ELECTORAL SYSTEMS AND PUBLIC SPENDING

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ABSTRACT

We study the relation between fiscal policy and the degree of proportionality of the electoral system in OECD countries. In particular, we examine whether the strength of the link between representatives and geographically localized interests has an impact on level and composition of spending. We conjecture that representatives with a strong "local" basis are more likely to use provision of (local) public goods, which are easier to target geographically, as a way to enhance their electoral appeal, while representatives elected in broader constituencies or with strong party allegiance are more likely to use transfers for this purpose. Our findings suggest that in countries with more proportional electoral systems, and hence weaker "local" representation in the legislature, both transfers and total government spending tend to be higher.

I. INTRODUCTION

In this paper we study the effects of electoral systems on the size and the composition of public expenditure in OECD countries. In particular, we are interested in studying whether the size and composition of government spending are affected by the degree of "territorial inclusiveness" of the electoral system. Loosely speaking, we define territorial inclusiveness of the electoral system as the strength of the link between representatives and geographically localized interests, or the degree to which representatives are elected on a local rather than national basis. The two hypotheses underlying our study are very simple. With regard to the composition of spending, we argue that if politicians have no well defined geographical constituencies (for example because electoral districts are very large), they may be more likely to seek support by targeting groups that cut across the entire population; this is more effectively achieved through government transfers. For politicians with small geographical constituencies, public investment may instead be an effective way to transfer resources to their electors, because it is the category of public expenditure that is easier to target geographically. Our second hypothesis is that proportional electoral systems may lead to select electoral candidates more prone to spending in view of the likelihood of post-election bargaining, thus leading to higher overall expenditure.

Starting at least with the seminal contribution of Roubini and Sachs (1989), a vast body of theoretical and empirical literature has studied the link between politics, institutions and fiscal outcomes. This literature identifies the critical aspect of an electoral system with its ability to generate strong majority governments. The dichotomy on which political economists build is simple. Majoritarian voting provides voters with clear choices of competing government options prior to elections. By often ensuring single-party majority government, majoritarian systems also produce executive bodies in which economic responsibilities are concentrated in the hands of a small and highly homogeneous number of cabinet officials. This feature is generally associated with sound economic management.

Proportional rules, by contrast, often preclude the formation of clearly identifiable majority coalitions during electoral campaigns, and make government formation a result of complex post-election bargaining. Coalition governments, in turn, may find it difficult to articulate a consistent economic policy and act on the participating parties' electoral promises. While political scientists are divided in their judgement over coalition governments, with some scholars praising proportional rules for their ability to smooth social conflict (Lijphart, 1984), many political economists view such mechanisms as economically inefficient, because of the tendency for inaction that can arise when several decision-makers with veto power have to agree on a single policy course. [1]

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[1] For example, Grilli, Masciandaro and Tabellini (1991) argue that fiscal profligacy in OECD countries is more likely to occur in proportional than in majoritarian electoral systems. Hallerberg and von Hagen (1998) argue instead that the effect of electoral institutions on fiscal policy decisions occurs through their impact on the budget process, rather than directly, and that the most effective way to limit the common pool problem in cabinet negotiations is to entrust power to a strong finance minister, which is likely to be feasible only when there is a single party in power, as typically occurs in plurality systems.

In a recent contribution, Persson and Tabellini (1999a) look more closely into the relation between electoral systems and public spending. In their model of pre-election politics two parties make binding electoral promises concerning the provision of a "universal" public good and district-(group-) specific transfers. When elections are undertaken under a majoritarian system, the objective of each party is to win 50 percent of the districts, while under a proportional system parties aim to win 50 percent of total votes. Elections under a majoritarian system make electoral competition stiffer, with the political struggle centering on key "swing" districts, rather than on those with stronger party allegiance. The result is more targeted redistribution to a narrower constituency, where voters are typically more mobile and "can be easily swayed by electoral promises", identified in their model by the middle class. As a consequence, majoritarian systems should be associated with a lower provision of public goods, that in this model cannot be targeted to specific districts or classes, and larger transfers to the middle class. If taxes are distortionary, the overall size of government would be larger under a majoritarian system, because by focusing on swing electoral districts the parties fail to fully internalize the impact of tax distortions on residents of "safe" districts. In a cross-sectional analysis comprising industrial and developing countries, the authors find inconclusive evidence on the impact of electoral systems on the provision of public goods, and strong evidence that presidential systems are indeed associated with smaller governments.

In this study we also argue that the simple dichotomy adopted in the political economy of electoral systems might be too stylized to capture the channels of influence of electoral institutions on fiscal policy outcomes. In our view, at least two important dimensions are missing from the economic theory of comparative institutions. One is the territorial dimension of voting, referring to what political scientists call the magnitude of electoral districts. Whether legislators are elected in small, geographically identified districts, or rather in large constituencies—possibly embracing the whole electorate—may have an impact on their policy orientation. Adding the geographical dimension would be irrelevant only if small districting was invariably associated with majority rules. But this is not the case. In the mixed-member systems of representation adopted by a growing number of countries, a single-candidate-district mode of election—in which a plurality rule is applied—is often complemented by a second tier of seat allocation. Under this second tier, seats can be attributed to each party list in strict accordance to the share of vote it has received nationwide, thus undoing the over-representation effects implicit in the first tier of single-candidate voting.[2]

The second missing aspect is the degree of control parties exercise over access to their lists by prospective candidates—what Matthew Shugart (1999) has recently termed the "intra-party dimension" of political systems (see also Carey and Shugart, 1995 and Gaviria et al. (1999)). Ballots can turn primarily on collective policy issues only if voters cast party-based votes and elections are not excessively candidate-centered. This, in turn, depends on whether the control

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[2] Germany has been a case of mixed-member representation since the post-World-War-II foundation of the Federal Republic. Shugart (1999) discusses the trend towards adoption of mixed-member electoral systems in New Zealand (following two referenda in 1992 and 1993), Italy (electoral reform of 1993), and Japan.

party leaders exercise on nominations is such to promote partisan allegiance rather than free-lance particularism among nominees. If party leverage is weak, individual legislators have an incentive to pursue "personal" reputations by promoting policies that cater to the small-scale interests of their constituents (as in Japan prior to the recent reform of the electoral system).

Our political data take these aspects into account, thus allowing us to distinguish between different degrees of proportionality in electoral systems and not just between 'proportional' and 'majoritarian' systems. Our results provide support for the hypothesis that less territorially inclusive systems to have higher transfers both in relation to total expenditure and to GDP. In a cross-section of 20 OECD countries, we find strong evidence that countries with larger district magnitude or lower effective thresholds—both proxies for the degree of proportionality of the electoral system—tend to devote a larger share of public expenditure (and of GDP) to transfers. We also find strong evidence that more proportional systems have larger governments (as measured by the ratio of general government expenditure to GDP) even after controlling for the effects of different electoral rules on the number of parties represented in Parliament. Finally, in electoral systems where parties have more control on candidates' lists the share of public investment in total government expenditure tends to be lower.

The rest of the paper is organized as follows. Section II discusses more in detail the hypotheses we test and present a simple model of the size of government spending. Section III describes the data. Section IV presents the empirical analysis, and Section V concludes.

II. THEORETICAL MOTIVATION

To what degree do government spending decisions reflect the incentives set up by the nature of the electoral system? A vast theoretical literature building on the seminal contribution of Weingast, Shepsle and Johansen (1981) has formalized common pool problem arising when the financing of expenditure on local public goods is not fully internalized by legislators.[3] For our purposes, the basic message of this literature is that the amount of pork-barrel projects, defined as public expenditure directed towards specific geographic constituencies, is linked to the degree of "territorial inclusiveness" of the electoral system (see also Lancaster, 1986).

In this study we start from the assumption that certain types of expenditure, in particular the provision of capital goods, are easier to target to a specific geographic constituency than other forms of spending, such as transfers.[4] To put it very simply, from the point of view of a

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[3] Among the more recent contributions, Tornell and Velasco (1992) and Chari and Cole (1995) develop dynamic versions of the common pool problem. Hallerberg (1998) argues that the incentive for a personal vote is stronger in plurality systems, where candidates have a direct link with a local constituency. However, certain types of fiscal institutions, such as the presence of a strong finance minister and a closed rule on the budget (that implies the inability of the legislative branch to change the size of the budget) provide constraints that limit the common pool problem.

[4] Purchase of goods and services can be on the current account, in which case it is called government consumption, or on the capital account, in which case it is called government investment. In turn, government

continued

politician with a local constituency it is more cost-effective to build a road or a bridge in a specific district than to vote for higher transfers which will benefit other districts as well.[5] Other authors, such as Besley and Coate (1999) have also criticized the standard assumption of "universal" public goods, arguing that these often have an important geographical dimension. Our first hypothesis is therefore that, ceteris paribus, the *share* of public expenditure which is devoted to public investment will be higher in electoral systems in which the incentives to cultivate local constituencies are stronger. In contrast, when legislators are elected in large districts, they are more likely to rely on constituencies that cut across the population, without strong geographical concentration. In this case, transfers may be a more effective way to garner political support.

An important issue is whether the degree of territorial inclusiveness of the electoral system has also implications for the *level* of public expenditure, and not only for the relative shares of the different components of public expenditure. Admittedly, with the exception of Persson and Tabellini (1999a), there is very little modeling of this issue; and intuitive arguments could go both ways. On the one hand, the literature on pork-barrel spending may suggest that the common pool problem is going to be more severe when local interests dominate, thus entailing higher spending in more territorially inclusive systems. On the other hand, political candidates in more proportional systems need not fully internalize the link between spending and taxation. For example, transfers to a certain group of supporting constituents may occur without any need for the latter to shoulder any additional tax burden (because they are financed by higher taxes on other interest or income groups). Furthermore, more proportional systems may be more conducive to fragmentation, giving rise to larger and less stable coalitions, and hence to higher government expenditure.

Here we present another, related argument, based on strategic delegation, that leads us to expect larger governments with more proportional electoral systems. The point of the argument is that the higher likelihood of power sharing in more proportional systems encourage the election of delegates with a stronger propensity to spend. For analytical simplicity, we present a simple model proposed by Besley and Coate (1999), with two social (geographical) groups indexed by j=*1,2* that derive utility from two types of public spending. The key assumption concerns the degree of power-sharing under different electoral systems, is initially taken as given in this simple model, but can be obtained as an analytical result in a more complex version of the model which we discuss later. The utility function of a citizen of group *j* takes the form

$$U = (1 - I) \ln x + I[(1 - k) \ln g_j + k \ln g_{-j}] \tag{1}$$

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consumption is divided into the wage component, which in large part is directed towards the purchase of services, and the non-wage component which is largely directed to the purchase of goods.

