Disproportionate influence? Special-interest politics under proportional and majoritarian electoral systems

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Abstract

Conventional wisdom has it that proportional representation leads to more coalition governments and so to greater government spending, especially in redistributive categories favoured by special-interest groups. In contrast, we show in a theoretical model that first-past-the-post systems of government may give special interests greater influence in the winning electoral coalition than they would have in the corresponding legislative coalition under proportional representation. Evidence from a quasi-experimental reform in German local government supports this view. Introduction of a mayor directly elected under first-past-the-post rules caused a significant increase in local government expenditure, particularly in redistributive spending categories.

1 Introduction

Voters in many democracies appear to have become dissatisfied with their systems of electing government in recent years, as electoral reforms have been considered or implemented in a number of jurisdictions. Thus New Zealand adopted a mixed-member proportional representation (PR) for its national legislature in 1996, replacing a Westminster-derived first-past-the-post system of majoritarian rule (MR); likewise, voters in three Canadian promises have considered but rejected reforms to introduce some type of PR in place of their current MR systems. At roughly the same time, however, reforms in Germany and Italy have revamped their traditional PR systems of local government, introducing the direct election of mayors on a first-past-the-post basis.

A key question in assessing such a reform is its likely impact on the level and composition of government spending. It is often held that PR, by reducing "barriers to entry" to the legislature, results in more political parties gaining representation, greater instability in the governing legislative coalition, and so greater use of redistributive government spending to maintain coalition stability. In effect, special-interest groups gain a legislative voice under PR, are more likely to hold the balance of power, and so gain disproportionate influence on legislative outcomes.

In this paper, we call into question this conventional view. We present a theoretical model of the effects of the two electoral rules, and we provide evidence from a quasi-experimental reform that introduced majoritarian rule to German local governments.

Our model studies electoral competition and legislative bargaining under PR and MR. In particular, we contrast the policies that serve to maintain a winning *electoral* coalition under MR to those required to maintain a winning *legislative* coalition under PR.

In our model, voters differ in their attitude to an ideological issue and to "special interest" spending that benefits only a minority of the electorate. Two incumbent political parties differ in their stance on the ideological issue, and they promise levels of special-interest spending to voters in order to compete for office, while seeking to prevent entry by new political parties. It is the differing potential for entry deterrence under MR and PR that is central to our results. We show that, under PR, entry deterrence is never successful, and the government is formed by a coalition of parties that share the majority ideology in the population, but differ in their attitude to special-interest spending (Proposition 1). Under MR, in contrast, incumbent parties are successful in deterring entry in equilibrium (a result consistent with Duverger's law), but the election may be won by a party supported by an electoral coalition of voters favouring the minority ideology and the special-interest policy (Proposition 2).[1] We show (Proposition 3) that the resulting level of special-interest spending that supports the electoral coalition of minorities in equilibrium is higher (lower) than that supporting the governing legislative coalition under PR, if the degree of ideological attachment in the population is small (large). Thus the effect of PR is ambiguous in general, but it depends predictably on the relative intensity of voters' preferences for the two dimensions of policy.

In our empirical application, we examine the impacts on government spending of an electoral reform for municipalities in the German state of Lower Saxony. In the reform, key decision-making power was transferred from the municipal council, elected from party lists under proportional representation, to a mayor newly elected under first-past-the-post rules. Important for our empirical approach, the reform was phased in among municipalities over a ten-year period, which admits a difference-in-difference estimator of its effect. We proxy the ideological preferences of voters, pointed to in Proposition 3 of our theoretical model, by an indicator variable that captures whether the mayor is affiliated with a national political party or ran as an independent candidate. Consis-

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[1]The result that MR may result in government by a coalition of minorities is also found in Roemer (1998) and Levy (2004). But the mechanism generating it in our paper is different, and the comparison of MR and PR is new.

tent with Proposition 3, we find that the introduction of first-past-the-post voting led to a significant increase in government spending, particularly in redistributive categories, when the mayor is partisan, but not for independent mayors. Overall, the impact of the reform on spending is fairly small, amounting to a one or two per cent increase in total operating expenditures for partisan mayors.

Our results run counter to those of a recent empirical literature that examines the effects of proportionality on legislative outcomes and government policy using cross-country data. Electoral systems with greater degrees of proportionality are on average associated with higher government spending as a share of GDP (Persson and Tabellini, 2003), and a higher share of government spending devoted to redistributive transfer payments (Milesi-Ferretti et al., 2002). One possible mechanism behind these associations is indeed the potential instability of legislative politics under PR: Proportional systems are associated with an increase in the effective number of parties in the national legislature and grater incidence of coalition and minority governments (Lijphart, 1994). In turn, coalition and minority governments spend more and run greater government deficits (Halleberg and Von Hagen, 1999).

It is evident, however, that drawing causal inferences from the associations in cross-country data is a precarious exercise. National electoral reforms are extremely rare, and cross-sectional differences in government spending may reflect omitted factors related to national culture and institutions that are correlated with electoral rules. Likewise, electoral rules may be endogenous to preferences for spending, if for example voters in countries that prefer greater equity in fiscal policies also prefer the greater inclusiveness for minority political interests that results from proportional representation. Lastly, electoral differences typically come as a package, and it is difficult to disentangle the effects of the electoral rule from related factors such as the size of electoral districts (which may affect the ease of geographic targetting of government spending), the differences between presidential and parliamentary systems, and so on.

Our empirical application deals with these problems by exploiting cross-section–time-series variation in the timing of the electoral reform, which allows us to control for unobservable differences in fiscal policies of municipalities that might be correlated with the electoral rule at a single point in time, and for state-wide changes in the economic and fiscal environment that occurred coincident with the reform. Moreover, confining the analysis to municipalities in a single state ensures that preferences, institutions, and fiscal environments are rather similar in treatment and control groups, both before and after the reform.

