of intergovernmental grants. Daniel Treisman (1996, 1998a and 1998b) found that receipts by regions of federal transfers in 1992-1996 were a positive function of anti-incumbent voting, and also of protest actions by the region – sovereignty declarations, and strikes. On the contrary, the study by Vladimir Popov (2004) found that during 1995-2001 actual net transfers were positively related to the pro-Yeltsin vote and pro-democratic results of the parliamentary elections. What could explain these different findings: different time horizons, inconsistency of estimates or simply distinct data sources?

This paper contributes to the discussion of tactical transfers in Russia in that it first, analyses panel data and second, uses a comprehensive measure of expenditure ‘needs’. Panel data provide more observations and allow us to control for individual-specific effects. In a country like Russia, it is likely that some regional-specific characteristics influence transfer allocation. If correlated with explanatory variables, these regional-specific effects might cause bias in interpreting results in previous research. To control for regional ‘needs’ in transfers, we use estimates of expenditure need and tax potential by the Russian Ministry of Finance and the Institute for the Economy in Transition. By using a comprehensive measure of normative ‘needs’, we are able to get better estimates of political factors.

Two hypotheses are tested. First, the *electoral hypothesis* suggests that the incumbent federal government uses transfers to increase its reelection chances. Second, the



*grantsmanship hypothesis* advocates the idea that powerful regions (i.e., those able to influence central government decisions) receive transfers above their objective ‘needs’.

For the years 1995-1999, we find only weak confirmation of the electoral hypothesis. If autonomous districts are excluded and region-specific effects are controlled for, the effect of votes on transfers disappears. This result is robust across specifications. Only in 1998 is some evidence found that regions with pro-incumbent votes received higher transfers. This might indicate that if political cycles exist, they are of short-lived nature, confirming findings from Ahmedov and Zhuravskaya (2004). In addition, we find some evidence that more powerful regions received transfers above their ‘needs’ (regions with elected governors were assumed to be more powerful). For 2000-2001, votes have no effect on transfers. This finding is consistent with Popov (2004) and Koidze (2005). It appears that by the end of the century, the popular incumbent no longer needed transfers as a mechanism for improving reelection chances.

The paper is organised as follows. First, we briefly explain the system of fiscal federalism in Russia. Second, based on existing theory and the Russian political reality, we formulate hypotheses of tactical transfers. Third, a section on empirical analysis includes formulation of the methodology, description of data and variables, and data analysis. Next we present results. The last part concludes.

## **1.2 Financial Flows between the Federal Center and Regions**

In this section I will briefly discuss the system of fiscal federalism in Russia.

There are three levels of government in Russia: the federal government, the regional government and municipalities. Grants from the federal center are an important revenue source for regional governments. Federal transfers account for about 15 percent of the aggregate regional revenues (Lavrov et al, 2001). However, the proportion grows to almost 30 percent, if financial aid from extra budgetary sources is included (OECD, 2002, Table 4.2). Large regional differences are observed, *e.g.* for Moscow federal

transfers amounted to 1.4% and for Ust-Ordynski Buriatski autonomous district – to 86.7% (OECD, 2002, Table 4.3).

All 89 members of the Russian Federation receive one or another form of financial aid (Sinelnikov et al, 2001). Federal financial aid consists of subsidies, subventions, transfers from the Federal Fund for Regional Support (FFPR) and other (See Table 1). Subsidies are aimed at financing federal programmes; subventions consist of transfers to the city of Moscow to compensate the capital for provision of public services; and transfers from FFPR are an equalizing grant, which supports regions with small tax capacity and large costs.

**Table 1. Structure of Federal financial aid in 1992-2001 (% GDP)**

	1992	1993	1994	1995	1996	1997	1998	1999	2000*	2001**
Subsidies		0.02	0.09	0.06	0.09	0.13	0.10	0.06	0.15	0.14
Subventions	0.79	0.69	0.42	0.12	0.12	0.09	0.02	0.20	0.03	0.11
Transfers from FFFA			0.36	1.17	1.04	1.22	1.12	0.98	0.95	1.19
Transfers from Compensation fund										0.54
Transfers from Regional Development fund										0.04
Transfers from Regional Budget Development fund										0.01
Mutual off-set funds	0.61	1.95	2.54	0.42	0.81	0.43	0.36	0.14	0.16	
Budget loans less repayment:	0.09	0.03	0.02	0.04	0.23	0.64	-0.03	-0.28	0.01	
Other kinds of financial aid										0.37
<b>Total: funds received</b>	<b>1.49</b>	<b>2.70</b>	<b>3.4</b>	<b>1.8</b>	<b>2.3</b>	<b>2.5</b>	<b>1.60</b>	<b>1.37</b>	<b>1.30</b>	<b>2.40</b>
* data for Jan. – Sept. 2000										
** plan										

Source: Sinelnikov et al 2001, p.45.

Transfers from FFPR have become the main part of federal financial aid since 1995 with shares growing up to some 70 percent in 2000 (See Sinelnikov et al, 2001). According to the Budget law of 1994, one part of the FFPR was distributed among regions with budget revenues lower than the country average ('needy' regions) and the other part supported regions where budget revenues were insufficient to cover regional expenditures (very 'needy' regions) (Gaidar et al, 1996). The procedure did not take into account regional

price differences with the consequences that southern regions received relatively higher transfers than their northern counterparts. A more important shortcoming was however that amounts of federal transfers were determined by forecasts of revenues and expenditures agreed between the Ministry of Finance and regional authorities. This was accompanied by many adjustments and lobbying activity of the regions during parliamentary discussions of the Federal Budget Law. No estimates of potential taxes and expenditure needs were available until 1998-1999.

With a reform of 1999-2001, estimates of potential budget revenues and regional expenditure needs have been introduced. For the year 2000 estimates of tax potential used country average share of taxes in the Gross Regional Product (Ministry of Finance, 2002). Estimates of expenditure need included the minimum subsistence level and other indicators to reflect differences in prices of governmental services per capita across regions. The reformed system of financial aid to regions also includes a new transfer fund – Compensation Fund. It is designed to finance “federal mandates”, i.e. responsibilities given by the centre to regional governments<sup>1</sup>. The money is distributed across all subjects of the RF, with two federal mandates being executed: children and handicap benefits. Two other funds were created within the Federal budget – the Regional Development Fund (support of investments into public infrastructure) and the Regional Budget Development Fund (support of the budgetary reforms, on a tender basis).

In the 90-s, besides regular financial aid, when the allocation was fixed by the Federal Budget law, irregular financial aid was common. Irregular financial aid included funds allocated through mutual settlements, budget loans (which are often not repaid), and so on. Irregular financing depended to a greater extent on the informal agreements between the federal center and regions and did not take into account objective needs of the region.

Apart from grants from the federal center, another important source of regional budgets is shares in federal taxes. These shares (mainly, shares in the VAT tax) differed a lot across regions (e.g. in 1995 regions often retained some 60 percent of federal taxes, while in some republics e.g. Tatarstan, Bashkortostan shares were up to 94 percent). Those regions

---

<sup>1</sup> It also includes so called “nonfinancing federal mandates”, when the center delegates responsibilities to regions without corresponding financing. On average, only 30 percent of federal mandates are financed by regions (Lavrov et al, 2001).

with high shares normally had mutual agreements with the federal state, which allowed them to retain some of the VAT tax in exchange for the financing of federal programmes. For instance, Yakutia send almost no money to the federal budget as a result of the agreement of 1992-1993 (Gaidar et al, 1996). Moreover, remitted taxes have been changing across years, e.g. Karelia's share in federal taxes decreased from 95% in 1994 to 67% in 1995, that of Tatarstan from 84% to 77% (Gaidar et al, 1996). It is likely that the changes were a result of political considerations rather than economic necessity.

Thus, in order to analyse correctly financial flows between the federal center and regions, one has to look at net transfers, the difference between transfers sent to regions and taxes remitted to the center. This is the measure used in Treisman (1996, 1998a, and 1998b). It is also important to note that ideally net transfers should also include federal expenditures in regions (e.g. payroll of militia, investment projects, construction, etc.). However, these data, especially for the period studied, are unavailable.

An average Russian region receives a negative net transfer (remitted taxes represent some 8 percent of GDP, while total transfers – some 3 percent). Average net transfers per capita of the top ten and bottom ten Russian regions are presented in Table 2.

**Table 2. Average Net Transfers per Capita of Top Ten and Bottom Ten Russian Regions, 1994-2001, in real terms\***

<b>TOP TEN</b>		<b>BOTTOM TEN</b>	
Koryak AO**	7.21	Moskow oblast	-1.36
Evenki AO	4.99	Perm oblast	-1.37
Chukotka AO	4.92	St. Petersburg city	-1.48
Tuva republic	1.76	Komi republic	-1.53
Magadan oblast	1.74	Taimyr AO	-1.91
Ust-Ordyn Buryat AO	1.16	Samara oblast	-1.96
Dagestan republic	0.95	Nenets AO	-2.05
Kamchatka oblast	0.93	Moscow city	-5.63
Evrei autonomous oblast	0.86	Yamalo-Nenets AO	-10.53
Komi-Permyak AO	0.82	Khanty-Mansi AO	-11.56

Source: State Tax Service and own calculations.

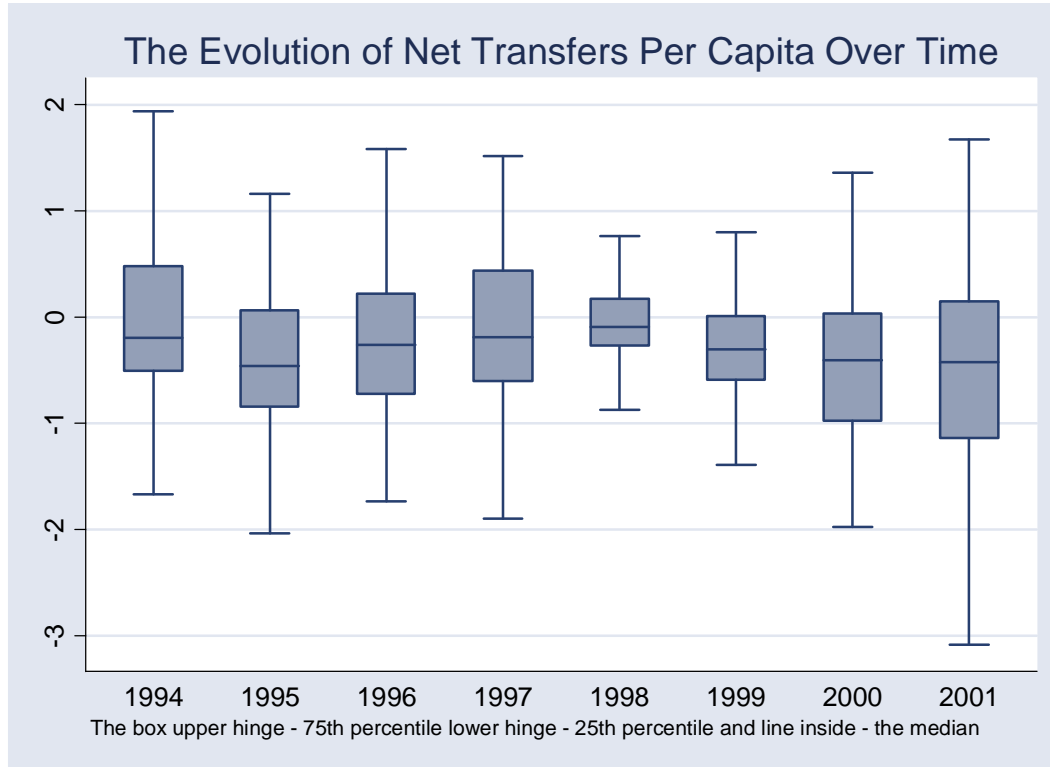
\*Here and below the unit is 100 thousand rubles from 1993, at the exchange rate of 576 rubles per USD dollar.

\*\*Autonomous districts ('okrugs').

Big differences are observed across regions. Of the top ten recipients of net aid, 5 regions have the status of autonomous districts. Regions-donors include two main Russian oil regions – Khanty-Mansiisk and Yamalo-Nenets, a main metallurgical region – Taimyr,

the Russian capital Moscow and the second Russian city St.Petersburg. The evolution of net transfers over time can be seen from the Graph 1.

**Graph 1. The Evolution of Net Transfers per Capita Over Time**



Source: State Tax Service

It is interesting to note, that up to 1998 net transfers were increasing, while since 1999 a decreasing trend is observed. This evolution might reflect changes in the balance of power between the federal center and regions. With elections of governors in 1996-97, regions have improved their bargaining position. This has resulted in lower taxes remitted to the center. 1999 saw Putin coming to power and an overall trend toward centralization with regions receiving less from the federal budget.

### 1.3 Tactical Grants: Formulating Hypotheses

The literature suggests several findings concerning politics in the allocation of intergovernmental transfers. Studies have been supportive of an *electoral hypothesis* in

which politicians distribute transfers so as to increase the probability of winning elections. This may relate to presidential elections as in Johnston (1979) and Cingranelli (1983) or to the pork barrel politics of congressmen as in Ferejohn (1974). Johnston (1979) shows that quantity of federal grants to US state governments increases before presidential elections and administrations may spend more on marginal constituencies (i.e. constituencies with a big number of swing voters) to benefit those voters. Ferejohn (1974) in his famous study of pork barrel politics of rivers and harbors concludes that influential members of the American Congress secured more projects for their constituencies than did their peers in the Congress to increase their chances in regional elections. The prediction from Cox and McCubbins's (1986) model is that the incumbent government purchases votes by investing in regions where it already has high support.

Empirical studies on Russia confirm the importance of the *electoral hypothesis*, while suggesting two opposite findings: transfers were higher in the protest regions (Treisman, 1996 and 1998), and transfers increase with the pro-incumbent vote (Popov, 2004). The measure usually used to test the electoral hypothesis is the percentage vote in the preceding elections. One should note that in Russia in the nineties results in federal elections were strongly positively correlated. For instance, correlations of the pro-Yeltsin vote in the second round of the 1996 elections and the vote for democratic vs. leftist parties in the parliamentary elections of 1993, 1995 and 1999 are between 0.78 and 0.87 (Popov, 2004). Thus, stability of electoral outcomes allowed federal politicians to use information from previous elections in grant allocation. We use this fact in the construction of our explanatory variables: for the time period of 1995-1999, we use election results in the 1995 Parliamentary election and, alternatively, results in the 1996 Presidential election.