[5] This is clearly an approximation—for example, a politician can lobby for the hiring of public sector employees in her district.

where x is private consumption, g_j is public expenditure preferred by group j and g_{-j} is public expenditure on the good preferred by the other group. The parameter k measures "spillovers" in the benefits of public goods across social (geographical) groups, and it proxies for the diversity in preferences for different types of public spending across social groups. In each social group, the parameter λ is distributed according to a density function $f(\lambda)$.

Let the two groups be of the same size and let p be the tax paid per unit of public good provided. The overall tax burden is assumed to be borne equally by all citizens in society. A citizen's budget constraint takes the form:

$$x + \frac{p}{2}(g_j + g_{-j}) = y \tag{2}$$

Individual citizens differ in their preferences for consumption of the private vs the public good λ. For simplicity we shall set $p=1$.

Economic policy is decided by the two groups' representatives, with each group electing its own representative. The key issue is the post-election allocation of power between the two representatives. *We associate majoritarian systems with policies being decided by the "minimum winning coalition"*—namely, the representative of the party winning the election decides on fiscal policy. *In contrast, we associate proportional systems with more inclusive power-sharing*, so that economic policy decisions reflect both groups' preferences. Assume, for example, that the preferences of the party/group winning the election have weight μ $(1/2<\mu<1)$ and the preferences of the other group having weight $1-\mu$. Assuming symmetry in the size of groups, the probability of each representative of winning the election is ½ We later discuss how this assumption can be obtained as a result of a more complex version of the model.

In order to solve the problem, we focus first on the second stage, with the preferences of the representative of group j being λ_j. In this case the problem is given by:

$$\max_{\{g_i,g_{-i}\}} \boldsymbol{m}\{(1-\boldsymbol{l}_i)\ln[y-\frac{1}{2}(g_i+g_{-i})]+\boldsymbol{l}_i\ln[(1-k)\ln g_i+k\ln g_{-i}]\}+$$
$$(1-\boldsymbol{m})\{(1-\boldsymbol{l}_{-i})\ln[y-\frac{1}{2}(g_i+g_{-i})]+\boldsymbol{l}_{-i}\ln[(1-k)\ln g_{-i}+k\ln g_i]\} \tag{3}$$

The result of the maximization problem yields

$$\begin{pmatrix} g_1^1 \\ g_2^1 \end{pmatrix} = \begin{pmatrix} 2y[\boldsymbol{ml}_1(1-k)+(1-\boldsymbol{m})\boldsymbol{l}_2 k] \\ 2y[\boldsymbol{ml}_1 k+(1-\boldsymbol{m})\boldsymbol{l}_2(1-k)] \end{pmatrix}$$
$$\begin{pmatrix} g_1^2 \\ g_2^2 \end{pmatrix} = \begin{pmatrix} 2y[(1-\boldsymbol{m})\boldsymbol{l}_1(1-k)+\boldsymbol{ml}_2 k] \\ 2y[(1-\boldsymbol{m})\boldsymbol{l}_1 k+\boldsymbol{ml}_2(1-k)] \end{pmatrix} \tag{4}$$

where the first vector in the equation represents the choice of public goods when the first social group wins the election and the second vector the choice of public goods when the delegate of the second group wins the election.

The first stage consists of the choice of the electoral candidate in each group. As shown by Besley and Coate (1999) the key voter in each group/party is the median voter, and therefore the representative will be chosen so as to maximize the median voter's utility. Assume for simplicity that both social groups are identical and that the median voter's preferences are given by $l = m$. In this case the maximization problem yields the following outcome:

$$l_1 = l_2 = \frac{m}{m + (1-m)s(k, m)} \tag{5}$$

where

$$s(k, m) = \frac{k(1-k)[m^2 + (1-m)^2] + [k^2 + (1-k)^2]m(1-m)}{k(1-k)[m^2 + (1-m)^2] + [k^3 + (1-k)^3]2m(1-m)} \quad if \ (k, m) \neq (0,1) \tag{6}$$
$$s(k, m) = 1 \qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad if \ (k, m) = (0,1)$$

Note that since $\sigma \leq 1$, we have $\lambda_1 = \lambda_2 \geq m$, and therefore both delegates are more prone to public spending than the median voter in each group. The equality holds in 2 extreme cases:

1. k=1/2 (maximum spillovers)
2. μ=1 (minimum winning coalition)

The intuition is straightforward. If both public goods benefit both districts in the same fashion, then there is no reason to appoint strategically a delegate with preferences different from the median voter because the ideal choice of both delegates is the same, and there is no reason to tilt the public consumption profile in favor of one's preferred good. If μ=1 we are back to the minimum winning coalition solution, in which a delegate exerts decision power only if it wins the ballot outright. In this case again there is no reason for strategic delegation. In the more general case, choosing a delegate with a stronger propensity to spend on public goods will imply a larger provision of each group's preferred public good even when their decision power has a lower weight in the overall policy decision. This incentive is strongest when spillovers are very limited, because in that case the other delegate's preferences for public consumption differ by more, and when the legislature is more cooperative (μ=1/2).

How can the assumption concerning power-sharing rules be rationalized? Consider the following extension of the model. There are 3 social groups (A, B and C) of the same size and 3 electoral districts, with different preferences concerning public expenditure.[6] Two groups (A and B) are geographically concentrated while the third is evenly distributed between the 3 districts, so that under a majoritarian system each of the two concentrated groups wins one district with probability 1 while in the third district the electoral outcome is random, with each

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[6] We can either assume that each group has a favorite type of expenditure (thus extending (1)) or that, for example, the two concentrated groups have strong preferences for different public goods ($k=1$), while the dispersed group is indifferent between the two ($k=1/2$).

group having a 1/3 probability of winning. In this case, in a majoritarian system A will be in power with probability 1/3, B with probability 1/3 and a coalition with probability 1/3. Assume for simplicity that all party combinations in the coalition are equally likely.

In a proportional system, all parties win 1/3 of the votes and the outcome is a coalition government with probability 1. Following the line of reasoning of the 2-groups case, the incentive for strategic delegation will be stronger in the case of a proportional system (coalition/power-sharing with probability 1) than in the majoritarian system (single-party governments with probability 2/3 and coalition with probability 1/3).

Thus, our second hypothesis is that the *size* of public expenditure, and in particular of transfers, in relation to GDP, is higher in electoral systems in which the incentives to cultivate local constituencies are weaker. In order to make these hypotheses operational, we need measures of the territorial inclusiveness of the electoral system. We use two classes of measures. The first is related to the notion of *proportionality*, and the second to *the degree of control exercised by parties over the electoral process*.

By their nature, more proportional systems imply a weaker link between a representative and geographically localized interests: in the perfect proportional system, where a single district encompasses the whole country, there is no connection between a specific location and a representative. In measuring proportionality, we want to rely as much as possible on objective, quantifiable measures, rather than qualitative dummy variables. Thus, we use two types of measures of proportionality. The first includes *ex-ante* measures, that capture only the institutional characteristics of the electoral system and are independent of the actual outcome of an election. The average district magnitude is one such measure: political systems with many single-member districts should, ceteris paribus, generate stronger local links for legislators than countries where legislators are elected in a few large districts. The second includes *ex-post* measures of proportionality in the allocation of Parliamentary seats. Typically, these measure how the allocation of seats deviates from the allocation one would have under perfect proportionality. Because there is no unambiguous measure of proportionality, in our empirical investigation we use more than one: we describe them more fully in the data section.

The second class of measures of territorial inclusiveness essentially captures *the degree to which political parties have control on the electoral process*. By its nature, this variable is necessarily more subjective, but we believe it is still useful to investigate its role. As highlighted by Carey and Shugart (1995), this degree of control affects the incentives faced by politicians to campaign on a personal or a party reputation. For the purposes of our study, a measure of this type is of interest for the following reason. Insofar as parties do not represent clearly defined geographical areas, they are more likely to aim at large constituents, rather than local pork-barrel projects. If politicians are elected in small districts but parties have an overwhelming influence on their nomination, their choices are more likely to reflect the party's preferences rather than

maximization of popularity among constituents. [7] Note that, by its nature, this variable is more subjective than the proportionality measures.

There are many other dimensions of electoral systems and institutions that this paper does not investigate. Among them is the distinction between presidential and parliamentary systems (see, for example, Shugart and Carey (1992) and Persson and Tabellini (1999a)). The main reason for this is that in our sample only the United States has a "pure" presidential system, although there are some premier-presidential systems (Austria, Finland, France and Portugal). We also do not address the issue of fiscal federalism, and in particular the degree to which expenditure decisions are taken at a national or state/local level (on the topic, see, for example, Panizza (1999)). This is clearly an important issue on the agenda.

III. THE DATA

Our data set consists of 20 OECD countries, for which homogenous data on the level and composition of public expenditure is available.[8] The budget variables we use come from the OECD Economic Outlook Database, and refer to the general government. We disaggregate total primary expenditure into transfers, wage government consumption, non-wage government consumption, and government investment. [9]

For the electoral variables, we have relied on a variety of sources: in particular, Taagepera and Shugart (1989), Lijphart (1994) and Carey and Shugart (1995). Where possible, we have used these authors' methodology to extend their data. As discussed in the previous section, out primary objective is to obtain measures that capture the degree of proportionality and the degree of party control on the electoral process. To make the reading of the empirical results easier, we will define all variables as *direct* measures of proportionality or party control, which implies that they are inversely related to the degree of territorial inclusiveness. To do so, when necessary we will take the negative of the variable as originally defined, although we will keep the original name. Thus, our hypotheses imply that a higher value of any of these variables should be associated with a higher share of transfers in total government expenditure or a higher share of public spending and transfers in GDP.

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[7] To some extent, the two classes of measures, proportionality and control, are related. For instance, Carey and Shugart (1995) argue that the impact of district magnitude on the incentive to seek personal or party reputation hinges crucially on the degree of party control over their label. If parties do not exercise strong control over access to party lists, intra-party competition may be stronger (and hence the incentive to cultivate a personal reputation stronger) when the district magnitude is larger, because more candidates are competing.

[8] The countries are Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Japan, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom, United States.