The focus of a Downsian politician, who only cares about winning election in a democratic state is voters (Downs, 1957). A different political economy tradition examines the logic of interest-group competition (for instance, Grossman and Helpman, 1996). As Shleifer and Treisman (2000) state concerning the Russian case, "in a fluid political setting, where the implementation of policies is important and as difficult as their enactment, and where enactment relies on agreement among powerful political

groups rather than a vote, elections are only one of many arenas in which interest groups compete”.

In the Russian system of federal finance two main competing groups are the central government and regional governments. Regional governments execute their power through leverage over regional tax-collection offices, representation in parliament and threats of separatism (Shleifer and Treisman, 2000). A particular role belongs to governors (regional government heads), who often determine regional relations with the federal center (Petrov, 2000). 1996-1997 saw regional elections in almost all Russian regions (before in half of the regions governors were nominated by the President). Elections, together with more autonomy through bilateral agreements, resulted in increased power of regional governments and a more active role in fiscal federalism.

The idea that recipients might have differential capacity to secure transfers is expressed by the *grantsmanship hypothesis* (Stein, 1981). The study of US federal grants for Community and Economic Development confirms that indicators such as prior experience in a particular program, whether or not a city had a Washington lobbyist, and the number of grant applications submitted show a strong positive association with the amount of funds awarded (Rich, 1989). According to Pfeffer and Salancik’s study of the university budget (1974a and 1974b), it is powerful departments who got more university money. Departmental *power* is defined as ability of a particular department to influence decisions on the distribution of money.

According to the *grantsmanship hypothesis*, powerful (influential) regions will receive higher transfers. We expect powerful regions to have popular governors with long tenure, who were democratically elected with high level of support at the last regional election. Governors with a strong popular base in the regions are likely to have a better bargaining position with the federal government. Tenure is often used in the literature as a proxy for power (see e.g. Horiuchi, 2003). An indirect measure of regional bargaining power might be the relationship of governors and the federal center. We use two indices independently constructed by the MFK Renaissance and Urban institute from Ponomareva and Zhuravskaya (2004). We expect regions that have conflictual relations with the center to have higher bargaining power.

Besides electoral goals, the pattern of transfers might reflect other priorities of central policy makers, i.e. to support economic reform, to support particular economic sectors or to weaken ethnic tensions. We include a variable for ethnic-territorial conflicts to control for the last priority. Russia has inherited a complicated administrative system<sup>2</sup>. Historically, administrative units used to have different rights. Regions with republic status used to have more developed institutions of self-government along with various tax benefits, compared to regions with provinces or territory status. Thus, as the *grantsmanship model* might suggest, the former will be more capable of seeking and receiving federal assistance than the latter. Although differences were formally abolished by the current legislation, this still might have an effect on transfer allocation (See, for instance, Christenko 2001). During the period studied, republics transferred lower shares in federal taxes than other regions (Gaidar et al, 1996). We also control for population in the region, as it might be the case that big regions have better bargaining positions with the federal center.

To summarise the above discussion, we are going to test the following hypothesis:

1. Electoral Hypothesis (EH): The incumbent government uses intergovernmental grants to increase its reelection probabilities.

If EH is true, we expect to observe a significant relation between transfers and election outcomes. The sign of this relationship might be positive - confirmation of Popov's (2004) finding; or negative - confirmation of Treisman's (1996 and 1998) result.

2. Grantsmanship Hypothesis (GH): powerful regions receive transfers above their objective 'needs'

GH predicts that regions with influential governors and who have conflictual relations with the federal authorities will use their power to receive higher grants. In addition, we expect big regions to have better bargaining position with the federal center.

---

<sup>2</sup>89 administrative regions of Russian Federation include twenty-one republics, forty-nine provinces ('oblasts'), six territories ('krais'), eleven autonomous districts ('okrugs') and two cities, with Moscow and St. Petersburg having the latter status.



## 1.4 Empirical Analysis

### 1.4.1 Empirical Methodology

We want to explain allocation of net transfers across regions. Net transfers are total transfers sent to the region net of taxes remitted to the center. Total transfers include transfers from the FFPR and other aid such as subsidies, subventions, mutual off-set funds, etc. (See Section 2 for a detailed description of federal financial aid).

To test the hypothesis that transfers are tactical we have to take into account regional ‘need’ for a transfer. Otherwise, political factors might be overestimated<sup>3</sup>. The underlying logic of the ‘need’ criteria is that it takes into account regional ‘need’ in public expenditure and then adjusts it with the taxes that can pay for it. More specifically, we define the ‘need’ as a difference between normative measures of regional expenditures and revenues – expenditure need and tax potential. The expenditure need reflects regional differences in costs and demands in public services depending on population structure, climate conditions, and so on. The tax potential estimates the regional ability to raise taxes, given the tax base and average tax rates. The ‘need’ is an ideal transfer, which equalizes the provision of public goods across regions<sup>4</sup>.

Our approach is close to Sinelnikov et al (2001) in that it also explains transfers as the gap between regional expenditures and revenues. That is how transfers were distributed in Russia, especially in the 90-s. In addition to the normative measures, Sinelnikov et al (2001) also use *actual* expenditure and revenues as their goal is to explain actual allocation of transfers. Our research objective is different in that we need the *normative* deficit gap to be able to control for an ‘ideal’ transfer.

An alternative way to control for regional ‘need’ is to use various proxies such as demographic structure of population, social infrastructure development, income per capita, etc. For instance, this approach is used in Treisman (1996, 1998a and 1998b). In

---

<sup>3</sup> For a relevant discussion, see (Johansson and Dahlberg, 2002).

<sup>4</sup> Note that although tax potential estimates total regional ability in raising taxes, need variable includes only taxes remained as taxes remitted to the federal budget are canceled out on the left and right handside of the equation:  $\text{Transfer-Taxes to fed.budget}=\text{Expenditure}-(\text{Taxes to fed.budget}+\text{Taxes remained})$ .

our view, if comprehensive normative estimates of ‘need’ are available, it is more efficient to use those than indirect proxies.

So, we estimate the following regression model:

$$y_i = \alpha(\text{need}_i) + \beta(\text{electoral}_i) + \gamma(\text{power}_i) + \text{controls}_i + \varepsilon_i, \quad (1)$$

Where

$y_i$  – Net transfer for region  $i$  ( $i=1\dots 88$ );

$\alpha(\text{need}_i)$  - ‘Need’ for a transfer of region  $i$ ;

$\beta(\text{electoral}_i)$  – Electoral variables of region  $i$ ;

$\gamma(\text{power}_i)$  - Political indices of region  $i$ ;

$\text{controls}_i$  - control variables for region  $i$ ;

$\varepsilon_i$  - Error term,  $\varepsilon_i \sim (0, \delta^2)$  and  $E(\varepsilon_i / x_i) = 0$ .

We expect  $\alpha > 0$  (transfer is a positive function of regional ‘needs’),  $\beta > 0$  (confirmation of Popov’s (2004) finding) or  $\beta < 0$  (confirmation of Treisman’s result (1996 and 1998)), and  $\gamma > 0$  (according to the *grantsmanship* hypothesis). Once controlled for the regional needs in a transfer, we want to test what political variables are significant and have expected signs according to the EH and the GH.

## 1.4.2 Data and Variable Description

Data on total transfers and taxes remitted to the center for 1995-2001 come from the State Tax Service (STS). ‘Need’ variables are from the Ministry of Finance (Minfin, 2001) and the Institute for the Economy in Transition, IET (Kadochnikov et al, 2001). IET’s estimates of tax potential are available for 88 regions (excluding the Chechen republic) while IET’s expenditure needs are available only for 77 regions (among the missing are 8 Autonomous districts). Vote casts for Yeltsin in the presidential election of 1996 and for Putin in the election of 2000 are from the All Russian Central Election Committee (VCIK). Various political indices were constructed by the MFK Renaissance and the Urban Institute for 1997 and 1998 except few data on elected/nominated governors and governors’ political affiliation, which are available for the years 1991-99.

Data for population is from the Goskomstat (Official Russia's Statistical Agency).

Summary statistics of the variables used in the analysis are presented in Table 3.

**Table 3. Summary Statistics, years 1995-2001**

Variable description	Number of Observations	Mean	Std. Dev.	Min	Max
Net transfer	703	-0.41	3.02	-37.93	19.01
Total transfer	704	0.80	1.59	0.00	19.76
Taxes remitted	703	1.21	2.65	-10.94	40.92
Need' official	704	-5.09	6.85	-48.54	5.77
Need', IET	616	-0.45	0.98	-5.82	1.12
Parliament Election Score, 95	616	2.38	0.40	1.70	3.71
Vote cast for Yeltsin, 96	704	52.98	12.29	31.82	79.80
Vote cast for Putin, 00	176	54.57	9.87	25.01	85.42
Leader score	156	61.73	22.81	20.00	100.00
Support of the governor	156	3.63	1.74	1.00	5.00
Elected governor dummy	440	0.72	0.45	0.00	1.00
Governor's party affiliation	440	0.92	0.27	0.00	1.00
Governor's tenure	156	2.88	2.11	0.00	6.00
MFK Renaissance rating of tensions	156	2.14	0.82	1.00	3.00
Urban Institute index of relations	156	3.31	1.44	1.00	5.00
Ethnic-territorial conflicts	704	94.55	14.06	40.00	100.00
Population, thousand	704	1664.49	1500.32	18.00	8793.00
Territory ('krai) dummy	704	0.07	0.25	0.00	1.00
Province ('oblast') dummy	704	0.57	0.50	0.00	1.00
Autonomous district ('okrug') dummy	704	0.11	0.32	0.00	1.00
City dummy	704	0.02	0.15	0.00	1.00

Note: transfers, taxes and 'needs' are in real terms, per capita; here and below the unit is 100 thousand rubles from 1993, at the exchange rate of 576 rubles per USD dollar.

The 'Need' variable is the difference between expenditure need and tax potential.

Official estimates of tax potential take into account regional differences in Gross Regional Product (or Value Added), adjusted for the industrial structure (oil and gas industries generate more tax revenues than agriculture). Official expenditure need is calculated for all major categories of government spending – housing, education, health care, etc, - and includes cost of living (subsistence minimum), indices of infrastructure development, demographic structure, climate conditions and many others.

The main difference between normatives of the Minfin and the IET is that Minfin uses various exogenously given coefficients and indices, while IET estimates them with econometric methods. IET's tax potential was obtained empirically by aggregating tax bases of different taxes in Kadochnikov et al (2001), the so called method of representative tax system<sup>5</sup>. The idea is to approximate estimates of tax revenues by the actual or (if not available) theoretical tax base of each tax *i.e.* VAT, income tax, profit tax, etc. IET's expenditure needs represent the sum of theoretical expenditures of regional budgets by items. It has been estimated taking into account regional budgets incomes and some factors *i.e.* social, economic and geographical, which characterize both needs and costs of public goods provision. We assume that 'need' variables are constant over time.

For *electoral variables*, I use *percentage vote* in the Presidential elections of 1996 and 2000, and alternatively *the Parliament Elections score* by a consulting firm MFK Renaissance, which measures the ratio of pro-incumbent to pro-communist vote in the Parliamentary elections of 1995 (corresponding correlation coefficient is 0.9).

Table 4 shows political indices for 88 members of the Russian Federation.

**Table 4. Political Indices**

<b>Governor related</b>
Leader score
Support of the governor at the last elections
Elected/nominated governor
Tenure
Party affiliation
<b>Tensions with the center</b>
MFK Renaissance rating
Urban Institute rating

Governor related indices include *leader score* (higher values mean higher popularity), *support of the governor at the last elections* (higher values mean higher support), *elected/nominated governor dummy*, party affiliation dummy (noncommunist vs. communist) and *tenure* (number of years in the office). Indices of relationship between

---

<sup>5</sup> See (Kadochnikov et al, 2001) on detailed description of estimating tax potential and expenditure needs.

the governor and the federal center include *MFK Renaissance rating* of tensions with the center and *Urban institute index* (higher values imply higher tensions)<sup>6</sup>.

*Controls* include administrative division dummies, population and variable ethnic-territorial conflicts (with lower values meaning higher ethnic-territorial conflicts).

### **1.4.3 Data Analysis**

All specifications are in real terms<sup>7</sup>. The dependent variable, the ‘need’ variable and population are in per capita terms.

I have analysed two periods: from 1995 to 1999 and 2000-2001. Following developments in the fiscal sphere (reform of 1999-2000) and in the political arena (new president in power), the data clearly show two distinct patterns. Subsamples within two periods include regressions with autonomous districts (88 regions) and without autonomous districts (78 regions). The motivation is twofold. First, regions with this status are too specific. They are either very poor (e.g. Ust-Ordyn Buryat AO) or very rich (e.g. Khanty-Mansiisk, Yamalo-Nenetsk). Some of them are also very small (e.g. Evenki AO and Koryak AO). Second, experts agree on the fact that the quality of statistics in the autonomous districts is poor. In sum, it is likely that autonomous districts might change the results substantially. Pooled OLS and GLS regressions include ‘need’ variable, electoral variables and elected governor dummy (for 1995-1999), and controls. In addition, I have run cross-section regressions with political indices (and controls) for years data were available, 1997 and 1998.

## **1.5 Results**

### **1.5.1 1995 - 1999**

Results of the regressions for the years 1995-1999 are presented in Tables 5-6. In the basic specification, official and iet’s estimates of regional ‘needs’ are significant and positive. Official ‘needs’ explain 52 percent of variation in net transfers, and iet’s ‘needs’ - 40 percent (Table 5). However, if we exclude from the sample autonomous districts, the

---

<sup>6</sup> For a detailed description of both indices, see (Ponomareva and Zhuravskaya, 2004).

<sup>7</sup> End year CPI comes from International Financial Statistics database and the Central Bank of Russia.

basic models show similar explanatory power, with R-squared above 40 percent (see Table 6).

**Table 5. Regression Results, Dependent Variable Net Transfer, with Autonomous districts, Years 1995-1999**

	with Autonomous districts					
	Basic		OLS		Random Effects GLS	
Need' official	0.238*** (0.011)		0.269*** (0.011)		0.280*** (0.023)	
Need' IET		0.693*** (0.043)		0.372*** (0.049)		0.377*** (0.093)
Votes for Yeltsin			0.028*** (0.007)	0.010*** (0.003)	0.030** (0.013)	0.010* (0.006)
Elected governor			0.168 (0.193)	0.156* (0.093)	0.153 (0.140)	0.161** (0.067)
Ethnic-territorial conflicts				-0.009*** (0.003)		-0.009 (0.006)
Population			-0.232*** (0.061)	-0.220*** (0.029)	-0.220* (0.122)	-0.220*** (0.056)
Territory dummy			0.597* (0.313)	0.192 (0.141)	0.600 (0.633)	0.196 (0.271)
Province dummy			0.216 (0.174)	-0.245*** (0.078)	0.230 (0.351)	-0.244* (0.150)
AO dummy			1.398*** (0.272)	1.869*** (0.224)	1.472*** (0.548)	1.860*** (0.432)
City dummy			0.088 (0.579)	-1.986*** (0.398)	0.090 (1.169)	-1.955*** (0.765)
Constant	0.889*** (0.092)	0.062 (0.046)	-0.502 (0.409)	-0.228 (0.201)	-0.575 (0.764)	-0.238 (0.356)
Observations	440	385	440	385	440	385
Adj. R-squared	0.52	0.40	0.61	0.66	0.62	0.67

Note: Here and below standard errors are in parentheses; coefficients are significant \*\*\* - at 1% significance level, \*\* - at 5% significance level, and \* - at 10% significance level.

Adding electoral variables and controls improves the models substantially (R-squared increases to more than 60 percent). In the OLS specification, votes cast for Yeltsin is significant and positive, implying that regions with pro-incumbent votes got higher net

transfers, far above their ‘needs’. This result goes in line with Popov’s (2004) finding that the federal government awarded its loyal supporters with transfers. Random effects GLS regression (with official ‘needs’) suggests, that even after controlling for region-specific effects, the result holds. In the specification with iet’s estimates, votes are positively related to transfers, but the coefficient is lower and the significance level goes down to 10 percent. Note, that iet’s ‘needs’ include only 2 out of 10 autonomous districts.

**Table 6. Regression Results, Dependent Variable Net Transfer, without Autonomous districts, Years 1995-1999**

	without Autonomous districts					
	Basic		OLS		Random Effects GLS	
Need' official	0.193*** (0.011)		0.114*** (0.012)		0.113*** (0.023)	
Need' IET		0.609*** (0.035)		0.316*** (0.041)		0.316*** (0.074)
Vote cast for Yeltsin, 96			0.006** (0.003)	0.005* (0.003)	0.006 (0.005)	0.005 (0.005)
Elected governor dummy			0.143* (0.082)	0.141* (0.080)	0.155** (0.063)	0.149** (0.064)
Ethnic-territorial conflicts				-0.01*** (0.002)		-0.01** (0.005)
Population			-0.260*** (0.024)	-0.222*** (0.024)	-0.260*** (0.045)	-0.223*** (0.044)
Territory dummy			0.297** (0.123)	0.158 (0.119)	0.299 (0.226)	0.160 (0.213)
Province dummy			-0.065 (0.070)	-0.257*** (0.066)	-0.065 (0.128)	-0.068 (0.146)
City dummy			-0.929*** (0.238)	-2.161*** (0.336)	-0.927** (0.437)	-2.152*** (0.603)
Constant	0.491*** (0.060)	-0.037 (0.038)	0.237 (0.167)	-0.006 (0.171)	0.229 (0.283)	-0.013 (0.284)
Observations	390	375	390	375	390	375
Adj. R-squared	0.43	0.45	0.62	0.65	0.63	0.66

However, once autonomous districts are excluded from the data, the coefficient for Yeltsin drops substantially and becomes insignificant in both specifications with official

and let's 'needs' in the Random effects model (See Table 6). The same is true for the *Parliamentary score*'95. (We do not report results with the *Parliamentary score*'95 as they were similar to the ones with presidential votes).

This result is consistent. The Hausman test does not reject  $H_0$  (there is no substantial difference in coefficients of the OLS model and fixed effects model; for instance, for the specification with the Yeltsin vote and official 'needs'  $\text{Prob} > \text{Chi}^2 = 0.79$ ). It appears that the effect of votes on transfers was driven by observations from the autonomous districts. It might be the case that the incumbent government benefits 10 autonomous districts as transfers are more 'politically productive' there in the sense that increases in transfers results in more votes (Schady, 2000). Autonomous districts are characterized by higher than average pro-incumbent votes, high turnovers and overall loyalty to the federal center.

The elected governor dummy is positive and significant across specifications (Table 6). The magnitude of the effect is big. Regions with elected governors received on average nearly 446 thousand rubles of 2000 per capita ( $0.15 * \text{Consumer Price Index}'2000$ ) more in net transfers than regions with nominated governors, which is equal to some 40 percent of the mean net transfer. We consider this result a confirmation of the grantsmanship hypothesis: elected governors with the support of their electorate succeeded in bargaining with the federal centre. We further check the grantsmanship hypothesis with other political indices.

The sign of the region's population is opposite to the one expected according to the GH. The fact that smaller regions get higher transfers might reflect inefficiencies of the existing system of fiscal federalism. Extremely small size of some regions (especially autonomous districts, but not only) might lead to excessive financing of some public goods. In Treisman (1996) population is also negatively correlated with transfers. An explanation he suggests is related to the bargaining power of regions: regions have roughly equal formal access to central ministries and officials, regardless of whether they represent a few hundred thousand or a few million residents.



The significance levels of administrative dummies suggest that only cities – Moscow and St.Petersburg – received less in net transfers relative to republics (the omitted category). This result might be driven by the fact that in Russia taxes are not always paid in the regions, where output is produced (Popov, 2004). For instance, Moscow remits to the federal budget substantially more than some resource rich regions such as Tiumen. Thus, actual taxes remitted by Moscow to the federal center would exceed its objective tax potential. Variable ethno-territorial conflict is significant in the specification with iet's estimates: regions with ethno-territorial conflicts received transfers above their needs. This might suggest some evidence that besides electoral goals, the incumbent government also uses mechanisms of fiscal federalism to solve ethnic problems.

Analysis of cross-section regressions with political indices for 1997 and 1998 confirm results of the pooled regression for 1995-1999 (See Tables 7 and 8).

First, the coefficients for electoral variables decrease substantially and become only marginally significant after observations on autonomous districts are taken from the sample. In the 1997 regression, the coefficient for Yeltsin's vote drops from 0.05 to 0.01, with the t-statistic going down from 3.04 to 1.26 in the OLS reduced model (for 1997 we only report results for Yeltsin's vote, as results for the Parliament score'95 are similar).

In the 1998 regression, the percentage vote for Yeltsin in 1996 is significant at 12 percent and Parliamentary score'95 is significant at 14 percent (reduced models). This might imply that political business cycles are short-lived, and transfers only increase just before elections (here, before the Parliamentary election of 1999), which is consistent with the finding in (Zhuravskaya and Ahmedov, 2004). However, this result should be taken with caution as OLS estimates might overestimate true t-statistics (as was the case with pooled regression)<sup>8</sup>.

Second, significance of all political indices but the elected governor dummy also goes down without autonomous districts. In 1998, regions with elected governors got marginally higher transfers than regions with nominated governors (the corresponding

---

<sup>8</sup> In the random effects model for years 1997-1998 electoral variables are in fact insignificant, although Hausman test suggests that these results are inconsistent i.e. coefficients of the random effects model differ substantially from the coefficients of the fixed effects model.

significance level is 17 percent). Other political indices – governor related indices and the MFK Renaissance index of tensions (we do not report Urban Institute index due to similarity of results) show no (or weak) relationship with net transfers. Thus, the only confirmation for the grantmanship hypothesis is found in the elected governor variable.

**Table 7. Regression Results, Dependent Variable Net Transfer, for Year 1997**

1997	with AO*		without AO	
	OLS full	OLS reduced	OLS full	OLS reduced
Need' official	0.362*** (0.033)	0.398*** (0.028)	0.117*** (0.042)	0.121*** (0.040)
Vote cast for Yeltsin, 96	0.055*** (0.016)	0.053*** (0.017)	0.010 (0.009)	0.011 (0.008)
Elected governor dummy	-0.100 (1.064)		0.281 (0.523)	
Leader score	-0.020* (0.012)	-0.017* (0.010)	-0.003 (0.006)	-0.004 (0.005)
Governor's party affiliation	0.513 (0.597)	0.709 (0.643)	0.055 (0.302)	0.045 (0.290)
Governor's tenure	0.064 (0.094)		-0.004 (0.049)	
MFK Renaissance rating of tensions	0.064 (0.307)		-0.045 (0.154)	
Ethnic-territorial conflicts	0.033** (0.015)	0.033** (0.015)	-0.004 (0.009)	-0.002 (0.008)
Population	-0.250* (0.146)	-0.248* (0.153)	-0.370*** (0.074)	-0.366*** (0.070)
Territory dummy	0.457 (0.748)	0.479 (0.809)	0.532 (0.370)	0.545 (0.359)
Province dummy	-0.269 (0.510)	-0.261 (0.531)	0.025 (0.254)	0.022 (0.237)
AO dummy	1.853*** (0.705)	1.052 (0.725)		
City dummy	-0.065 (1.356)	0.206 (1.451)	-0.755 (0.692)	-0.736 (0.667)
Constant	-3.442** (1.776)	-3.366 (1.622)	0.679 (0.978)	0.742 (0.832)
Observations	86	88	78	78
Adj. R-squared	0.66	0.73	0.59	0.61

\*AO- autonomous districts ('okrugs').

**Table 8. Regression Results, Dependent Variable Net Transfer, for Year 1998**

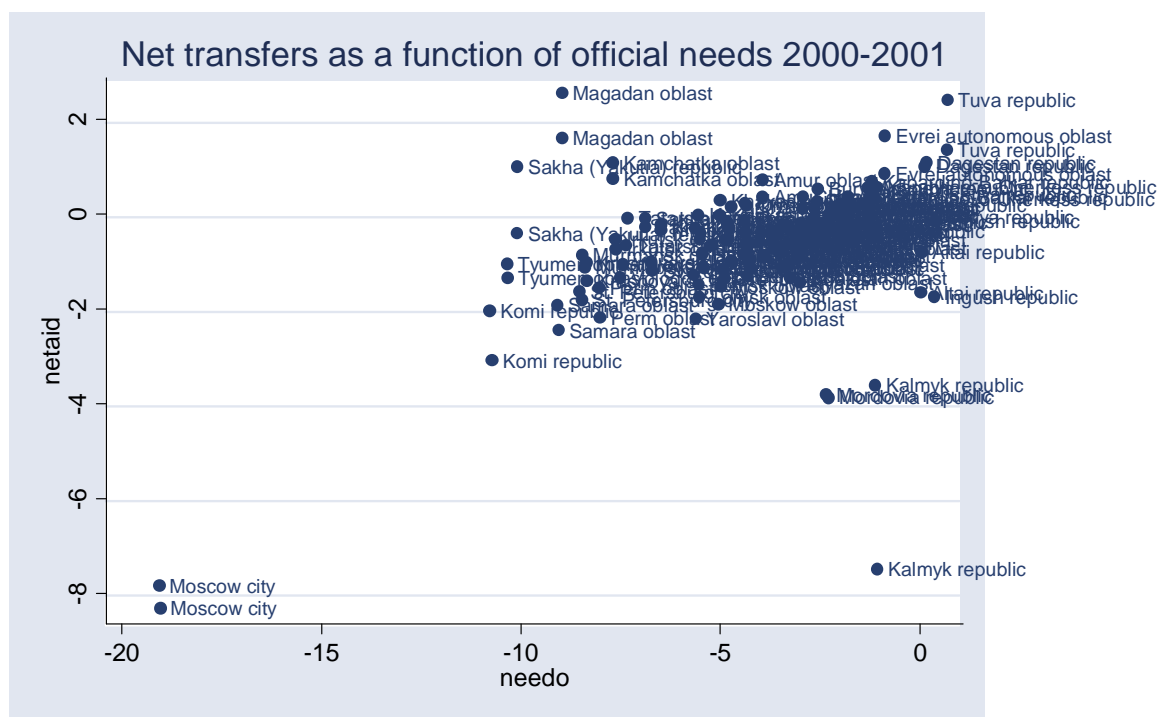
1998	with AO			without AO		
	OLS full	OLS reduced		OLS full	OLS reduced	
Need' official	0.102*** (0.012)	0.100*** (0.011)	0.101*** (0.011)	0.072*** (0.019)	0.073*** (0.017)	0.072*** (0.016)
Vote cast for Yeltsin	0.019*** (0.006)	0.018*** (0.006)		0.005 (0.004)	0.006 <sup>c</sup> (0.004)	
Parliament Score			0.582*** (0.173)			0.167 <sup>d</sup> (0.113)
Elected governor	0.144 (0.408)			0.331 <sup>b</sup> (0.238)	0.300 <sup>b</sup> (0.224)	0.284 (0.228)
Support of the governor	-0.074 (0.058)	-0.063 <sup>a</sup> (0.043)	-0.053 (0.041)	0.020 (0.036)		0.010 (0.023)
Governor's party affiliation	0.008 (0.215)			-0.016 (0.128)		
Governor's tenure	0.036 (0.036)	0.039 (0.032)	0.031 (0.032)	0.001 (0.022)		
MFK Renaissance rating of tensions	0.033 (0.115)			-0.022 (0.068)		
Ethnic conflicts	0.003 (0.006)			-0.006 (0.004)	-0.005 (0.003)	-0.006* (0.003)
Population	-0.183*** (0.053)	-0.185*** (0.051)	-0.201*** (0.051)	-0.180*** (0.032)	-0.178*** (0.030)	-0.185*** (0.030)
Territory dummy	0.195 (0.282)	0.242 (0.263)	0.315 (0.263)	0.229 (0.163)	0.210 (0.155)	0.251 (0.160)
Province dummy	-0.104 (0.202)	-0.029 (0.148)	-0.024 (0.147)	0.032 (0.119)	0.000 (0.103)	0.019 (0.107)
AO dummy	0.919*** (0.272)	0.986*** (0.240)	1.119*** (0.232)			
City dummy	-1.215** (0.520)	-1.135** (0.486)	-1.191** (0.483)	-1.089*** (0.310)	-1.133*** (0.291)	-1.132*** (0.300)
Constant	-0.535 (0.674)	-0.158 (0.315)	-0.568 (0.400)	0.514 (0.446)	0.439 (0.382)	0.344 (0.405)
Observations	86	86	86	78	78	78
Adj. R-squared	0.67	0.69	0.69	0.76	0.77	0.77

Note: a) Support of the governor is significant at 15 percent; b) elected governor is significant at 17 percent; c) vote cast for Yeltsin is significant at 12 percent; d) Parliament election score'95 is significant at 14 percent.