[9] This breakdown leaves out subsidies to firms, which are a very small part of total government expenditure and do not exhibit any systematic link with electoral systems, and interest payments.

If all countries had the same population and assembly size, the most direct measure of proportionality would be district magnitude, defined as the average number of representatives elected per district. But the choice of the appropriate district magnitude variable is complicated by the fact that several countries have two-tier electoral systems, in which a certain portion of parliamentary seats are allocated in a second stage in fewer, larger districts (see Taagepera and Shugart (1989) for a discussion of this issue). This second tier typically serves the function of increasing the degree of proportionality in the electoral system, and clearly has an effect on the strength of incentives to cultivate personal reputations with well-defined geographical constituencies.

We have opted for the use of two measures related to district magnitude, which try to correct for the presence of a second tier, and are explained in greater detail in the Appendix. The first, proposed by Taagepera and Shugart (1989), is the "effective district magnitude" (MAGN). For countries with neither legal thresholds for party representation in Parliament nor adjustment seats, MAGN is defined as the ratio of the number of assembly seats to the number of districts. For the remaining countries MAGN is a related to the average size of compensatory districts or to the legal threshold of representation in Parliament (since, with large districts, the latter is equivalent to a reduction in district magnitude). The second measure, also proposed by Taagepera and Shugart (1989) and modified by Lijphart (1994), is (the negative of) the "effective threshold" (THR). This variable is a proxy for the percentage of votes which a party needs to win in order to gain representation in Parliament. For more proportional systems, it is typically equal to the legal threshold of representation. The higher the threshold, the larger are, ceteris paribus, deviations from proportionality.

Even disregarding the issue of two-tier districting, district magnitude would be a full measure of the size of electoral districts if the size of the legislative assembly were proportional to the size of population. However, this is not the case—on average, the size of the assembly increases less than proportionately with population size (see, for example, Taagepera and Shugart (1989)). For this reason, we construct an alternative measure of 'geographical inclusiveness', VOTDIS, which is the product of effective magnitude and the ratio of voting population to assembly seats.[10] This variable captures the notion of voting population per district: a higher value implies a larger constituency for each representative.

We use two ex-post indices of proportionality taken from Lijphart (1994). RAE and LSQ; broadly speaking, these indices measure deviations between the share of votes obtained by parties in elections and their share of seats in Parliament. The first, originally proposed by Rae (1967) tends to understate the degree of disproportionality in systems with many small parties. The second, proposed by Gallagher (1991), gives more weight to large than to small deviations between seat and vote percentages. These variables, which are highly correlated, are available election by election. They are standard in the political science literature, and generally speaking measure the deviation of the allocation of parliamentary seats from a hypothetical situation of

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[10] We approximate the size of the voting population with the total population over 14 years of age.

perfect proportionality. In keeping with our policy of using direct measures of proportionality, we will use the negative of these variables.

In order to control for the effects of ex-post party fragmentation on fiscal policy outcomes, we make use of two indices of party fragmentation, the effective number of elective parties (ENEP) and the effective number of parliamentary parties (ENPP). The first measures the degree of fragmentation in voting outcomes, and the second the degree of fragmentation in seat representation. Both variables change every time there is an election. Finally, regarding our second class of electoral measures, the degree of party control over electoral lists, we use a dichotomous dummy variable, CONTR, which is constructed following Carey and Shugart (1995). This variable takes the value 0 when there is weak party control on electoral lists (implying either that voters can "disturb" party ballots or that party leaders do not control access to ballots' rank) and 1 when there is strong party control (leaders present a fixed ballot and voters cannot 'disturb' the list).

The data Appendix presents the exact definitions, sources, and some descriptive statistics on all these variables. For most countries, the fiscal and political variables start in 1960 or slightly later; but the electoral data for Greece, Portugal and Spain start in the mid-seventies, i.e. the time when they became democracies.

IV. EMPIRICAL RESULTS

Electoral systems change very infrequently; in fact, for several countries in our sample, the variables MAGN, THR, VOTDIS, and CONTR show no time series variation at all.[11] This is an advantage and a disadvantage for our empirical analysis of the effects of electoral systems on fiscal policy. The advantage is that the problem of joint endogeneity of institutions and fiscal outcomes, which has constantly plagued the empirical literature, is mitigated, albeit not eliminated.[12] The disadvantage is that one cannot separate electoral institutions from other time-invariant country characteristics that can affect fiscal outcomes.[13] Thus, we start the empirical analysis with cross-sectional evidence, and then move to panel regressions whenever possible.

IV.1 Cross-section regressions
Even among the relatively small group of OECD countries in our sample, there are large cross-country differences in both the level and the composition of public expenditure. In the scatter diagrams presented in Figures 1-16 these differences are related to various features of the

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[11] The variable VOTDIS does show year-to-year variation, but only because it is constructed as the product of MAGN and the ratio of the voting population to total assembly seats; most of the time variation comes from the second variable.

[12] In principle, one could imagine that countries where the electorate favors, say, lower public spending might choose a less proportional electoral system.

[13] That is, we cannot separately identify the effects of electoral systems in a fixed-effects panel regression.

electoral system: effective magnitude, effective threshold, and voting population per district, as well as to the degree of proportionality LSQ. The most striking empirical regularity is the strong positive correlation of district magnitude and of effective threshold with the share of transfers in GDP and in total expenditure.

While interesting, these scatter diagrams by their nature only display bivariate relationships in the nature of simple correlations. But the results of the scatter diagrams are strengthened when we add other controls to our simple cross-sectional regressions. In Tables 1 and 2 we estimate cross section regressions of the type:

$$G(j,i) = c + \alpha X(i) + \beta \, POP65(i) + \gamma \, GDP(i) + \varepsilon(i) \qquad (7)$$

where all variables are expressed as country-specific averages over the relevant period. In equation (7), $G(j,i)$ is the average share of expenditure type j in total expenditure for country i: thus, Tables 1 and 2 are directly relevant for a test of our first hypothesis.[14] As discussed in section 3, we consider four types of expenditures: transfers to households, the wage and non-wage components of government consumption, and public investment.[15] $X(i)$ is an electoral system variable: also as discussed in section 3, we consider the variables MAGN, THR, VOTDIS, RAE, LSQ, and CONTR. $POP65(i)$ is the share of population over 65, a potentially important determinant of the size of transfer expenditure, and $GDP(i)$ is the PPP adjusted per capita income of the country, in logs of thousands of dollars, to capture possible Wagner Law-type effects.

The difference between the two tables is in the sample over which we compute the average values of the variables. In Table 1, the sample is the longest one, usually from the early sixties to 1992 or later for some countries. In Table 2, the sample starts in 1975, on the ground that for many countries the early part of the sample was a period of adjustment towards their (collectively) preferred size and allocation of total expenditure,[16] and that for Greece, Portugal and Spain data on the electoral system start in the mid-seventies.

Starting with Table 1, in columns (1) and (3) MAGN and VOTDIS have a positive and significant coefficient; the coefficient of THR in column (2) is also positive, although not significant. The magnitude of the coefficients is non negligible; for instance, from column (1) an

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[14] In these and all the following tables all budget variables, which are always expressed as ratios of either total expenditure or GDP, are multiplied by 100; thus, all coefficients represent the percentage points of its denominator by which the budget variable changes in response to a unit change in the independent variable.

[15] In these and all the following tables all budget variables, which are always expressed as ratios of either total expenditure or GDP, are multiplied by 100; thus, all coefficients represent the percentage points of its denominator by which the budget variable changes in response to a unit change in the independent variable.

[16] For instance, Italy started in 1960 with the same total share of government expenditure in GDP as the United States--about 26 percent--but ended in 1993 with a much higher share--44 against 33 percent.

increase in the average size of the district by 1 representative is associated with an increase in the share of transfers in total expenditure by .14 percentage points, ceteris paribus. The point estimates of our ex-post measures of proportionality, RAE and LSQ, are consistent with our hypothesis, but far from significant at conventional confidence levels. Note, however, that the coefficients of the same variables are negative and significant in a regression with the purchase of goods (as a share of total expenditure) as the dependent variable (not shown). The same is true for the second type of measure of territorial inclusiveness, CONTR. Note also that, consistent with the theory, the coefficient of the proxy for the dependency ratio, POP65, is always positive and significant. Results are even stronger in the shorter, post-1974 sample of Table 2.

Tables 3 and 4 display estimates of regressions like equation (1), but with the budget variables G(j,i) expressed as shares of GDP instead of shares of total spending. Thus, these tables test our second hypothesis; and the results are indeed considerably stronger than in the previous two tables. Again starting with the whole sample (Table 3), all ex-ante measures of proportionality-- MAGN, THR, and VOTDIS-- now have positive and significant coefficients (at the 5 or 10 percent level), both in the regressions for total expenditure (columns 1, 3, and 5) and in those for transfers. Again, the quantitative effects of electoral systems implied by these estimates are significant: for instance, an increase in the district size by one representative is associated with a higher of size of the general government budget by .15 percentage points of GDP, of which .12 percentage points are explained by the increase in the share of transfers in GDP. Given a standard deviation of MAGN of 16.6 and a range of 75, these are clearly non-negligible effects. Both ex-post measures of proportionality have always a positive coefficients, and RAE now has significant coefficients (at the 10 percent level) in both regressions. CONTR is now significant in the total expenditure regression.

Much the same picture emerges from the post-1974 regressions of Table 4. The main differences are the slightly smaller t-statistics on VOTDIS and CONTR, and the considerably stronger role of LSQ, whose coefficient is now significant in both the total expenditure and transfer regressions.

By comparing the estimated coefficients of the electoral variable in the total expenditure and transfer regressions, it is immediately apparent that much of the effect of the electoral variable on total expenditure operates through the effects on transfers: in fact, we almost never find statistically significant coefficients of the electoral variables in the regressions for the other components of expenditure. The very few exceptions concern the government investment equations, in which the electoral variables sometimes exhibit a positive and significant coefficient (at the 10 percent level).

Especially considering the paucity of degrees of freedom, we interpret our results so far as highly supportive of both our hypotheses. From Tables 1 and 2, countries with more proportional systems tend to have a larger share of transfers in total expenditure. From Tables 3 and 4, the share of total government expenditure, and in particular of transfers, in GDP is larger in countries with more proportional systems. These findings appear to contradict the notion that

plurality systems (with low district magnitude) are more prone to use transfers because they imply stiffer competition for 'swing' votes (see Persson and Tabellini (1999a)).