## 1.5.2 2000 - 2001

Expectations that, as a result of the fiscal reform, actual net transfers would become closer to ideal transfers have not been confirmed. Basic model for years 2000-2001 has been explaining worse net transfers, that the one for years 1998-1999 (difference in the R-squared is almost 20 percent). A closer look at the data suggests, that for a number of regions actual transfers are far from regional 'needs' (See Graph 2). For instance, in 2000-2001 Kalmykia have received almost the lowest net transfers, while its needs are one of the highest; in Magadan oblast the opposite is observed. It appears, that net financial flows have in fact become less equalizing than they were in previous years.

**Graph 2 Net Transfers As a Function of Official Needs, 2000-2001**



As far as electoral variables are concerned, both votes for Yeltsin in 1996 and votes cast for Putin in 2000 are insignificant (See Table 9). This is true for the subsample with autonomous districts and for the subsample without autonomous districts. This result is consistent with the findings of Popov (2004) and Koidze (2005).

**Table 9. Regression Results, Dependent Variable Net Transfer, 2000-2001**

	with AO*		without AO	
	2000	2001	2000	2001
Need' official	0.109 (0.086)	0.411*** (0.054)	0.056 (0.052)	0.095 (0.068)
Vote cast for Yeltsin, 96	-0.031 (0.050)		-0.010 (0.011)	
Vote cast for Putin'00		0.020 (0.040)		-0.004 (0.018)
Ethnic-territorial conflicts	-0.020 (0.046)	0.015 (0.033)	-0.016 (0.010)	-0.019 (0.016)
Population	-0.268 (0.450)	-0.157 (0.301)	-0.262*** (0.091)	-0.290** (0.134)
Territory dummy	0.978 (2.398)	1.040 (1.609)	0.946** (0.474)	1.041 (0.697)
Province dummy	0.784 (1.578)	0.442 (1.053)	0.692** (0.314)	0.643 (0.461)
AO dummy	-2.722 (2.163)	-0.198 (1.455)		
City dummy	-0.334 (4.382)	0.454 (2.896)	-1.478* (0.896)	-1.554 (1.313)
Constant	3.262 (4.766)	-1.412 (4.181)	1.642 (1.084)	1.846 (1.940)
Observations	88	88	78	78
Adj. R-squared	0.14	0.43	0.42	0.27

\*AO – autonomous districts ('okrugs').

As far as votes are concerned, observed depolitisation of transfers appears to be true in other areas. The ethnic-territorial conflicts variable is no longer significant. Administrative bias is also disappearing which is consistent with the official policy of the formalization of transfers. If in the year 2000 both provinces and territories continued to benefit relative to republics, in 2001 the significance of both variables goes down. Only the effect of population remains negative and significant across years implying that small Russian regions enjoy benefits in the distribution of transfers.

## 1.6 Conclusions

This paper tested whether intergovernmental transfers in Russia are tactical. Analysis of the panel data provided us with more observations and allowed us to check the consistency of results. The main findings are as follows.

We find only weak confirmation of the electoral hypothesis. Analysis of 1995-1999 suggests that net transfers were used by the incumbent government for reelection purposes only in the autonomous districts (in 10 out of 88 regions). This result is robust across specifications. It is likely that transfers to the autonomous districts are more politically productive and return more votes than in other Russian regions. For other Russian regions we find a marginally significant effect of votes on transfers in year 1998. Consistent with Akhmedov and Zhuravskaya (2004), this might suggest the short-lived nature of political cycles. Previous studies probably overestimated the effect of votes on transfers, as they did not control for region-specific effects and included autonomous districts in the sample. Autonomous districts are likely to change results as they are very specific (due to size, income levels, etc).

We find some evidence for the grantsmanship hypothesis which suggests that powerful regions are rewarded with higher transfers. Regions with elected governors received on average nearly 446 thousand rubles of 2000 per capita more in net transfers than regions with nominated governors, which is equal to some 40 percent of the mean net transfer. Other political proxies of the grantsmanship hypothesis – governor-related variables and indices of tensions with the federal center – showed no relationship with net transfers. Poor performance of political indices might be due to the indirect and subjective character of those measures.

2000-2001 shows clearly a distinct pattern, with election variables having no effect on net transfers. The election cycle of 1999-2000 is considered to be an exception, when the strong federal center for the first time dominated regional elites (Petrov, 2000). It appears that by the end of the century the popular incumbent no longer needed transfers as a mechanism for improving reelection chances. The depolitisation trend also concerns the

administrative status of regions. Consistent with the federal policy of formalization of transfers, administrative division shows no effect on transfer allocation.

## References

- Ahmedov, A. and Zhuravskaya, E. (2004). 'Opportunistic Political Cycles: Test in a Young Democracy Setting', *Quarterly Journal of Economics*, 119, pp. 1301-1338.
- Case, A. (2001). 'Election Goals and Income Redistribution: Recent Evidence from Albania', *European Economic Review*, 45, pp. 405-423.
- Christenko, V. (2001). 'Development of Budget Federalism in Russia: from Money Transfer to Assignment of Authority', in Russian, *Rossiiskaia gazeta*, February, 17.
- Cingranelli, D. (1983). 'Federal Aid to the States as a Presidential Resource', paper presented to the Annual Meeting of the Midwest Political Science Association, Chicago.
- Cox, G. and McCubbins, M. (1986). 'Electoral Politics as a Redistributive Game', *Journal of Politics*, 48, pp. 370-389.
- Dahleberg, M. and Johansson, E. (2002). 'On the Vote-Purchasing Behaviour of Incumbent Governments', *American Political Science Review*, 96, pp. 27-40.
- Downs, A. (1957). *An Economic Theory of Democracy*, New York: Harper & Row.
- Ferejohn, J. A. (1974). *Pork Barrel Politics: Rivers and Harbors Legislation, 1947-1968*, Stanford: Stanford University Press.
- Gaidar, E. et al (1996). *Russian economy in 1995: Tendencies and Perspectives*, in Russian, 14, Moscow: Institute for the Economy in Transition.
- Grossman, G. M. and Helpman, E. (1996). 'Electoral Competition and Special Interest Politics', *Review of Economic Studies*, 63, pp. 265-286.



Horiuchi, Y. (2003). 'Universalism within Districts: Distributive Politics under the SNTV Electoral Rule in Japan', paper presented at the 2003 Annual Meeting of the American Political Science Association, Philadelphia, 28-31 August.

Johansson, E. (2003). 'Intergovernmental Grants as a Tactical Instrument: Empirical Evidence from Swedish Municipalities', *Journal of Public Economics*, 87, pp. 883-915.

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

Kadochnikov, P. et al (2001). 'Estimate of Tax Potential and Expenditure Needs of RF Regions', in Russian, CEPRA series, Institute for the Economy in Transition, <http://www.iet.ru/archiv/zip/cepra/otsenka.zip>.

Koidze, V. (2005). 'Fiscal Federalism Under Putin: Redistribution vs. Retribution', Master Thesis at Stockholm School of Economics, Spring.

Lavrov, A.D. et al. (2001). 'The Reform of Fiscal Federalism in Russia: Market Creating Federalism', in Russian, *Voprosy Ekonomiki*, 4, pp. 32-51.

Ministry of Finance, (2002). 'The Methodology of Transfers from the Fund of Regional Financial Assistance of the RF for year 2000', in Russian, [www.minfin.ru](http://www.minfin.ru).

OECD, (2002). 'Federal budgetary relations: current tendencies and perspectives', in Russian, OECD Economic Outlook: Russia, <http://oecdmoscow.9.com1.ru/economy.html>.

Petrov, N. (2000). 'Federalism, Russian Style', *Pro et Contra*, 5, pp. 7-33.

Pfeffer, J. and Salancik, G.R. (1974a). 'Organizational Decision Making as a Political Process: The Case of a University Budget', *Administrative Science Quarterly*, June, pp. 135-151.

- Pfeffer, J. and Salancik, G.R. (1974b). 'The Bases and Use of Power in Organizational Decision Making: The Case of a University', *Administrative Science Quarterly*, December, pp. 453-473.
- Ponomareva, M. and Zhuravskaya, E. (2004). 'Federal Tax Arrears in Russia: Liquidity Problems, Federal Subsidies, or Regional Protection?', *Economics of Transition*, 12 (3), pp. 373-398.
- Popov, V. (2004). 'Fiscal Federalism in Russia: Rules versus Electoral Politics', *Comparative Economic Studies*, 44(4), pp. 515- 541.
- Rich, M. (1989). 'Distributive Politics and the Allocation of Federal Grants', *American Political Science Review*, 83 (1), pp. 193-213.
- Schady, N. (2000). 'The Political Economy of Expenditures by the Peruvian Social Fund (FONCODES), 1991-1995', *American Political Science Review*, 94 (2), pp. 289-304.
- Shleifer, A. and Treisman, D. (2000). *Without a Map: Political Tactics and Economic Reform in Russia*, Massachusetts Institute of Technology.
- Sinelnikov, S. et al. (2001). 'Impact of Intergovernmental Grants on the Fiscal Behaviour of Regional Authorities in Russia', CEPR series, Institute for the Economy in Transition, <http://www.iet.ru/publication.php?folder-id=44&publication-id=1955>.
- Stein, R. M. (1981). 'The Allocation of Federal Aid Monies: The Synthesis of Demand-Side and Supply-Side Explanations', *American Political Science Review*, 75, pp. 334-43.
- Treisman, D. (1996). 'The Politics of Intergovernmental Transfers in Post-Soviet Russia', *British Journal of Political Science*, 26, pp. 299-335.
- Treisman, D. (1998a). 'Fiscal Redistribution in a Fragile Federation: Moscow and the Regions in 1994', *British Journal of Political Science*, 28, pp. 185-222.
- Treisman, D. (1998b). 'Deciphering Russia's Federal Finance: Fiscal Appeasement in 1995 and 1996', *Europe-Asia Studies*, 50 (5), pp. 893-906.

## 2 Measuring Swing Voters

### Abstract

This paper develops new methodological tools for analyzing multi-party political systems. These tools allow to measure swing voters on two “ideological” dimensions using individual survey data.

The first measure 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. We provide a qualitative description of voters and locations of the parties on the common scale.

The second measure 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. The two proposed swing measures are positively correlated.

## 2.1 Introduction

Recent theoretical models proposed testable empirical predictions as to which group of voters might benefit from distributive politics (Dixit and Londregan, 1996 and 1998; Linbeck and Weibull, 1987; Cox and McCubbins, 1986; Snyder, 1989). One of the main predictions of these models is that grants should be allocated to swing states. Those are states with a large number of indifferent or moderate voters, who are likely to change their votes from one election to another. However, what is missing in the literature is the way swing voters are to be measured if more than two parties compete. This paper makes a methodological contribution in this respect. In particular, it develops two measures that take into account the bi-dimensionality of the Spanish politics using survey data.

The first measure, in the tradition of rational choice literature, and in particular of Downs (1957), assumes that individuals vote for the candidate nearest to the voter on the spatial dimension. Swing voters are defined as those who are equidistant to competing parties. A corresponding measure estimates density at the middle of the distances, or at the cut point.

In Spain, in regions with (imperfect) bi-party systems, electoral competition takes place on the ideological left-right spectrum. These are eleven of the autonomous communities, where the two major statewide parties, the PSOE and the 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. To take into account the bi-dimensionality of Spanish politics, for these regions we estimate bivariate densities at the cutpoints on the left-right and nationalist dimensions.

Previous research has studied Spanish voting behaviour in bi-dimensional space (Padró-Solanet and Colomer, 1992; Riba, 2000; Pérez-Nievas and Fraile, 2000). The two-

dimensional characteristic of the ideology can be seen in the practice of ‘differential abstention’, with lower turnout in regional elections relative to general elections, and of ‘dual voting’, when voters vote for nationalist parties in regional elections, and for state-wide parties in general elections. However, this paper is the first to account for bi-dimensionality in measuring swing voters.

The second measure takes a socio-psychological approach initiated by Campbell et al (1960) in the “American Voter”. It embraces various determinants of votes related to party, candidates and issues. In particular, the estimated likelihood of vote includes distances to parties, evaluation of incumbent performance in the government, personal preferences for party leaders and socio-demographic characteristics such as age, self-reported class and occupation. Here the idea of the swings is to count people with similar predicted likelihoods of voting for parties in a region. Those voters are likely to change their votes from one election to another.

We use individual data from CIS surveys to estimate swing voters in the different regions of Spain using the two above methods. 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. We need these tools to measure swing voters across Spanish regions as, to our best knowledge, the existing electoral surveys on self-reported past voting behaviour are small in size<sup>9</sup>.

In testing theories of distributive politics, Johansson (2003) also uses survey data to measure swing voters. However, the Swedish Election Study has its limitation in that you cannot observe individual preferences. Instead, Johansson (2003) estimates the bias in favour of the socialist bloc on the basis of selected questions using factor analysis<sup>10</sup>. This method 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

---

<sup>9</sup> For instance, in CIS post-electoral surveys, the sample size of the question on past votes for some Spanish regions is less than 20 observations.

<sup>10</sup> For a more detailed discussion, see Johansson (2003) and Dahlberg and Johansson (2002).

Spain. The advantage of the survey this paper uses is that it has direct information on the location of voters on both left-right and nationalist dimensions.

The drawback of swing voter proxies based on the aggregate voting data is that its validity hinges on the underlying assumptions. This is the case with a standard proxy of swing voters – the closeness of the last election. Consider a distribution of ideological preferences with a critical value or cut point, where a voter is indifferent between voting for party A and party B. Under assumptions of two party competition and symmetric and single-peaked distributions of ideological preferences the density at the cut point will be higher (and so the number of swing voters), the closer the race in the election is, since the peak of such a distribution is at the median, and so is the cut point in a close race (Johansson, 2003). If, however, one assumption is violated, even in close elections number of swing voters (and the density) might be low, as in the case of a two-peak distribution.

Another procedure, originated by Wright (1974), 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, Wright (1974) computed a long-run vote share, which is assumed to be the mean of probability distributions of election outcome. Following Wright (1974), Sole and Castells (2005) use the data from 21 Spanish elections (including general, regional, local and elections to the European parliament) to estimate cut-point densities (i.e. density at the PSOE election result) for Spain.

The primary motivation for measuring 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. Campbell 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 PSOE, while in the 90-s the majority gave their votes to 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 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.

## 2.2 Data

We used individual data from the CIS (Centro de Investigaciones Sociológicas) studies 2025-2041 from 1992. Each study was done for a particular autonomous region, with sample sizes ranging from 521 questionnaires in Rioja to 4536 questionnaires in Castilla-Leon.