Conventional wisdom has it that proportional systems tend to be associated with a larger number of parties in Parliament and with larger coalition governments. In turn, larger coalitions tend to be associated with more expenditure, particularly on transfers (see Perotti and Kontopoulos 1998). Hence, the natural question arises: how much of our results so far capture this association between electoral systems and coalition size? To answer this question, we have included the average effective number of elective parties, ENEP (results are analogous when we use the effective number of parliamentary parties, ENPP). The results are in Tables 5 and 6, which correspond to Tables 1 and 3 respectively (for brevity we omit the same regressions on the shorter sample; however, the results would be stronger).

In Table 5 (where all budget variables are measured as shares of total expenditure) the inclusion of ENEP usually causes the coefficients of the electoral variables to fall somewhat, and only the coefficient of VOTDIS remains significant.[17] In contrast, in Table 6 (where all budget variables are measured as shares of GDP), the inclusion of ENEP leaves the coefficients of the electoral variables virtually unchanged. In fact, if anything they become more significant: for instance, now even the coefficients of CONTR are significant in both the transfer and total expenditure regressions. We conclude that the electoral system has an effect on fiscal outcomes independent of its effects on the degree of party fractionalization both in elections and in Parliamentary representation.

IV.2 Two-stage panel regressions.

Because all electoral measures used in the previous regressions display limited or no time variation, we could not run panel regressions with fixed effects because the electoral variables would not be separately identified. Thus, we adopt the following strategy, following Bohn and Inman (1996): in the first stage, we run a fixed effect panel regression as specified in the following equation:

$$G(j,i,t) = c(i) + \alpha\, G(j,i,t\text{-}1) + \beta\, DU(i,t) + \gamma\, DGR\,(i,t) + \delta\, INFL(i,t) + \qquad (8)$$
$$\lambda\, POP65(i,t) + \mu\, GDPPC\,(i,t) + \varepsilon(i,t)$$

In equation (8), i indexes the country, t the year, and j the budget variable. The first line in equation (8) includes very standard controls in the literature; in fact, these are exactly the same list of variables used, for example, by Roubini and Sachs (1989); thus, c(i) represents country-specific constants; G(j,i,t-1) is the lagged budget variable, to account for the high persistence of the data;[18] DU(i,t) is the change in unemployment, DGR(i,t) is the change in the rate of growth

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[17] Note, however, that on the post-1974 sample the coefficient of MAGN remains highly significant.

[18] Note that, because in our set up it is T (the number of years) that goes to infinity asymptotically; thus, even if we have a lagged dependent variable in our panel regressions, the estimated coefficients are consistent; since T is relatively large (between 30 and 35 years for most countries) the bias is also likely to be small.

of GDP, and INFL(i,t) is the inflation rate. To this list of variables, for consistency with our previous results we have added POP65(i,t) - the share of population over 65 years of age -- and GDPPC (i,t)-- the log of GDP per capita. [19]

In the second stage, we regress the estimated country fixed effects on the electoral system variables that exhibit no or minimal time variation, namely MAGN, THR, VOTDIS, and CONTR. The results of the second stage, cross-section regressions are displayed in Tables 5 and 6, which parallel Tables 1 and 3, respectively (for brevity, we do not display results when the panel regressions are estimated over the shorter, post-1974 sample). The results are entirely consistent with the cross-section regressions in Tables 1 and 3. Even after partialling out the effects of variables like the change in unemployment, the change in growth, and inflation, there is still a robust positive correlation between the degree of proportionality and the share of transfers in total spending (Table 7) or the share of spending and transfers in GDP (Table 8).

In Table 7, all three measures of proportionality, MAGN, THR, and VOTDIS, have a positive coefficient in the second stage regression, with a significance level always below 5%. Despite appearances, the magnitude of the estimated coefficients is also comparable to those of Table 1. For instance, in Table 7 an increase in effective district magnitude by one representative is associated with a higher steady state share of transfers in total expenditure by .19 percentage points (the ratio of the estimated coefficient of MAGN in column 1 of Table 7 to 1-.82, where .82 is the estimated coefficient of the first lag of transfers in the first stage panel regression, equation (2)). This figure is comparable to the value of .14 for the estimated coefficient of TRAN in column 1 of Table 1. As in Table 1, the coefficient of the fourth variable, CONTR, is positive but insignificant (but, consistent with the theory, it is negative and significant in the regression for the purchase of good and services, not shown)

Similar conclusions hold for Table 8, where all expenditure variables are expressed in shares of GDP. Here also MAGN, THR and VOTDIS have positive and significant (at the 5 or 10 percent level) in both the total expenditure and transfer regressions. Once again, the estimated effects are comparable to those in Table 3. From columns 1 and 2 of Table 8, an increase in effective district magnitude by 1 representative is associated with a steady state increase in the share of total expenditure in GDP by about .19 percentage points (.19 = .023/(1-.88), where .023 is the estimated coefficient of MAGN in the second stage regression and .88 is the estimated coefficient of the first lag of total expenditure in the first stage panel regression) almost all of which is explained by the steady-state increase in transfers of .17 percentage points (.17 = .015/(1-.91)). These figures are not too different from the estimated coefficients of MAGN in columns 1 and 2 of Table 2, .15 and .12 respectively. Note that now CONTR, our proxy for the degree of party control on party ballots, has a significant positive coefficient in the total expenditure regression.

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[19] When we include also a full set of year dummies, to account for possible common shocks across countries, the results are very similar.

IV.3 Panel regressions with interactive terms.

We now ask the question: do electoral systems matter more under some circumstances than others? It is plausible to expect that electoral systems, and institutions in general, should have a larger impact on fiscal outcomes in "difficult" times than in "normal" circumstances.[20] To explore this idea, we run panel regressions like (2), with the addition of an interactive term $X(i,t)*DGR(i,t)$, where $X(i,t)$ is the electoral variable whose effect we are studying. Thus, implicitly we are defining "difficult times" as country-years during which DGR is particularly low. Hence, if institutions matter more under difficult times, we should expect the coefficient of the interactive term to be *negative*: in difficult times (negative values of DGR), total expenditure and transfers should increase more the more proportional the electoral system is (the higher the value of MAGN, THR, VOTDIS, RAE, LSQ), or the more control parties have over party lists (the higher the value of CONTR).

Table 9 reports the results from these regressions. The dependent variables are expenditure and transfers as shares of GDP,[21] and for brevity we only present results over the full sample. As one can see, the coefficients of the interactions of MAGN, THR, and VOTDIS with DGR are all negative and significant in both the total expenditure and transfer regressions. Thus, from column (2), when the rate of growth is falling by 1 percentage point, total expenditure and transfers increase by .02 percentage points *more* for every extra candidate that is elected in each district. Once again, this number must be set against a standard deviation and a range of MAGN of 16.6 and 75, respectively. Finally, we do not find any important interactive effect of CONTR with the change in growth.

Because RAE and LSQ display time series variation, we can also include the variable by itself, in addition to the its interaction with DGR. We expect the coefficient of the variable by itself to be positive, and that of its interaction to be negative. The point estimates in Table 9 are all consistent with this hypothesis; all interactive terms, with the exception of LSQ in the total expenditure regression, are significant. Overall, we believe these results offer considerable support for the notion that electoral institutions are particularly important determinants of fiscal outcomes in difficult times.

V. CONCLUDING REMARKS

We have presented evidence that in OECD countries the nature of the electoral system has important effects on the level and the composition of public expenditure. In particular, we find that transfers tend to be higher, both as a share of total expenditure and as a share of GDP, in countries with more proportional electoral systems. These results are robust across different

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[20] This idea, although in a different context, has been formalized, among others, by Drazen and Grilli (1993) and by Spolaore (1993).

[21] When the dependent variable is defined in share of total expenditure, we do not find any significant incremental effect of electoral institutions in difficult times.

definitions of proportionality and the degree of local representation, and are consistent with the hypothesis that in more proportional systems politicians target interest groups that cut across the entire population, rather than geographically well defined constituencies, and find that transfers are more effective in this regard. We also find strong support for the notion that government expenditure is higher in more proportional systems, even after controlling for the number of parties in Parliament, and we have proposed a simple model based on strategic delegation that yields this prediction. We find weaker support for the notion that parties' control over access to ballots is correlated with the level and composition of public expenditure.

APPENDIX: Data sources and definitions

Fiscal variables

EXP total primary government expenditure, general government. Source: OECD Economic Outlook Database.

TRAN transfers to households, general government. Source: OECD Economic Outlook Database.

Political variables

MAGN Effective district magnitude. Let D_1 (D_2) be the number of first-tier (second-tier) districts and S the number of seats in the lower chamber of Parliament. For countries with neither legal thresholds for party representation in Parliament nor adjustment seats (ie, with single-tier districting), effective magnitude is defined as $MAGN = S / D_1$. For the other countries, the calculation proceeds in two stages. The first consists in the calculation of an adjusted magnitude $AM = S / D_2$ under the assumption that these districts are sufficient to compensate for deviations from proportionality in the first stage. If there is no legal threshold to representation in Parliament, $MAGN=AM$. If instead there is a legal threshold T (a minimum percentage or number of votes necessary to elect a representative) to either nationwide allocation of seats or to participation in the allocation of compensatory seats, effective magnitude is given by Min (S / D_1, $1/2T$) for countries with single-tier districting and Min (S / D_2, $1/2T$) for countries with remainder or compensatory seats. Source: Taagepera and Shugart (1989), extended to the late 1980s and early 1990s following their methodology.

THR (-) Effective threshold. THR is defined as the maximum between two variables: the legal threshold of representation T, if any, and the mean between the minimum percentage of votes needed to gain representation and the maximum number of votes that can still deny representation, X. The higher the threshold, the larger are, ceteris paribus, deviations from proportionality. Taagepera and Shugart (1989) define $X=1/2M$, where M is average district magnitude. Lijphart (1994) instead approximates the upper threshold of representation with $1/(M+1)$ and the lower one with $(1/2M)$. Hence he defines $X=1/2 [1/(M+1)+ 1/2M]$. This formula does not work well for plurality/majority systems, for which it implies a threshold of 50%. For those systems, Lijphart uses an effective threshold of 35%. Complications arise in defining THR in electoral systems with adjustment seats and no or complex legal thresholds: see Lijphart (1994), chapter 2 for a detailed discussion for how the threshold is calculated in these cases. Source: Lijphart (1994) and extensions for the early 1990s following his methodology.