For the density measure we used information on the self- and major parties locations on the left-right ideological dimension and on the centralist-nationalist dimension<sup>11</sup>. The scales are from 0 to 10. For the count swing measure, in addition we used other variables of interest (see below).

This is a unique dataset 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.

---

<sup>11</sup> 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.

## **2.3 Density Measure**

### **2.3.1 Assumptions**

The basic assumption is that individuals vote for the party nearest to them on the spatial dimension (Downs, 1957). 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. For the moment, we take the proximity approach which assumes that voters are relatively sophisticated. And the data suggests that they are. A large proportion of respondents can place themselves and the main parties on the ideological scale. The lower the distance to the parties (defined as the absolute difference between the party location and self location), the more votes they receive.

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

As far as electoral competition is concerned, we assume that for regions with (imperfect) bi-party systems, it takes place on the ideological left-right spectrum. In regions with strong regional/national identities - Catalonia, Basque country, Galicia, Aragon, Canarias and Navarra - we assume that electoral competition takes place in both left-right and nationalist/regional dimensions. 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.

### **2.3.2 Data Preparation**

First, the raw data needed cleaning. We only use the data of respondents who rank themselves and parties on ideological and nationalist dimensions (in case of three-party



regions)<sup>12</sup>. For two-party regions, we are left with 10762 observations out of the sample of 18446 observations; with three-party regions – with 3353 observations out of 8911. In three-party regions there is also a small number of people (5 percent of the sample), who place all parties at the same location. As it is not clear how to treat those responses in further normalization, we exclude these observations.

We expect that voters have a reasonable ranking of parties. For two-party regions, this means that the socialist party PSOE is located to the left of the conservative party PP, or  $psoex < ppx$ . So, we drop 4 percent of respondents who place  $psoex$  to the right of  $ppx$ .

For three-party regions, we also expect that  $psoex < ppx$ . Location of the regional party (further called REG) on the left-right dimension (further called X-dimension) depends on the 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 1), so we allow for the ranking  $regx < psoex$ , as long as PSOE and REG are not located too far (the assumed threshold is 1).

---

<sup>12</sup> For the swing measure, I need to know how far people located themselves from parties.

**Table 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

On the nationalist (further called Y) 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 2). 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.

**Table 2. 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 2 shows the sample size of three-party regions. Once we account for the inconsistent rankings on both X and Y dimensions, we are left with 207 observations in Aragon, 113 observations in Canarias, 928 in Catalonia, 484 in Galicia, and 537 in the Basque Country.

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 observations.

### 2.3.3 Normalization

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<sup>13</sup>. 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).

$$psoe\bar{x} + \frac{selfx - psoex}{ppx - psoex} \times (pp\bar{x} - psoe\bar{x}), \text{ if } psoex \neq ppx \quad (1)$$

$$psoe\bar{x} + (selfx - psoex), \text{ if } psoex = ppx \text{ and } selfx < psoex \quad (2)$$

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

$$(psoe\bar{x} + pp\bar{x})/2, \text{ if } psoex = ppx = selfx, \quad (4)$$

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

Table 3 shows self, party and normalized self locations for some respondents in Andalusia.

---

<sup>13</sup> 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 himself 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 3. 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	<b>3</b>	<b>8</b>	<b>5</b>	<b>5.72</b>
2	5	8	8	7.95
3	4	5	4	4.24
4	<b>6</b>	<b>6</b>	<b>3</b>	<b>1.24</b>
5	5	9	3	2.38
6	3	8	3	4.24
7	<b>3</b>	<b>9</b>	<b>3</b>	<b>4.24</b>
8	4	10	9	7.33
9	3	9	3	4.24
10	3	10	9	7.42
	Mean PSOE location-X 4.24	Mean PP location-X 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 2.A, 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 2.A. 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 2.A).

We also normalized with respect to other parties (Normalizations 2-4, see Appendix 2.A for details) and checked if the normalization affects the estimated density. It appears that estimates of densities are not too sensitive to the normalization. The resulting correlation coefficients are around 0.9.

**Table 4. 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
Mean location	PSOE 4.19	REG 6.38	PP 7.85		

Examples of normalization with three parties are presented in Table 4.

### 2.3.4 Estimation

Once we have respondents and parties on a common scale, we can measure *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 and average its values along equidistant lines  $y=a+bx$ , where  $a$  and  $b$  are such that resulting  $(x, y)$  satisfy the equal distance condition (using Euclidean distances):

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

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

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 (see, for instance, Figure 2, denoted by stars), and the other – swings between PSOE and PP (denoted by circles).

Table 5 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 5. 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.

### 2.3.5 Description of Bivariate Densities

Figures 1-10 present bivariate densities and contour plots for three party regions. Pictures of bivariate densities show how respondents place themselves on the common (normalized) scale in a particular region. 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.

Densities are most concentrated and peaked in Galicia and Catalonia. It is interesting to note that Galicia in fact has two peaks. The marginal density on Y dimension (see Figure 11) suggests that one peak is formed by moderate centralists and the other by nationalists. In other three regions densities are more spread out, with more people situated in the tails. The Basque Country is especially spread along y dimension (see Figure 13). Overall, all three-party regions have more dispersed marginal densities on the nationalist Y dimension than on the left-right X dimension (three examples are given in Figures 11-13).

Maps provide information on the relative location of individuals to parties. 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). For instance, in Canarias the equidistant line between PSOE and REG goes through the top of the mountain, while the one between PSOE and PP is not. So, in Canarias there are more people who swing between PSOE and REG, than between PSOE and PP. In Catalonia, there are only few swings between PSOE and PP, and the majority changes their votes between PSOE and REG.

## **2.4 Count Swing Measure**

### **2.4.1 Assumptions**

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

We assume the same structure of electoral competition as with the Density measure (see above).

### **2.4.2 Estimation**

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). 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:

$$Vote_i = \alpha + \beta Distance_i + \delta Leader_i + \gamma Performance_i + \eta IndividualCharacteristics_i + \lambda_1 Nationalist_i + \lambda_2 Language_i + \varepsilon_i, \quad (6)$$

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<sub>i</sub>* 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<sub>i</sub>* for the nationalist sentiment (i.e. I feel more Catalan than Spanish) and the knowledge of regional *Language<sub>i</sub>* (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 2.B. 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<sup>14</sup>. 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 6.

---

<sup>14</sup> The outcome with highest predicted probability is assumed to be the predicted outcome.

**Table 6. Summary Statistics of the Predicted Probabilities 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

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 7).

**Table 7. Count Swing Measures 10, 15, and 20.**

Region	Count Swing 10	Count Swing 15	Count 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

The correlation between the Density measure and the Count swing measure is positive, in the range of 0.12 - 0.29. It grows as we increase the threshold of the Count swing measure from 10 to 20 percent. We will use both measures in testing theories of distributive politics in the next Chapter.

## 2.5 Conclusions

This paper develops two new measures of swing voters – the Density measure and the Count swing measure. These measures allow us to test theories of distributive politics. Analysis also adds to the literature on voting behaviour.

The main contribution of this paper is that in measuring swing voters we account for the bi-dimensionality of the Spanish politics. The density measure accounts for swings on both the traditional left-right dimension and the centralist-nationalist dimension by estimating bivariate densities for three-party regions. The count swing measure uses the multinomial probit technique and includes additional controls for the nationalist sentiment.

Incorporating regional/nationalist dimension might also be of interest to other European countries with strong regional parties. This is the case for Germany (CSU in Bavaria), the UK (SNP in Scotland), Belgium (CVP or VLD in Flanders), and Italy (the Northern League, which operates in a number of Northern Italian regions).

We also provide graphical representation of voters and parties locations on the common scale for three-party regions. It illustrates the estimation of the Density measure. In addition, it gives us insights into the nature of electoral competition in each region. It turns out that voters' preferences are not always single-peaked, as in the case of Galicia, and that they tend to be more spread out along the nationalist dimension, than on the left-right dimension.

## Appendix 2.A Normalization

Define the normalization rule:

$$Self_{AB} = \bar{A} + \frac{self - A}{B - A} \times (\bar{B} - \bar{A}), \quad (1)$$

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*

etc...

## Appendix 2.B Determinants of the Vote for PSOE, Multinomial Probit Estimation

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

# Figures

Figure 1. Bivariate Density in Aragon

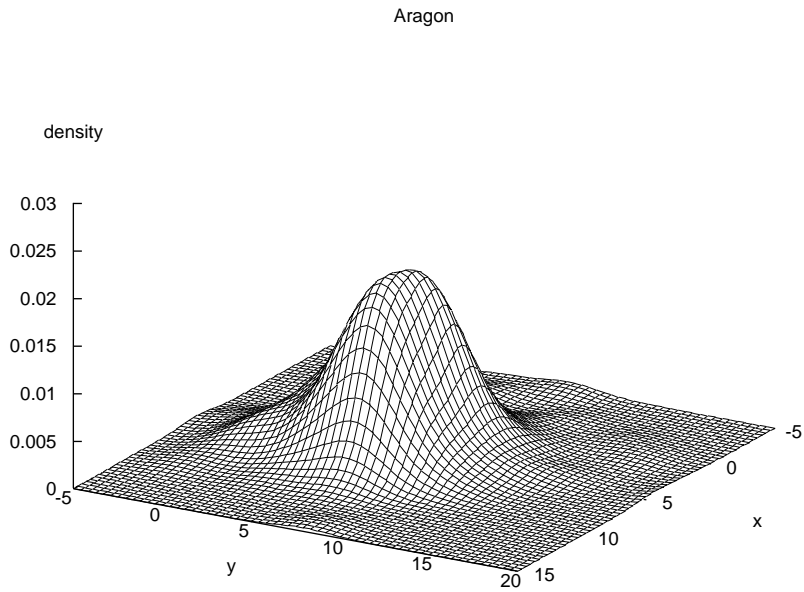
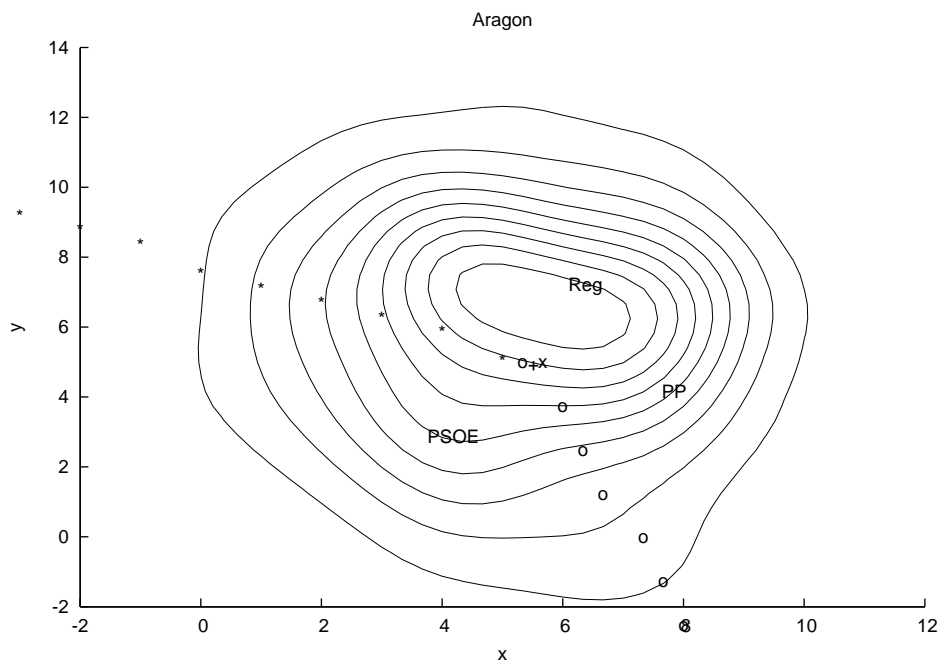
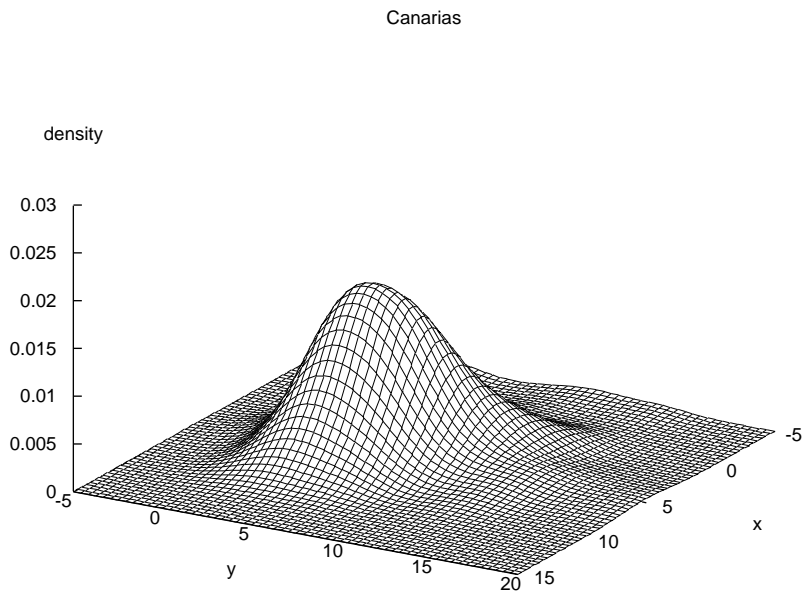