VOTDIS Voting population per (adjusted) district. The variable is calculated as the product of MAGN and the ratio of voting population (proxied by the population over 14 years of age) to the size of the legislative assembly. Sources: Lijphart (1994) and MacKie and Rose (1991).

RAE (-) Index of disproportionality proposed by Rae (1967). $RAE = 1/n\ \mathbf{S}_j\ |s_j - v_j|$ where n is the number of parties competing in the election, s_j is the share of seats of party j and v_j is the share of votes of party j. Source: Lijphart (1994) and unpublished data from Lijphart.

LSQ (-) Index of disproportionality proposed by Gallagher (1991). $LSQ = [1/2\ \mathbf{S}_j\ (s_j - v_j)^2]^{1/2}$ where s_j is the share of seats of party j and v_j is the share of votes of party j. Source: Lijphart (1994) and unpublished data from Lijphart.

ENEP Effective number of elective parties. $ENEP = \mathbf{S}_j\ 1/v_j^2$, where v_j is the share of votes of party j. Source: Lijphart (1994) and unpublished data from Lijphart.

ENPP Effective number of Parliamentary parties. $ENPP = \mathbf{S}_j\ 1/s_j^2$, where s_j is the share of seats of party j. Source: Lijphart (1994) and unpublished data from Lijphart.

CONTR Dummy variable taking the value of 1 if parties exercise strong control over electoral ballot lists (leaders present a fixed ballot and voters cannot 'disturb' the list) and 0 otherwise (parties do not control access to ballots' rank and/or voters can 'disturb' list). The primary source for this variable is Carey and Shugart (1995), and we have classified the countries not covered in their study. The overall classification is: Austria, Belgium, Canada, Denmark, France, Germany, Greece, Italy, Netherlands, Norway, Portugal, Spain, Sweden and United Kingdom as 1 and Australia, Finland, Ireland, Japan, Switzerland and US as 0.

Other variables

POP65 Ratio of population above 65 to total population. Source: World Bank, World Development Indicators.

GDPPC Log of GDP per capita. Source: Summers and Heston (1991).

APPENDIX: Summary statistics

	Mean	St. dev.	Min.	Max.
MAGN	11.83	16.65	1.00	75.00
THR	-14.84	-13.22	-35.00	-0.67
VOTDIS	0.66	1.20	0.04	6.31
CONTR	-0.32	0.47	-1.00	0.00
RAE	-2.57	2.34	-12.26	-0.15
LSQ	-5.45	4.62	-21.22	-0.41
ENEP	3.88	1.37	1.97	9.01
ENPP	3.33	1.25	1.54	7.62
Exp	36.14	9.53	15.92	65.63
Tran	14.01	5.84	3.29	29.28
Gdppc	9.10	0.42	7.53	9.80
Poprat65	12.36	2.76	5.74	19.88

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TABLE 1. Electoral system and share of tranfers in total expenditure*
Full sample

Dep. Var.	(1) Tran	(2) Tran	(3) Tran	(4) Tran	(5) Tran	(6) Tran
MAGN	0.139 (1.91)*					
THR		0.152 (1.38)				
VOTDIS			2.496 (2.51)**			
RAE				0.937 (1.39)		
LSQ					0.183 (0.53)	
CONTR						1.893 (0.55)
Pop65	1.129 (2.15)**	0.785 (1.31)	1.303 (2.65)**	0.849 (1.42)	1.079 (1.79)*	0.962 (1.39)
Gdppc	-3.078 (-0.75)	-1.089 (-0.22)	-3.545 (-0.84)	-1.508 (-0.31)	-2.921 (-0.58)	-2.468 (-0.49)
R^2	0.23	0.16	0.33	0.16	0.08	0.09
Nobs	20	20	20	20	20	20

Dependent variable is the share of transfers in total public expenditure. Ordinary least squares, with t-statistics in parenthesis. '*': significant at the 10 percent level; '**': significant at the 5 percent level. Variables are averages over the whole sample period. See Appendix for definition of variables.

TABLE 2. Electoral system and share of transfers in total expenditure
1975-1991

	(1)	(2)	(3)	(4)	(5)	(6)
Dep. Var.	**Tran**	**Tran**	**Tran**	**Tran**	**Tran**	**Tran**
MAGN	0.18 *(2.56)***					
THR		0.19 *(1.60)*				
VOTDIS			2.83 *(3.26)***			
RAE				1.28 *(2.07)**		
LSQ					0.47 *(1.53)*	
CONTR						0.36 *(0.10)*
Pop65	0.69 *(1.37)*	0.29 *(0.45)*	0.94 *(2.02)**	0.27 *(0.46)*	0.51 *(0.85)*	0.78 *(1.09)*
Gdppc	-0.80 *(-0.20)*	1.97 *(0.41)*	-1.77 *(-0.47)*	1.39 *(0.31)*	-0.48 *(-0.11)*	-0.64 *(-0.13)*
R^2	0.24	0.08	0.36	0.15	0.07	-0.06
Nobs	20	20	20	20	20	20

Dependent variable is the share of transfers in total public expenditure. Ordinary least squares, with t-statistics in parenthesis. Variables are averages over the period 1975-91. See Appendix for the definition of variables.

TABLE 3. Electoral system and size of expenditure
Full sample

	(1)	(2)	(3)	(4)	(5)	(6)
	Exp	Tran	Exp	Tran	Exp	Tran
MAGN	0.150	0.119				
	(3.07)**	(3.81)**				
THR			0.148	0.109		
			(1.79)*	(1.97)*		
VOTDIS					1.817	1.780
					(2.39)**	(4.10)**
Pop65	2.087	1.149	1.737	0.898	2.158	1.247
	(5.95)**	(5.07)**	(3.87)**	(2.95)**	(5.72)**	(5.71)**
Gdppc	3.194	0.186	4.713	1.403	1.995	-0.503
	(1.17)	(0.11)	(1.27)	(0.56)	(0.61)	(-0.27)
R^2	0.71	0.67	0.59	0.49	0.64	0.69
Nobs	20	20	20	20	20	20

TABLE 3, CONT'D

	(7)	(8)	(9)	(10)	(11)	(12)
	Exp	Tran	Exp	Tran	Exp	Tran
RAE	0.966	0.684				
	(2.06)*	(2.06)*				
LSQ			0.339	0.188		
			(1.40)	(1.08)		
CONTR					4.627	1.92
					(1.98)*	(1.06)
Pop65	1.712	0.916	1.875	1.055	1.507	1.005
	(4.11)**	(3.06)**	(4.41)**	(3.37)**	(3.17)**	(2.87)**
Gdppc	3.590	0.869	2.229	-0.152	3.611	2.35
	(1.06)	(0.35)	(0.63)	(-0.06)	(1.05)	(1.32)
R^2	0.61	0.49	0.56	0.40	0.61	0.54
Nobs	20	20	20	20	20	20

Dependent variable is the share of total public expenditure in GDP (regressions (1), (3), (5), (7), (9), (11)) and the share of transfers in GDP (regressions (2), (4), (6), (8), (10), (12)). Ordinary least squares, with t-statistics in parenthesis. Variables are averages over the whole sample period. See Appendix for the definition of explanatory variables.

TABLE 4. Electoral system and size of expenditure
1975-1991

	(1)	(2)	(3)	(4)	(5)	(6)
	Exp	Tran	Exp	Tran	Exp	Tran
MAGN	0.210	0.170				
	(3.53)**	(4.56)**				
THR			0.212	0.156		
			(2.00)*	(2.08)*		
VOTDIS					2.246	2.224
					(2.54)**	(4.49)**
Pop65	2.234	1.174	1.785	0.853	2.465	1.383
	(5.33)**	(4.49)**	(3.12)**	(2.12)*	(5.23)**	(5.22)**
Gdppc	3.220	1.178	6.337	3.459	2.495	0.445
	(0.96)	(0.56)	(1.46)	(1.13)	(0.66)	(0.21)
R^2	0.70	0.69	0.57	0.44	0.62	0.69
Nobs	20	20	20	20	20	20

TABLE 4, CONT'D

	(7)	(8)	(9)	(10)	(11)	(12)
	Exp	Tran	Exp	Tran	Exp	Tran
RAE	1.372	1.037				
	(2.51)**	(2.71)**				
LSQ			0.545	0.396		
			(2.01)*	(2.04)*		
CONTR					4.677	2.215
					(1.47)	(0.95)
Pop65	1.780	0.841	2.005	1.022	1.792	1.018
	(3.42)**	(2.31)**	(3.83)**	(2.74)**	(2.85)**	(2.21)**
Gdppc	5.312	2.841	3.352	1.346	5.395	2.213
	(1.36)	(1.04)	(0.84)	(0.47)	(1.21)	(0.67)
R^2	0.62	0.51	0.57	0.44	0.52	0.34
Nobs	20	20	20	20	20	20

Dependent variable is the share of total public expenditure in GDP (regressions (1), (3), (5), (7), (9), (11)) and the share of transfers in GDP (regressions (2), (4), (6), (8), (10), (12)). Ordinary least squares, with t-statistics in parenthesis. Variables are averages over the period 1975-91. See Appendix for the definition of explanatory variables.

TABLE 5. Electoral system, party fragmentation and composition of public expenditure

	(1)	(2)	(3)	(4)	(5)	(6)
	Tran	**Tran**	**Tran**	**Tran**	**Tran**	**Tran**
MAGN	0.099 *(1.28)*					
THR		0.067 *(0.54)*				
VOTDIS			2.104 *(2.14)***			
RAE				0.361 *(0.45)*		
LSQ					-0.004 *(-0.01)*	
CONTR						2.857 *(0.91)*
ENEP	1.495 *(1.33)*	1.676 *(1.37)*	1.522 *(1.56)*	1.693 *(1.29)*	2.031 *(1.76)**	2.250 *(2.12)**
Pop65	0.895 *(1.65)*	0.719 *(1.23)*	1.046 *(2.09)**	0.790 *(1.34)*	0.864 *(1.49)*	0.502 *(0.76)*
Gdppc	-3.745 *(-0.93)*	-3.255 *(-0.64)*	-4.281 *(-1.05)*	-3.291 *(-0.66)*	-4.052 *(-0.85)*	-3.355 *(-0.73)*
R^2	0.27	0.21	0.38	0.20	0.19	0.25
Nobs	20	20	20	20	20	20

Dependent variable is the share of transfers in total public expenditure. Ordinary least squares, with t-statistics in parenthesis. Variables are averages over the available sample period (1960-1994 for the fiscal variables, 1960-1992 for political variables). See Appendix for definition of variables.