Figure 2. Contour Plot of the Bivariate Density in Aragon

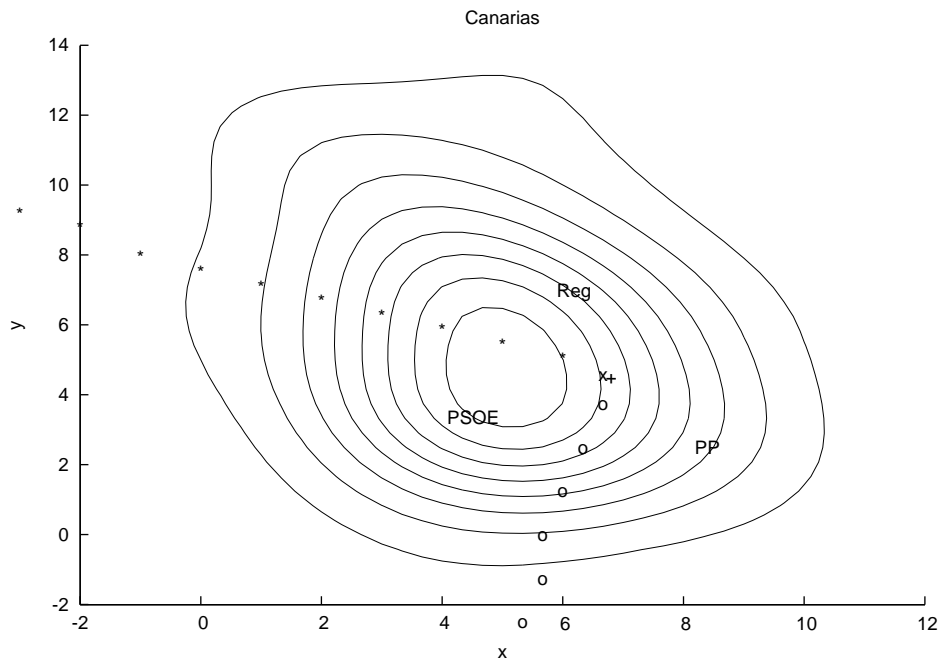




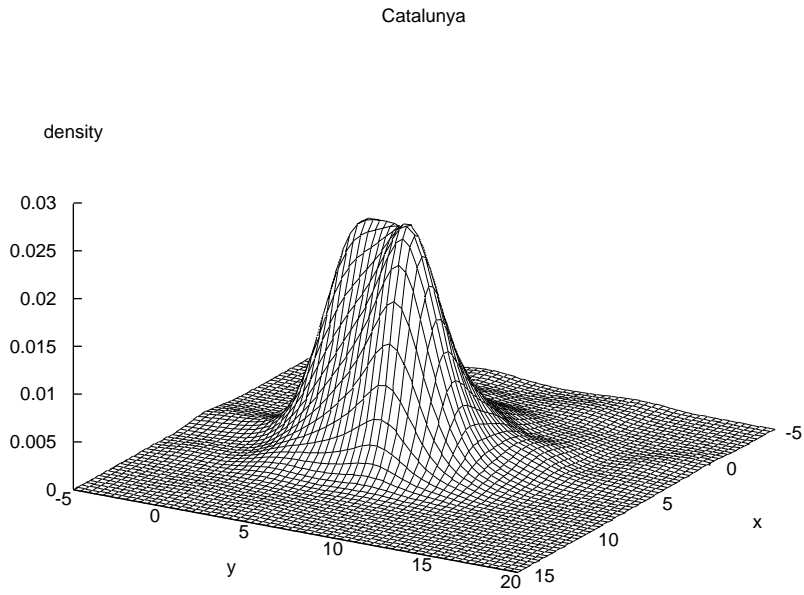
**Figure 3. Bivariate Density in Canarias**



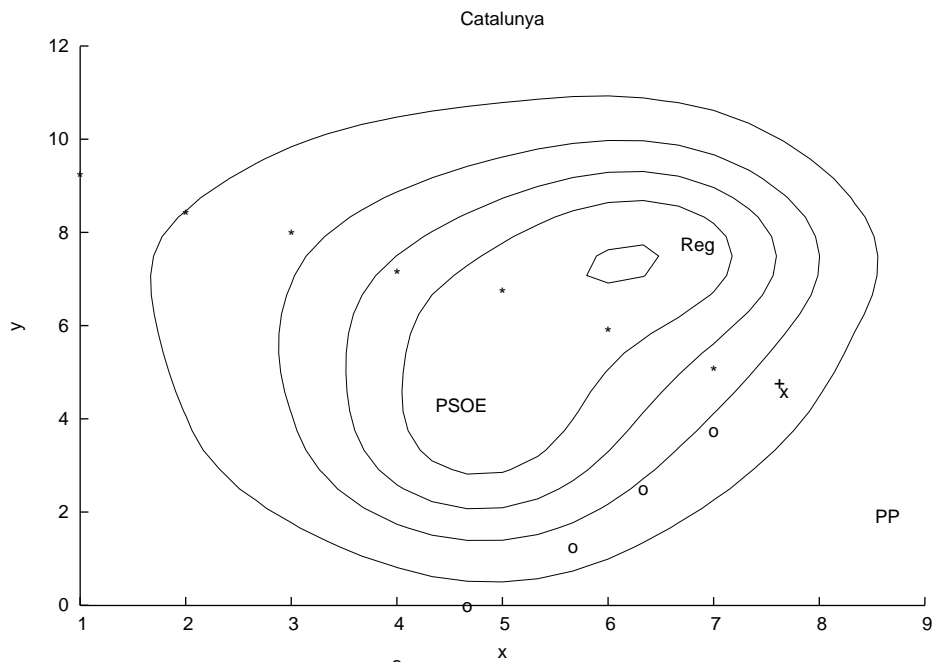
**Figure 4. Contour Plot of the Bivariate Density in Canarias**



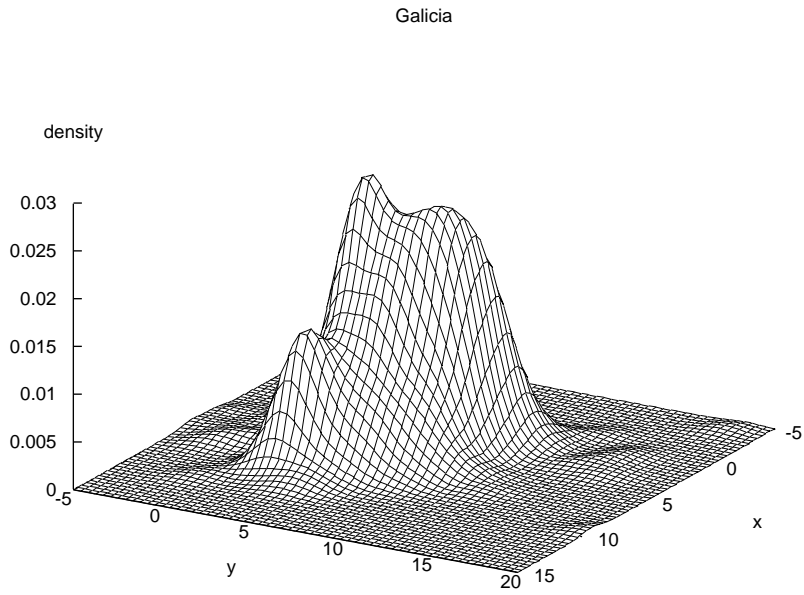
**Figure 5. Bivariate Density in Catalonia**



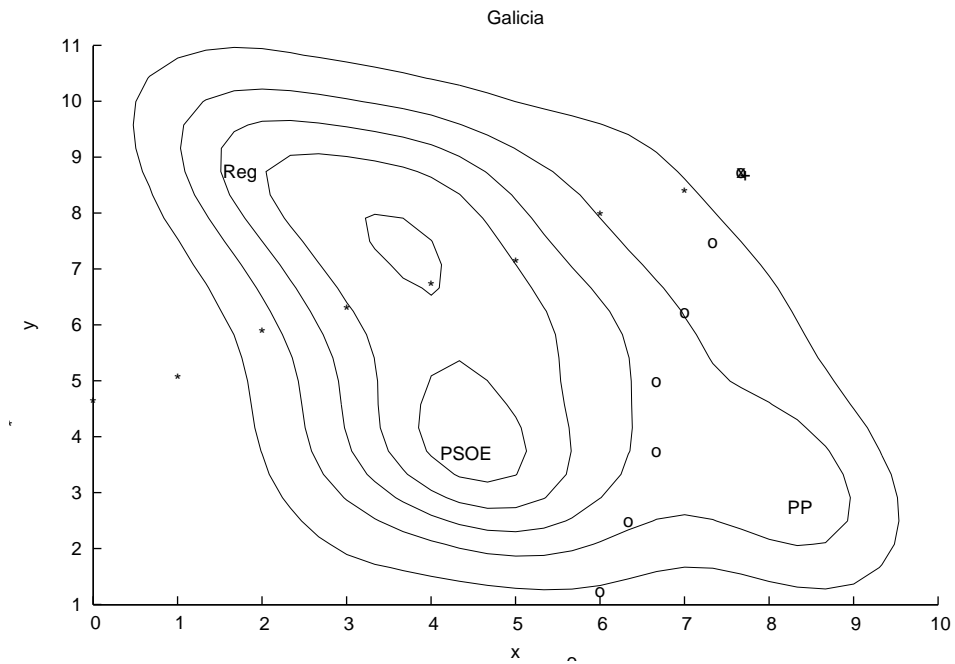
**Figure 6. Contour Plot of the Bivariate Density in Catalonia**



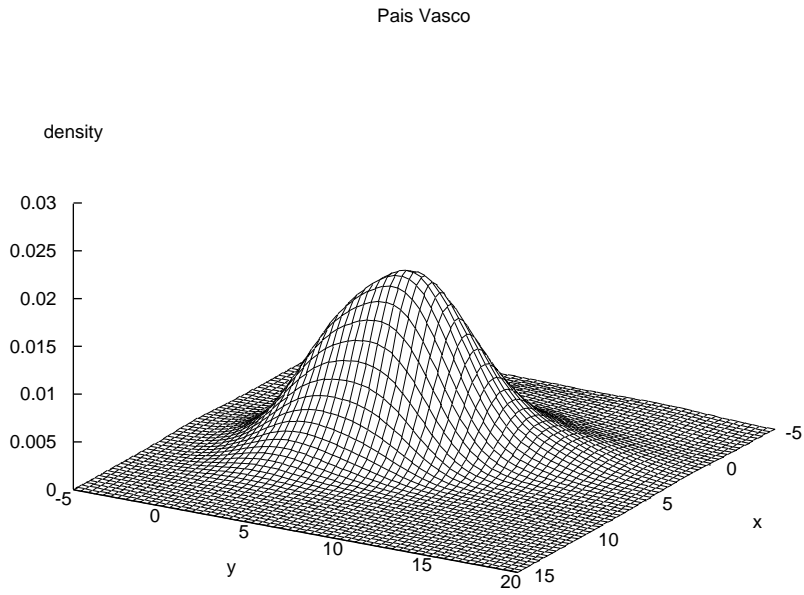
**Figure 7. Bivariate Density in Galicia**



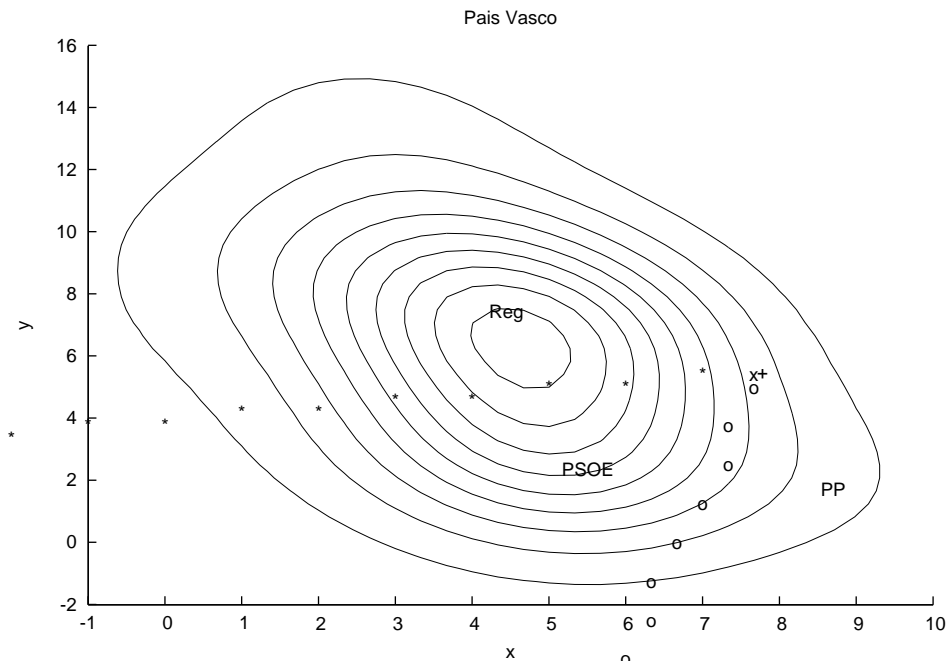
**Figure 8. Contour Plot of the Bivariate Density in Galicia**



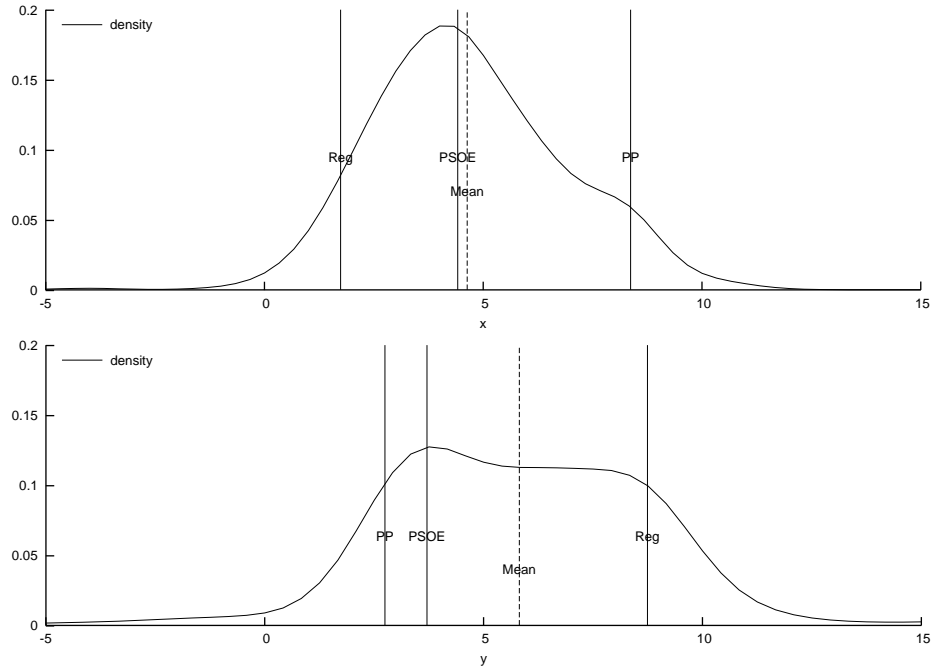
**Figure 9. Bivariate Density in the Basque Country**



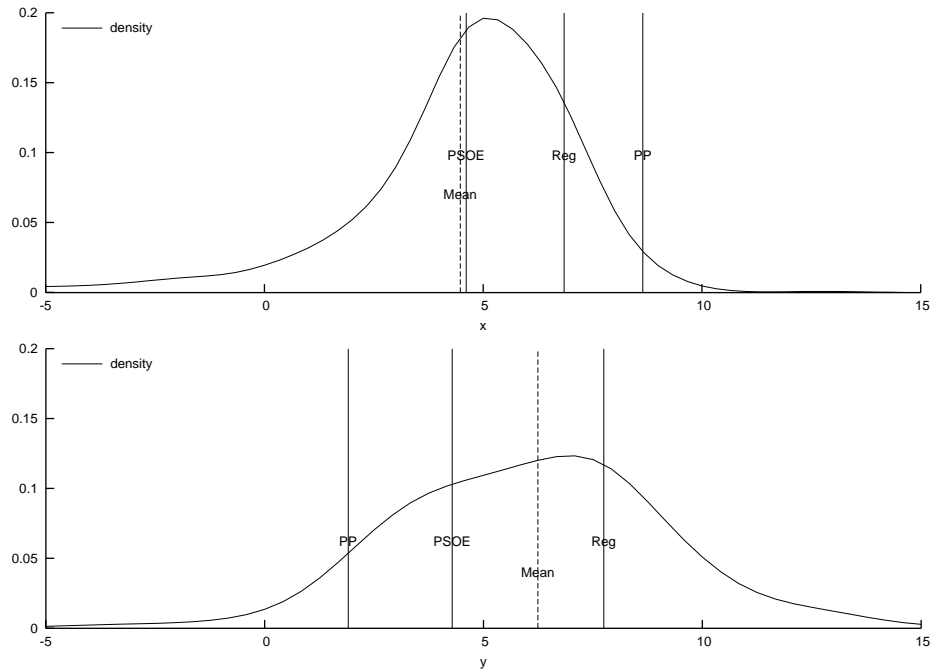
**Figure 10. Contour Plot of the Bivariate Density in the Basque Country**



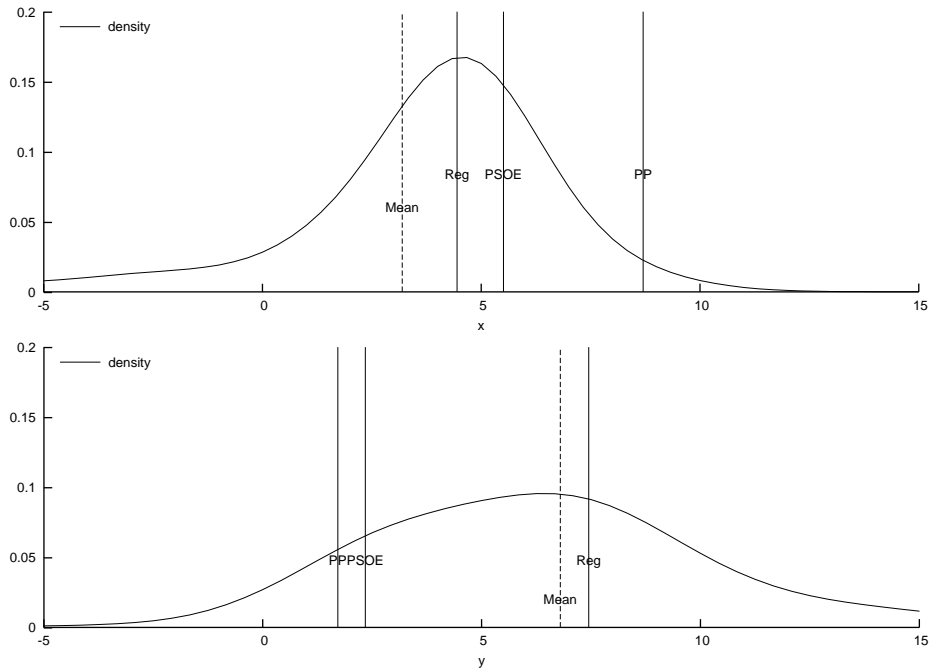
**Figure 11. Marginal Densities on X and Y Dimensions in Galicia**



**Figure 12. Marginal Densities on X and Y Dimensions in Catalonia**



**Figure 13. Marginal Densities on X and Y Dimensions, the Basque Country**



## References

Cambell, Angus, Converse, Philip E., Miller, Warren E. and Stokes, Donald E. *The american voter*. New York: Wiley,1960.

Castells, Antoni and Albert Sole-Olle. "The Regional Allocation of Infrastructure Investment: The Role of Equity, Efficiency and Political Factors." *European Economic Review*, 2005, 49 (5), pp. 1165-1205.

Colomer, Josep. *Political institutions*. Oxford U.P.,2003.

- Cox, G. and M. McCubbins. "Electoral Politics as a Redistributive Game." *Journal of Politics*, 1986, 48, pp. 370-389.
- Dahlberg, M. and E. Johansson. "On the Vote-Purchasing Behavior of Incumbent Governments." *American Political Science Review*, 2002, 96 (1), pp. 27-40.
- Dixit, Avinash and John Londregan. "Ideology, Tactics, and Efficiency in Redistributive Politics." *Quarterly Journal of Economics*, 1998, 113 (2), pp. 497-529.
- , "The Determinants of Success of Special Interests in Redistributive Politics." *Journal of Politics*, 1996, 58 (4), pp. 1132-1155.
- Downs, Anthony. *An economic theory of democracy*. New York: Harper and Row, 1957.
- Fiorina, Morris P. *Retrospective voting in american national elections*. New Haven: Yale University Press, 1981.
- Garcia-Milà, T. and McGuire, T. "Fiscal decentralization in Spain: An asymmetric transition to democracy," in Richard M. Bird and Robert D. Ebel, eds., *Subsidiarity and solidarity: The role of intergovernmental fiscal relations in maintaining an effective state in diverse countries*, Cheltenham, UK: Edward Elgar, 2006, forthcoming.
- Hillygus, D. S. and S. Jackman. "Voter Decision Making in Election 2000: Campaign Effects, Partisan Activation, and the Clinton Legacy." *American Journal of Political Science*, 2003, 47 (4), pp. 583-596.

- Johansson, E. "Intergovernmental Grants as a Tactical Instrument: Empirical Evidence from Swedish Municipalities." *Journal of Public Economics*, 2003, 87 (5-6), pp. 883-915.
- Lindbeck, A. and J. W. Weibull. "Balanced-Budget Redistribution as the Outcome of Political Competition." *Public Choice*, 1987, 52, pp. 273-297.
- Molas, Isidre and Oriol Bartomeus. "Els Espais De Frontera Entre Els Electorats. Estructura De La Competència Política a Catalunya (II)." *WP Institut De Ciències Polítiques y Socials*, 1999,.
- Niemi, Richard G. and Weisberg, Herbert F. *Controversies in voting behavior*. Washington D.C.: Congressional Quarterly Press, 1993.
- Padró-Solanet, Albert and Josep M. Colomer. "Modelos Espaciales y Temas De Campaña. El Caso De Las Elecciones Autonómicas De Cataluña De 1992." *Revista De Estudios Políticos*, 1992, 78.
- 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,.
- Riba, Clara. "Voto Dual y Abstención Diferencial. Un Estudio Sobre El Comportamiento Electoral En Cataluña." *Revista Española De Investigaciones Sociológicas*, 2000, 91, pp. 59-88.
- Snyder, James M. "Election Goal and the Allocation of Campaign Resources." *Econometrica*, 1989, 57 (3), pp. 637-660.



- Torcal, M. and P. Chhiber. "Elites, Cleavages y Sistema De Partidos En Una Democracia 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.
- Wright, Gavin. "The Political Economy of New Deal Spending: An Econometric Analysis." *The Review of Economic Statistics*, 1974, 56 (1), pp. 30-38.

# 3 Testing Models of Distributive Politics: The Case of Spain

## Abstract

This paper extends empirical literature on political economy of intergovernmental transfers to multiparty systems that are typical for most European countries. It proposes new methods to test theories of distributive politics from individual surveys.

The evidence on tactical considerations in Spanish discretionary grants is mixed. 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 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. For allocation of investment programs, we cannot find any significant effect of political variables.

### 3.1 Introduction

The political economy of public expenditure has been an active subject of research during the last decades. The vast empirical literature has shown that, when allocating public monies, equity and efficiency are not the only considerations and political factors often play an important role<sup>15</sup>. However, many of these papers were ad hoc about which political variables to include. Recent theoretical models proposed testable empirical predictions as to which group of voters might benefit from distributive politics<sup>16</sup>. Two (not necessarily exclusive) predictions are that parties might favor *loyal* voters, or/and *swing* voters. This paper extends tests of models of distributive politics to multiparty systems that are typical for most European countries. It proposes new methods to test theories of distributive politics from individual surveys.

Spain is one example of multiparty systems, with two main nationwide parties and strong regional parties. In some Spanish regions, like Catalonia, the Basque Country and Canary Islands nationalist and regionalist parties are particularly strong and sometimes win in the general and regional elections. In the 1990s, both major parties had single-party minority governments, maintained in power by the more or less formal parliamentary support provided by nationalist parties (Linz and Montero, 1999).

As a result of multiparty competition, some standard proxies for testing theories of distributive politics are inappropriate. For instance, closeness of election in a region is not a good proxy for a swing state where more than two parties compete<sup>17</sup>. Moreover, in contrast to two-party (often winner-takes all) systems, in proportional systems electoral rules might change relative political productivity of regions.

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) test theories of distributive politics for public investment in infrastructure. Earlier political economy studies of public expenditure for

---

<sup>15</sup> Rich (1989) provides a detailed survey of the early studies.

<sup>16</sup> For an overview of the theoretical and empirical literature, see the next section.

<sup>17</sup> See (Snyder, 1990) for a discussion on the issue.

Spain include Boix (1996), Bosch and Suarez Pandiello (1994) and Salinas Sanchez (1991).

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 measures of swing voters which capture multiple parties. First, we estimate bivariate densities at the cutpoints where a voter is equidistant to the two closest parties on the survey data from Spanish electoral studies. Second, we construct a swing count measure, which counts voters with similar predicted likelihoods of voting for parties in the region. We also draw from the individual data to proxy incumbents' core supporters better.

The focus of this paper is on discretionary grants. These include state subventions (grants for policies, e.g. social policies) and joint investment programs ("convenios de inversion"). These grants are suitable for testing partisan theories, as the central government has a considerable say in their distribution. Discretionary grants are distinct from other grants in that no prescribed formula exists. In fact, the objective of discretionary grants has not been specified in the legislation (Monasterio and Suarez, 1998). Discretionary grants are economically important: they totaled an annual average of 1697 billion Euros in the period 1986-1996, or some 6 percent of total grants.

The evidence on tactical considerations in discretionary grants is mixed. 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 swing regions 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. For allocation of investment programs, we cannot find any significant effect of political variables.

## 3.2 Theories and Evidence on Distributive Politics: Formulating Hypotheses

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. “Political strength” in bringing money to the district might also be determined by representatives’ seniority (i.e. the number of times elected in the past elections) and personal background, as in (Horiuchi 2003). Traditional domains of pork barrel politics include defense contracting (Johnston 1979), projects on “rivers and harbors” (Ferejohn 1974).

To explain how a group of legislators can pursue programs that benefit their constituencies at the expense of others, Shepsle and Weingast (1981) developed a model of *universalism*. In this model legislators are uncertain over the composition of the winning coalition, but they can get benefits only if they belong to the winning coalition. So universalism works as insurance with respect to risk-averse behavior of the legislators (fear of not being part of the winning coalition). Legislation with highly localized benefits might pass with near-unanimity through the inclusion of the project for all legislators who want one.

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 be 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 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. 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. Spain is different as it 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). Therefore, in addition to political factors mentioned above, the Spanish electoral system makes some regions more productive than others as you need fewer votes there to gain an additional representative.

For Spain, 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)<sup>18</sup>. The basic idea is that economic movements just before election can be decisive, and voters

---

<sup>18</sup> Alesina, Roubini and Cohen (1997) provide detailed survey of theoretical and empirical literatures of opportunistic political cycles.



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

### 3.3 Data

Annual series on discretionary grants come from the database *BADESPE*, developed by the Spanish Institute of Fiscal Studies (<http://www.estadief.minhac.es>). These include state subventions ('subvenciones gestionadas') and joint investment programs ('convenios de inversion') from the federal government to regional governments<sup>19</sup>. 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 allocated to agriculture, public investment in infrastructure, research and technological development. For investment programs, the moneys are mainly spent on public works (transportation infrastructure), followed by social services (various social programs e.g. Plan of the Family Support).

Economic and demographic controls are available from the Spanish Institute of Statistics (INE).

---

<sup>19</sup> Spain is divided into 17 "self-governing communities" ('Comunidades Autónomas'), or regions, 50 provinces and about 8000 municipalities.

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](http://www.eleweb.net)). Individual survey data are from the CIS (Centro de Investigaciones Sociológicas) studies 2025-2041 from 1992.

We will analyse data on 17 Spanish regions from 1986 to 1996. 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).

## 3.4 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.

### 3.4.1 Subventions

#### 3.4.1.1 Specification

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

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

where  $SUBV_{it}$  is the logarithm of per capita subventions in region  $i$  at time  $t$ . For subventions, Basque Country and Navarra were excluded, as these regions were not eligible for those types of grants.  $Econ_{it}$  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*<sup>20</sup>. *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<sup>21</sup>.

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<sub>it</sub>* – a dummy that equals 1 for *High responsibility regions* and for years 1986-1991<sup>22</sup>. 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  $\tau_t$  to control for the fact that the total amount of funds received has changed over time.

Variables *Loyal<sub>it-1</sub>* and *Swing<sub>it-1</sub>* 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.

---

<sup>20</sup> 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.

<sup>21</sup> 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.

<sup>22</sup> High responsibility regions include Andalusia, Canary Islands, Catalonia, Galicia and Valencia.

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 this question is usually described as party identification (see, for instance, Torcal et al, 2001)<sup>23</sup>. This and other survey variables are available only as cross-section<sup>24</sup>. 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*, *Swing count measure*, *Actual swings*, *Undecided* and *Swing dummy*. All proxies but the last are from the CIS survey. For them,  $Swing_{it-1} = Swing_i$ .

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. We also look at the ideological preferences of voters, but instead define the cutpoint such that a voter is equidistant to the two closest parties. Then those voters are expected to swing between elections. This assumption is based on the spatial theory (Downs, 1957). An alternative method is to define the cutpoints according to the distribution of votes in the last election (see, for instance Johansson, 2003). *Density 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 2 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

---

<sup>23</sup> The corresponding question in the survey is: Do you find yourself politically very close, close, neither close nor far, far and very far to PSOE?