TABLE 6. Electoral system, party fragmentation and size of public expenditure

	(1)	(2)	(3)	(4)	(5)	(6)
	Exp	Tran	Exp	Tran	Exp	Tran
MAGN	0.156	0.105				
	(2.87)**	(3.12)**				
THR			0.145	0.070		
			(1.47)	(1.13)		
VOTDIS					1.750	1.596
					(2.16)**	(3.77)**
ENEP	-0.245	0.516	0.064	0.789	0.259	0.726
	(-0.31)	(1.06)	(0.07)	(1.29)	(0.32)	(1.73)
Pop65	2.125	1.067	1.735	0.861	2.114	1.122
	(5.56)**	(4.47)**	(3.73)**	(2.87)**	(5.14)**	(5.15)**
Gdppc	3.303	-0.041	4.631	0.411	1.869	-0.853
	(1.16)	(-0.02)	(1.15)	(0.16)	(0.56)	(-0.48)
R^2	0.69	0.67	0.56	0.51	0.62	0.72
No. obs	20	20	20	20	20	20

	(7)	(8)	(9)	(10)	(11)	(12)
	Exp	Tran	Exp	Tran	Exp	Tran
RAE	1.084	0.462				
	(1.86)*	(1.17)				
LSQ			0.309	0.104		
			(1.18)	(0.61)		
CONTR					5.052	2.867
					(2.18)**	(1.90)*
ENEP	-0.346	0.674	0.330	0.988	0.992	1.303
	(-0.36)	(1.03)	(0.37)	(1.67)	(1.26)	(2.56)**
Pop65	1.724	0.887	1.840	0.944	1.304	0.616
	(4.01)**	(2.96)**	(4.12)**	(3.10)**	(2.64)**	(1.90)*
Gdppc	3.954	0.172	2.045	-0.685	3.220	0.049
	(1.09)	(0.07)	(0.56)	(-0.28)	(0.95)	(0.02)
R^2	0.59	0.49	0.54	0.46	0.62	0.58
No. obs	20	20	20	20	20	20

Dependent variable is the share of total public expenditure in GDP (regressions (1), (3), (5), (7), (9), (11)) and the share of transfers in GDP (regressions (2), (4), (6), (8), (10), (12)). Ordinary least squares, with t-statistics in parenthesis. Variables are averages over the whole sample period. See Appendix for the definition of explanatory variables.

TABLE 7. Electoral system and composition of public expenditure
Two-stage panel regressions

	(1)	(2)	(3)	(4)
	Tran	Tran	Tran	Tran
MAGN	0.030 *(1.80)**			
THR		0.042 *(2.06)**		
VOTDIS			0.462 *(2.00)**	
CONTR				0.567 *(0.93)*
R²	0.11	0.15	0.14	-0.01
No. obs	20	20	20	20

Dependent variable is the estimated fixed country effect from the first-stage panel regression of the share of transfers in total expenditure on a set of explanatory variables including the lagged dependent variable, share of population over 65, inflation, change in GDP growth, the change in unemployment and the log of GDP per capita (see the text for details). Ordinary least squares, t-statistics in parenthesis.

TABLE 8. Electoral system and size of public expenditure
Two-stage panel regressions

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Exp	Tran	Exp	Tran	Exp	Tran	Exp	Tran
MAGN	0.0263 *(3.67)***	0.0162 *(4.83)***						
THR			0.0249 *(2.40)***	0.0137 *(2.48)***				
VOTDIS					0.2723 *(2.29)***	0.2150 *(4.18)***		
CONTR							0.4922 *(1.60)*	0.1610 *(0.94)*
R²	0.40	0.54	0.20	0.21	0.18	0.46	0.08	-0.01
No. obs	20	20	20	20	20	20	20	20

Dependent variable is the estimated fixed country effect from the first-stage panel regression of the share of total expenditure in GDP (regressions (1), (3), (5), (7)) and of the share of transfers in GDP (regressions (2), (4), (6), (8)) on a set of explanatory variables including lagged dependent variable, share of population over 65, inflation, change in GDP growth, change in unemployment and the log of GDP per capita (see the text for details). Ordinary least squares, t-statistics in parenthesis.

TABLE 9. Electoral systems and composition of public expenditure
Panel regressions with interactive terms

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Exp	**Tran**	**Exp**	**Tran**	**Exp**	**Tran**	**Exp**	**Tran**
MAGN*DGR	-0.024 *(-1.88)**	-0.020 *(-3.73)***						
THR*DGR			-0.029 *(-2.17)***	-0.020 *(-3.54)***				
VOTDIS*DGR					-0.342 *(-1.68)**	-0.287 *(-3.41)***		
CONTR*DGR							-0.097 *(-0.27)*	-0.046 *(-0.31)*
Lagged elect	0.862 *(50.41)***	0.905 *(75.84)***	0.855 *(48.27)***	0.900 *(73.10)***	0.860 *(48.59)***	0.902 *(73.33)***	0.862 *(49.04)***	0.902 *(72.74)***
DU	0.894 *(12.58)***	0.549 *(18.73)***	0.898 *(12.52)***	0.550 *(18.62)***	0.891 *(12.35)***	0.547 *(18.53)***	0.890 *(12.41)***	0.550 *(18.48)***
DGR	-0.896 *(-4.09)***	-0.208 *(-2.29)***	-1.605 *(-6.03)***	-0.711 *(-6.45)***	-0.978 *(-4.63)***	-0.269 *(-3.12)***	-1.200 *(-5.25)***	-0.435 *(-4.59)***
INFL	-0.014 *(-0.84)*	-0.025 *(-3.64)***	-0.012 *(-0.65)*	-0.023 *(-3.14)***	-0.011 *(-0.60)*	-0.022 *(-3.04)***	-0.012 *(-0.70)*	-0.024 *(-3.17)***
Pop65	0.260 *(2.87)***	0.141 *(3.83)***	0.259 *(2.81)***	0.140 *(3.73)***	0.260 *(2.79)***	0.140 *(3.76)***	0.264 *(2.85)***	0.146 *(3.87)***
Gdppc	0.504 *(0.97)*	0.347 *(1.55)*	0.632 *(1.19)*	0.454 *(1.99)***	0.557 *(1.05)*	0.427 *(1.87)**	0.500 *(0.95)*	0.404 *(1.76)**
R²	0.98	0.99	0.97	0.99	0.97	0.99	0.97	0.99
No. obs	573	576	559	562	560	563	567	570

Panel regressions with fixed country effects, t-statistics in parenthesis. Dependent variables are the share of public expenditure in GDP (regressions (1), (3), (5), (7)) and the share of transfers in GDP (regressions (2), (4), (6), (8)).

TABLE 9, CON'D

	(9)	**(10)**	**(11)**	**(12)**
	Exp	**Tran**	**Exp**	**Tran**
RAE	0.035	0.012		
	(0.63)	*(0.50)*		
RAE*DGR	-0.148	-0.084		
	*(-2.03)**￼	*(-2.80)**￼		
LSQ			0.021	0.006
			(0.79)	*(0.53)*
LSQ*DGR			-0.059	-0.039
			(-1.49)	*(-2.40)**￼
Lagged elect	0.857	0.901	0.856	0.900
	*(48.39)**￼	*(73.82)**￼	*(48.09)**￼	*(73.37)**￼
DU	0.804	0.487	0.803	0.486
	*(10.36)**￼	*(15.40)**￼	*(10.33)**￼	*(15.33)**￼
DGR	-1.538	-0.651	-1.460	-0.640
	*(-5.63)**￼	*(-5.83)**￼	*(-5.02)**￼	*(-5.37)**￼
INFL	-0.001	-0.015	-0.000	-0.015
	(-0.04)	*(-2.03)**￼	*(-0.00)*	*(-1.98)**￼
Pop65	0.242	0.118	0.245	0.119
	*(2.58)**￼	*(3.14)**￼	*(2.60)**￼	*(3.14)**￼
Gdppc	0.644	0.499	0.676	0.514
	(1.19)	*(2.17)**￼	*(1.25)*	*(2.23)**￼
R^2	0.97	0.99	0.97	0.99
No. obs	553	556	553	556

share of GDP
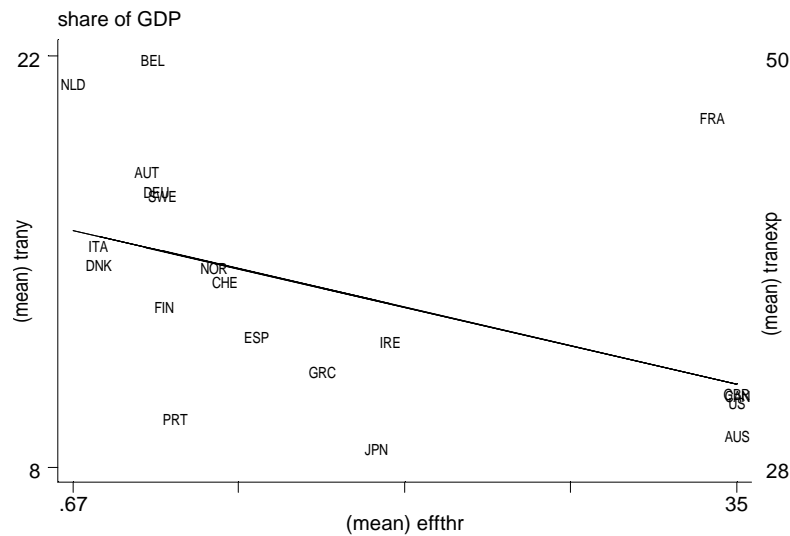
Figure 1. Effective threshold and transfers