<sup>24</sup> 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.

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*<sup>25</sup>. 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.

*Swing count* measure 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% (*Swing count measure, 15*) or 20% (*Swing count measure, 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 2 for details). *Actual swings* are those who swung from one election to another<sup>26</sup>. *Undecided* are those who at the moment of the survey (1992) still did not 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<sub>it-1</sub>* 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

---

<sup>25</sup> The three-party region dummy is equal to 1 for Catalonia, Aragon, Galicia and Canarias.

<sup>26</sup> In the CIS survey of 1992 we have information of the past vote (general election of 1989) and the intention to vote in 1993.

(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<sup>27</sup>.

### 3.4.1.2 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 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  $H_0$  of the coefficients similarity with the fixed effects model (which is consistent under both  $H_0$  and  $H_{alt}$ ). We also estimate

---

<sup>27</sup> 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.

robust standard errors to control for potential serial correlation in the error terms (see Wooldridge, 2002).

### 3.4.1.3 Results

Table 1 presents estimates of the economic variables and controls on the logarithm of per-capita subventions. 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.

Tables 2 and 3 add estimates of various political variables on the logarithm of per-capita subventions. Table 2 includes *Socialist vote share* based on the aggregate data as a proxy for core supporters, while Table 3 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 1, 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.

The results in Tables 2 and 3 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 4 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 4). We took the average coefficient under Socialist vote share across columns 1-7 of the Table 2 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 4).

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 4). 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<sup>28</sup>.

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.

---

<sup>28</sup> We also added the interaction term Three-party\*Swing count measure to check if the sign on the Swing count measure changes, but it remains negative.

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.

In addition, we 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.

## 3.4.2 Investment Programs

### 3.4.2.1 Specification

For investment programs one would expect that investment today depends on the investment yesterday. Roads are not built in one year, but construction lasts longer. Therefore, the model for investment programs should include the lagged dependent variable on the right hand side.

The following equation is estimated on the dynamic panel data using the procedure developed by Arellano and Bond (1991):

$$INVEST_{it} = \alpha + \rho INVEST_{it-1} + \beta Econ_{it-1} + \delta_1 Loyal_{it-1} + \delta_2 Swing_{it-1} + \delta_3 Polit_{it-1} + v_i + \varepsilon_{it} \quad (2)$$

$i = 1, \dots, 17; T = 1986, \dots, 1996$

where  $INVEST_{it}$  and  $INVEST_{it-1}$  are the logarithms of per capita investment programs in region  $i$  at time  $t$  and  $t-1$ .  $Econ_{it-1}$  is a vector of economic and demographic controls, similar to the one in the equation (1). The assumption on timing is that the decision made by the government in time  $t$  is based on the economic variables in the previous period,  $t-1$ . Investment decisions are most likely to be based on the most recent data available from each region, which is generally from the previous calendar year.

In this paper we are only testing time varying political variables, as time invariant variables are canceled out in the panel dynamic estimation. So, (2) includes *Socialist vote*

*share* as a *Loyal* proxy, *Swing dummy* as a *Swing* proxy, and *Turnout*, *Majority in the regional government* and *Price of the seat* as *Political* proxies.

First differencing the above equation removes the regional unobserved effect  $v_i$  and introduces correlation between lagged dependent variable and the error term  $\varepsilon_{it}$ . This results in inconsistent OLS estimates. To avoid this problem, Andersen and Hsiao (1981) suggested that further lags of dependent variable are uncorrelated with the error term and might be used as instruments for the endogenous lagged variable. In our example the Arellano and Bond estimator uses 8 lags of dependent variable ( $T - \text{Number of lags of dependent variable} - 2$ ) and first differences of the exogenous explanatory variables as instruments.

### **3.4.2.2 Results**

Table 5 presents results of estimation of Equation (2). First, one should note that the lagged dependent variable Log INVEST is positive and significant, which confirms assumed serial correlation of Investment grants. The *Sargan test of instrument validity*, presented at the bottom of Table 5 does not reject the null hypothesis that over-identifying restrictions are valid. The *Arellano-Bond test of second order correlation in errors* ( $H_0$ : no autocorrelation) suggests that no second order correlation is present. The assumption of no second-order serial correlation is crucial in guaranteeing the consistency of the Arellano-Bond estimator.

Economic variables are significant. *Logarithm of output* enters with positive sign, so regions with higher output per capita were getting higher investment grants. Castells and Sole-Olle (2005), following the approach of Berhman and Craig (1987) assume that investing in regions with higher output is based on efficiency considerations. The authors also found positive relationship between public investment in infrastructure and output. Social services segment of the ‘convenios’ might explain positive signs of *Share of old* and *Share of young*.

*Socialist vote share* and *Swing dummy* are instead insignificant. Other political proxies all turn insignificant. Thus, for the investment programs we do not find any evidence for the tactical use of grants.

Results on investment programs might be more robust if we include more years in order to capture the potential effect of political variables. Further analysis is needed to test time invariant political proxies from electoral surveys. Possible techniques include extensions of Hausman and Taylor (1981) estimation to dynamic panel data.

### **3.5 Conclusions**

We tested partisan theories of distributive politics for the case of Spain. We focused on the discretionary grants that are suitable for investigating vote purchasing behaviour of incumbent governments. The new measures for swing and loyal regions from electoral surveys allowed us to take into account the multiparty competition of Spanish politics. 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. On the other hand, swing regions 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).

On the other hand, we do not find any significant effect of political variables for investment programs. This result, however, should be taken with caution as we test only a limited number of political variables and the sample is small relative to the number of controls. Further analysis is needed to test time invariant political proxies from electoral surveys. One should also note that investment programs are on average four times smaller than subventions.

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.

## Tables

**Table 1. 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 [0.14]**	-1.01 [0.22]***	-0.93 [0.21]***	-1.02 [0.21]***
Log Population	0.18 [0.04]***	0.18 [0.04]***	0.10 [0.03]***	0.13 [0.04]***
Share of young	0.09 [0.02]***	0.09 [0.01]***	0.07 [0.01]***	0.06 [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 [0.08]***	0.38 [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%.

**Table 2. 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 [0.76]***	2.06 [0.77]***	3.24 [0.73]***	3.17 [0.67]***	2.68 [0.73]***	2.51 [0.70]***	2.99 [0.73]***
Swing count measure, 15	-3.78 [1.88]**						
Swing count measure, 20		-5.63 [1.69]***					
Density at the cutpoints			2.15 [1.52]	-2.67 [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 [0.83]	1.94 [0.85]**	1.60 [0.92]*	1.30 [0.85]	0.67 [0.91]	0.92 [0.85]	1.12 [0.85]
Log Price of the seat	-0.14 [0.14]	-0.21 [0.13]*	-0.01 [0.19]	-0.59 [0.23]**	-0.23 [0.13]*	-0.30 [0.13]**	-0.24 [0.13]*
Majority in the regional government	-0.14 [0.07]**	-0.10 [0.06]	-0.14 [0.07]*	-0.10 [0.07]	-0.17 [0.06]***	-0.17 [0.06]***	-0.18 [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 3. 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 [0.61]***	1.76 [0.61]***	2.29 [0.57]***	2.15 [0.56]***	2.51 [0.57]***	2.02 [0.58]***	2.28 [0.57]***
Swing count measure, 15	-4.34 [1.84]**						
Swing count measure, 20		-5.85 [1.68]***					
Density at the cutpoints			0.54 [1.53]	-4.12 [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 [0.81]*	2.20 [0.82]***	1.69 [0.98]*	1.43 [0.93]	0.32 [0.90]	1.21 [0.85]	1.55 [0.84]*
Log Price of the seat	0.04 [0.13]	-0.07 [0.12]	0.00 [0.20]	-0.58 [0.24]**	-0.02 [0.13]	-0.15 [0.13]	-0.07 [0.13]
Majority in the regional government	-0.10 [0.06]*	-0.07 [0.06]	-0.12 [0.07]*	-0.08 [0.07]	-0.13 [0.06]**	-0.13 [0.06]**	-0.14 [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.

**Table 4. The Magnitude of the Political and Economic Variables on the Per-Capita Subventions**

	(1)	(2)
<b>Loyal proxies:</b>		
Socialist Vote Share	0.18	
Loyal supporters		0.10
<b>Swing proxies:</b>		
Swing count measure, 15	-0.06	-0.07
Swing count measure, 20	-0.11	-0.11
Density at the cutpoints*	-0.10	-0.16
Actual swings	-0.06	-0.12
Undecided	-0.07	-0.07
<b>Political proxies:</b>		
Turnout	0.06	0.07
Log Price of the seat	-0.05	-0.02
<b>Economic variables:</b>		
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.

**Table 5. The Effect of the Economic and Political Variables and Controls on the Distribution of Per-Capita Investment Programs, 1986-1996**

Log Investment Programs	
Lagged Log Investment	0.38 [0.09]**
Log Output	5.43 [1.92]**
Log Population	20.69 [6.71]**
Share of young	0.56 [0.28]*
Share of old	1.23 [0.39]**
Socialist Vote Share	3.78 [6.11]
Swing dummy	-0.07 [0.40]



Political proxies	YES
Observations	153
Number of id	17
Sargan test (Instrument Validity)	56.96
<i>p-value</i>	[0.09]
Arellano-Bond test (first-order serial correlation)	
<i>z-statistic</i>	-5.3
Arellano-Bond test (second-order serial correlation)	
<i>z-statistic</i>	0.28

Note: \* significant at 5% level, \*\* significant at 1% level.

## References

Alesina, A., Roubini, N. and Cohen, G. D. *Political cycles and the macro economy*. Cambridge:

MIT Press, 1997.

Anderson, T. W. and C. Hsiao. "Estimation of Dynamic Models with Error Components."

*Journal of the American Statistical Association*, 1981, 76, pp. 598-606.

Ansolabehere, Stephen and James M. Snyder. "Party Control of State Government and the

Distribution of Public Expenditures." *MIT Department of Economics Working Paper 03-28*,

2003.

Arellano, M. and S. Bond. "Some Tests of Specification for Panel Data: Monte Carlo Evidence

and an Application to Employment Equation." *The Review of Economic Studies*, 1991, 58,

pp. 277-297.

Berhman, J. R. and S. G. Craig. "The Distribution of Public Services: An Exploration of Local

Government Preferences." *American Economic Review*, 1987, 77, pp. 315-332.

Boix, Carles. *Partidos politicos: Crecimiento e igualdad. estrategias economicas conservadoras y socialdemocratas en la economia mundial*. Madrid: Alianza Editorial, 1996.

Bosch, Nuria and Suarez, J. *Hacienda local y eleccion publica. el caso de los municipios españoles*. Bilbao: Fundacion BBV, 1994.

Case, Anne. "Election Goals and Income Redistribution: Recent Evidence from Albania." *European Economic Review*, 2001, 45, pp. 405-423.

Castells, Antoni and Albert Sole-Olle. "The Regional Allocation of Infrastructure Investment: The Role of Equity, Efficiency and Political Factors." *European Economic Review*, 2005, 49 (5), pp. 1165-1205.

Colomer, Josep. *Political institutions*. Oxford U.P., 2003.

Cox, G. and M. McCubbins. "Electoral Politics as a Redistributive Game." *Journal of Politics*, 1986, 48, pp. 370-389.

Dahlberg, M. and E. Johansson. "On the Vote-Purchasing Behavior of Incumbent Governments." *American Political Science Review*, 2002, 96 (1), pp. 27-40.

Dasgupta, Sugato, Dhillon, Amrita and Dutta, Bhaskar. *Electoral Goals and Centre-State Transfers in India*. Unpublished Paper, 2001.

Dixit, Avinash and John Londregan. "The Determinants of Success of Special Interests in Redistributive Politics." *Journal of Politics*, 1996, 58 (4), pp. 1132-1155.

Downs, Anthony. *An economic theory of democracy*. New York: Harper and Row, 1957.

- Esteller-Moré, Alejandro. "Is there a Connection between the Tax Administration and the Political Power?" *International Tax and Public Finance*, 2005, 12 (5), pp. 639-663.
- Ferejohn, J. A. *Pork barrel politics: Rivers and harbors legislation, 1947-1968*. Stanford: Stanford University Press, 1974.
- Hausman, Jerry A. and William E. Taylor. "Panel Data and Unobservable Individual Effects." *Econometrica*, 1981, 49 (6), pp. 1377-1398.
- Horiuchi, Y. "Universalism within Districts: Distributive Politics Under the SNTV Electoral Rule in Japan." *Annual Meeting of the American Political Science Association*, Philadelphia, 28-31 August 2003.
- Johansson, E. "Intergovernmental Grants as a Tactical Instrument: Empirical Evidence from Swedish Municipalities." *Journal of Public Economics*, 2003, 87 (5-6), pp. 883-915.
- Johnston, R. J. *Political, electoral, and spatial systems*. Oxford: Oxford University Press, 1979.
- Kahneman, Daniel and Amos Tversky. "Prospect Theory: An Analysis of Decision Under Risk." *Econometrica*, 1979, 47 (2), pp. 263-292.
- Levitt, Steven D. and James M. Potterba. "Congressional Distributive Politics and State Economic Performance." *Public Choice*, 1999, 99 (1-2), pp. 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.
- Monasterio, C. and Suarez, J. *Manual de hacienda autonómica y local*. Barcelona: Ariel, 1998.
- Musgrave, Richard A. and Musgrave, Peggy B. *Public finance in theory and practice*. New York: McGraw-Hill, 1989.
- 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.
- Rich, M. "Distributive Politics and the Allocation of Federal Grants." *American Political Science Review*, 1989, 83 (1), pp. 193-213.
- Rodden, Jonathan and Wilkinson, Steven. *The Shifting Political Economy of Redistribution in the Indian Federation*. Unpublished Paper, 2004.
- Salinas, J. *Economía política del federalismo fiscal español*. Madrid: Ministerio de Economía y Hacienda. Instituto de Estudios Fiscales, 1991.
- 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.

- Shepsle, Kenneth A. and Barry R. Weingast. "Political Preferences for the Pork Barrel: A Generalization." *Political Preferences for the Pork Barrel: A Generalization*, 1981, 25 (1), pp. 96-111.
- 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, Cecilia, Valentino Larcinse and Leonzio Rizzo. "The Power of the Purse: What do the Data Say on US Federal Budget Allocation to the States?" *Econometric Society 2004 Latin American Meetings 151*, 2004.
- 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, Massachussets: MIT Press, 2002.