share of total expenditure
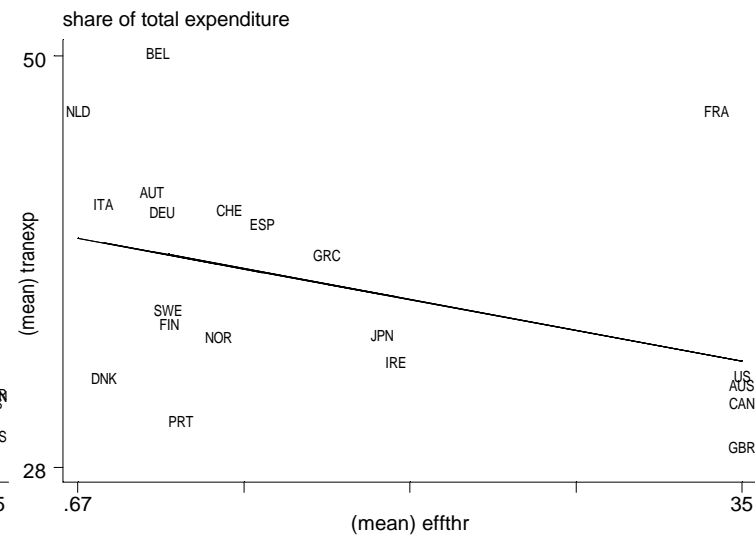
Figure 2. Effective threshold and transfers

share of GDP
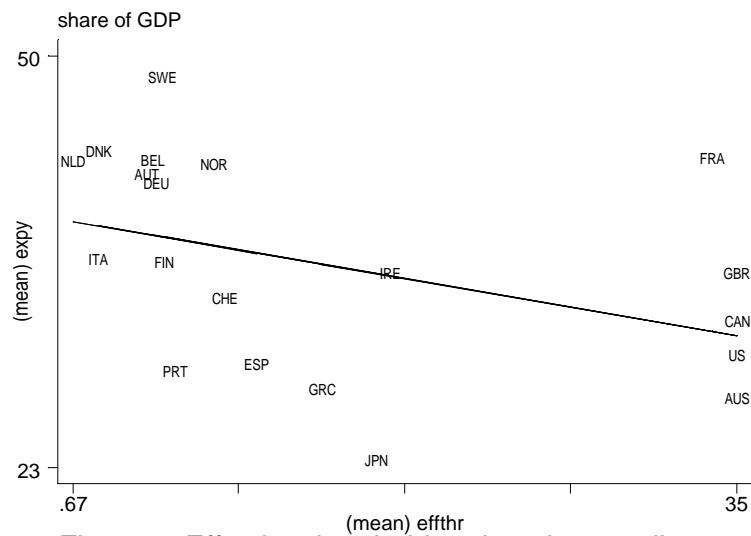
Figure 3. Effective threshold and total expenditure

share of total expenditure
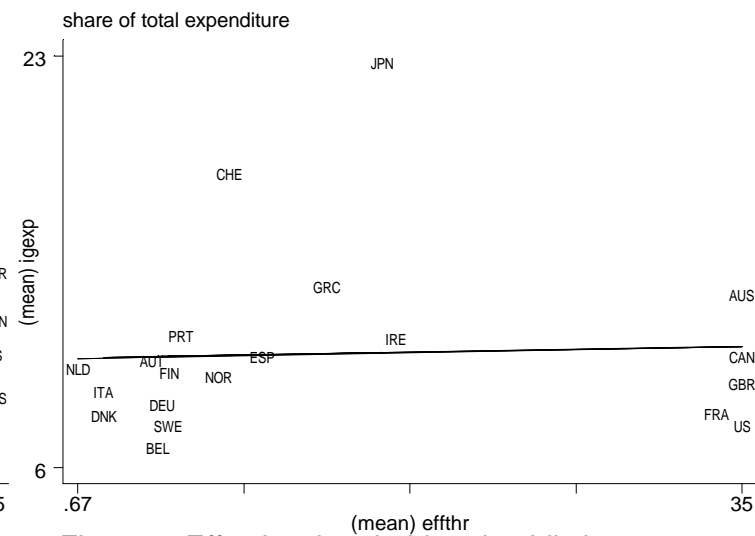
Figure 4. Effective threshold and public investment
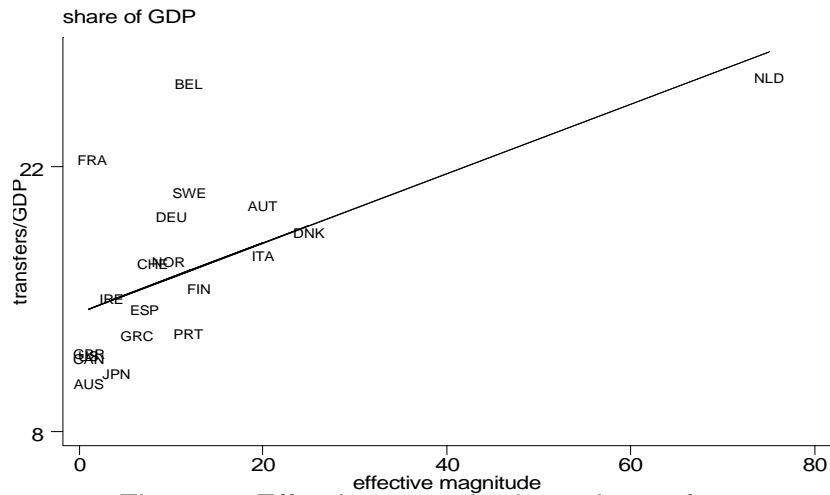
Figure 5. Effective magnitude and transfers
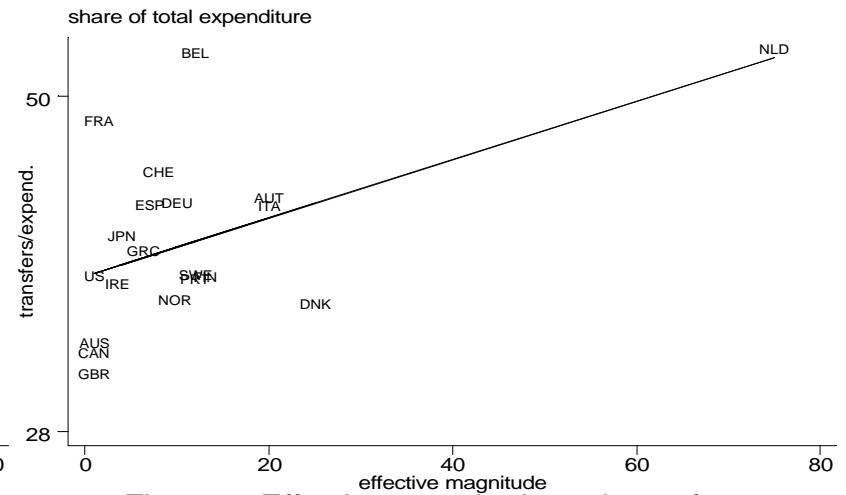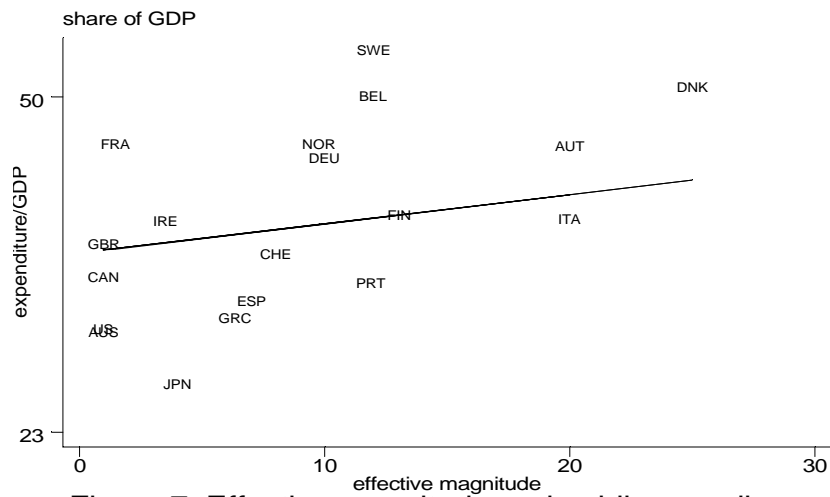

Figure 6. Effective magnitude and transfers
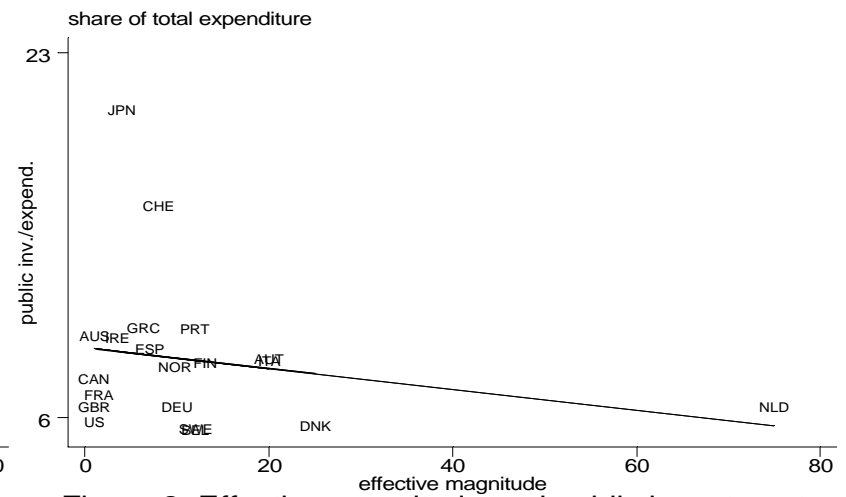

Figure 7. Effective magnitude and public spending
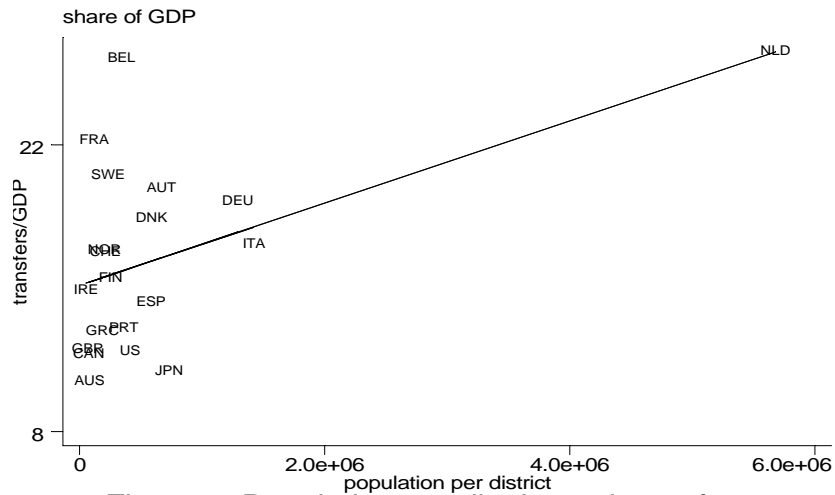

Figure 8. Effective magnitude and public investment

Figure 9. Population per district and transfers
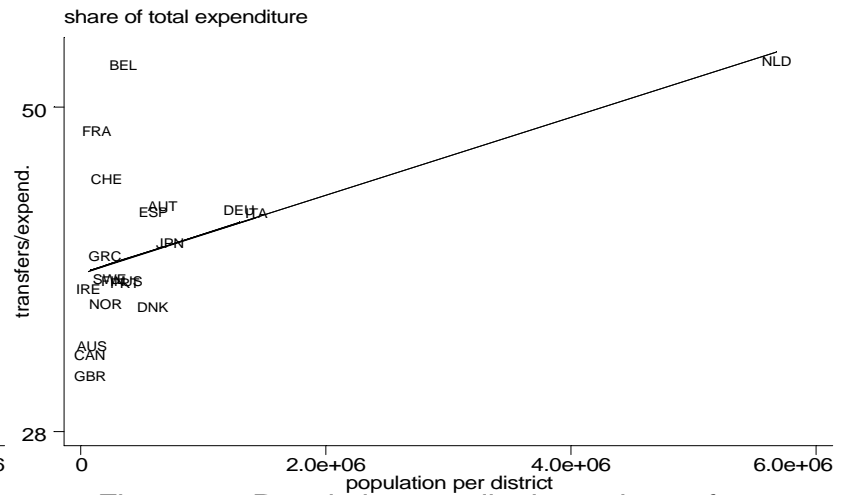
Figure 10. Population per district and transfers
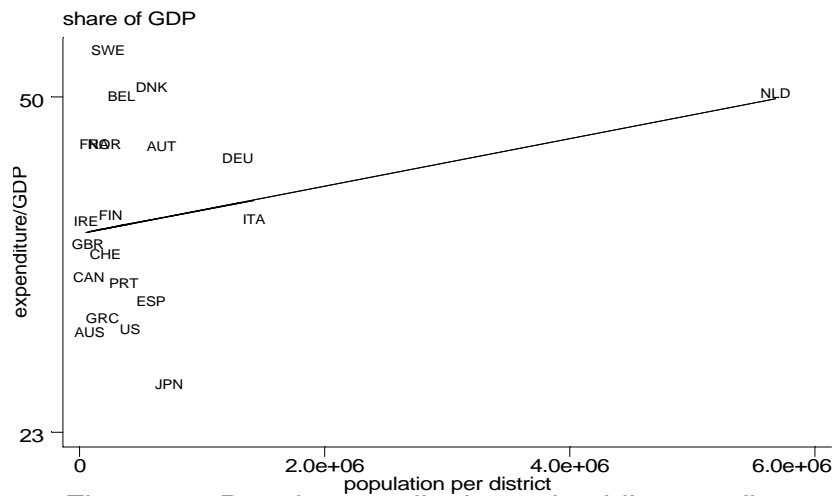
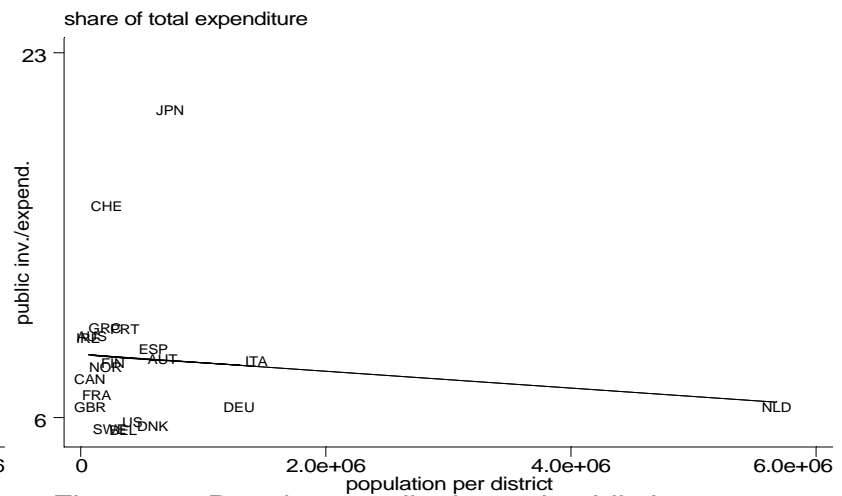Figure 11. Populat. per district and public spending
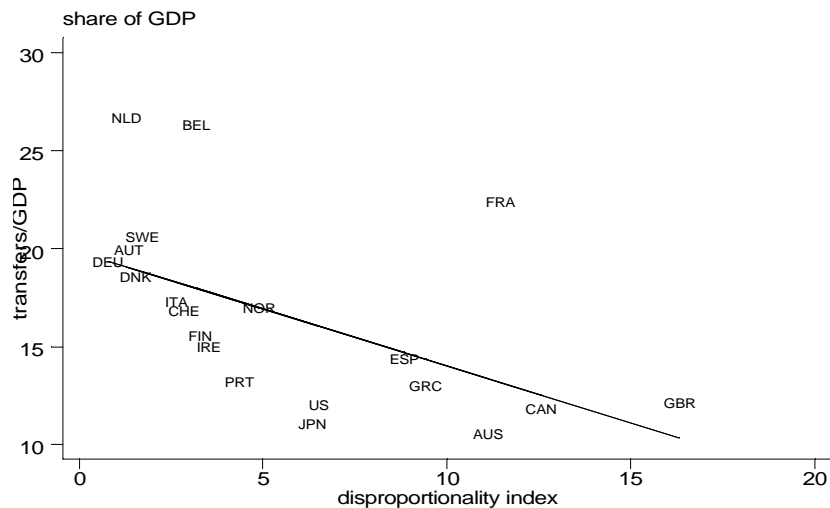

Figure 12. Populat. per district and public investment

share of GDP

transfers/GDP

disproportionality index

Figure 13 Disproportionality index and transfers

share of total expenditure

transfers/expend.

disproportionality index
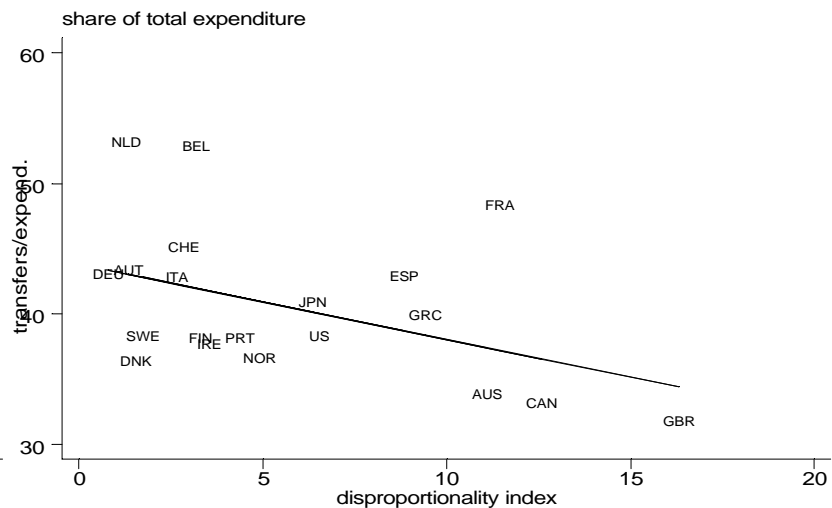
Figure 14. Disproportionality index and transfers

share of GDP

expenditure/GDP

disproportionality index
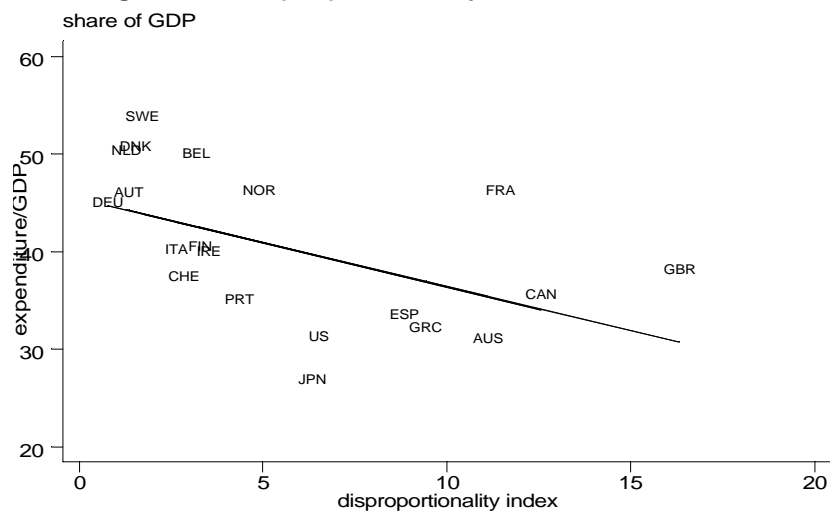
Figure 15. Disproportionality and public spending
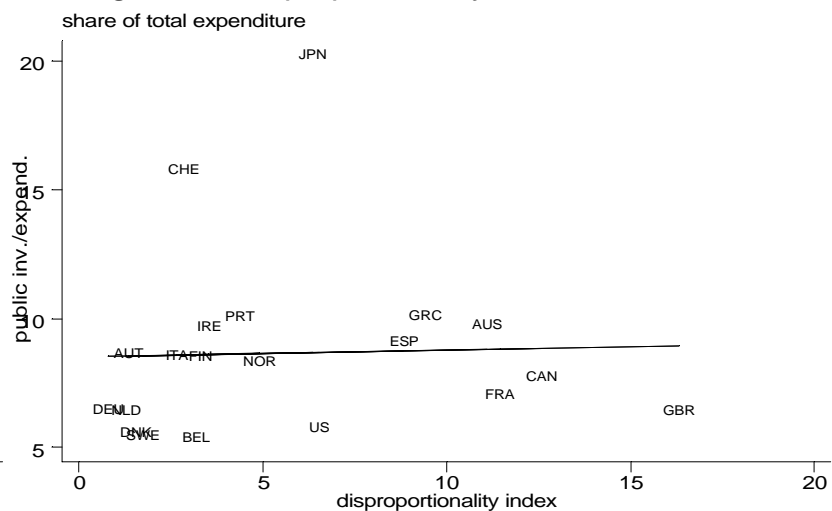

share of total expenditure

public inv./expend.

disproportionality index

Figure 16. Disproportionality and public investment