Our theoretical model bears some resemblance to that of Persson et al. (2006), who also compare compare PR and MR in a model which features both electoral competition and post-electoral legislative bargaining. In their model, voters vote retrospectively, based on past spending decisions in the legislature, but they make systematic mistakes in attributing spending decisions to parties that are members of a governing coalition. The result is a "common pool problem" among minority parties in the governing coalition (a feature of the equilibrium under PR) that leads to higher redistributive spending than pursued by the single majority governing party under MR. In our model, in contrast, the focus is on frictions in electoral competition rather than legislative bargaining.

The model in Persson et al. (2006) is related to the work of Tsebelis (1995, 1999), which analyzes how proportional representation may increase the number of "veto players" in the bargaining game that determines which government policies are enacted. In rough terms, political parties that are actual or potential members of the governing coalition are veto players that may block specific policy proposals, and the rise in the effective number of parties under PR results in a potential for "legislative gridlock" and status quo bias in policy. As emphasized by Alesina and Drazen (1991), in a fiscal environment of rising costs and declining revenues, status quo bias may result in higher levels of government spending.

Another branch of the literature examines the differing electoral incentives that arise under the two rules. Thus Myerson (1993) compares transfers to minority groups under alternative rank-order scoring rules for aggregating voter preferences and shows that winner-take-all elections are associated with more inequality in transfers than rules that are more proportional in the sense that the payoffs to runners-up are positive. Building on the Myerson model, Lizzeri and Persico (2001) show that redistribution is larger (and universal public goods provision smaller) under MR, if parties maximize vote share under PR but maximize the probability of victory under MR.

A separate literature examines the effect of district size (generally smaller under MR than PR) on geographically targeted transfers. Single-member districts and plurality voting create incentives for parties to offer spending targetted at narrow geographic constituencies, whereas proportional representation favours provision of benefits to broad groups of voters. Thus Persson and Tabellini (1999) study a model in which electoral competition is concentrated in "swing" districts under MR, but not under PR. Likewise, Lizzeri and Persico (2001) show that incentives to provide public goods rather than redistributive transfers are lower under a first-past-the-post electoral college system than under single-district proportional representation. In contrast, our model (and our empirical application) compares MR and PR when there is a single electoral district under both rules, so that the incentive for geographic targetting is absent. In our model—and in our empirical application—voting under either electoral rule takes place in a system electoral district, which permits us to focus on the incentive effects of the electoral rule per se, rather than the way votes are aggregated in electoral districts.

2   The model

There is a continuum population of voters with heterogeneous preferences. Voter preferences differ in two dimensions. First, voters differ in their attitudes to a targeted private good provided by government and financed with equal per capita taxes $g \in [0, G]$ paid by all voters. Voters are of discrete types indexed $j \in \{0, 1\}$: type 1 voters are the "special interest" group, who derive net utility $\lambda > 1$ (in monetary units) for each unit of the targeted good provided; type 0 voters are "taxpayers" who derive no benefit from the good and whose net benefit is therefore $-g$ when g units are provided.

Voters also differ in their attitudes to a universal, discrete policy choice of governments, which we label ideology, and index (arbitrarily) by $i = L, R$. Voters of ideology type $i = L, R$ derive incremental utility $\mu > 0$ from voting for a party that has ideology i, and zero from voting for a party with contrary ideology. Thus the payoff to a voter of type $(i, j) \in \{L, R\} \times \{0, 1\}$ from voting for a party with platform $(p, g) \in \{L, R\} \times [0, G]$ is

$$U_{ij}(p, g) = \mu \delta_{ip} + j \lambda g - (1 - j)g \tag{1}$$

where δ_{ip} is the Kronecker delta. Voting is sincere, and when a voter is indifferent between two candidates we assume he or she votes for the party with coherent ideology.

To make things interesting, we assume:

$$\mu - G \geq 0 \geq \mu - \lambda G \tag{A1}$$

The first part of the assumption guarantees that ideology is always the salient political issue for type 0 taxpayers, in the sense that they prefer a party that shares their ideology to one that does not, regardless of the difference in special-interest policies they offer. The second part, on the other hand, is sufficient for special-interest policies sometimes to be salient to type 1 special-interest

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voters, if the level of spending offered by a party of contrary ideology is sufficiently more attractive than that of parties with coherent ideology.

The two preference characteristics are independently distributed in the population, with

$$\alpha = P(i = L)$$
$$\beta = P(j = 1)$$

(2)

That is, α is the proportion of voters with ideology L, and β is the proportion of special-interest voters. We assume

$$\frac{1}{2} > 1 - \alpha > \beta \qquad \frac{1}{2} > \alpha(1 - \beta)$$

(A2)

The first inequality merely states that ideology L is the majority view in the population. The second inequality states that the group favouring the special-interest policy is smaller than either ideology bloc. To avoid trivialities, the third inequality requires that the plurality $L0$ group (and so no single group) does not constitute a majority of the population.

Assumptions (A1) and (A2), while formally restrictive, together describe a political environment in which campaign promises may be targeted at a small group of voters that, while a minority of the population, may nevertheless be pivotal in elections. Since the group is small, the cost of provision to taxpayers is likewise small, so that promises "matter" to special-interest voters, but never to the public at large.

Parties. There are two incumbent parties, labelled $p = L, R$, and many potential entrants to the political arena.

Incumbent parties are committed to their respective ideologies p, but may alter the special-interest spending g they implement if they form the government. In this respect our model is a standard model of redistributive politics of the type pioneered by Lindbeck and Weibull (1987). Incumbent parties are office-motivated: the payoff of each incumbent party is equal to its fractional vote share in the election, plus an incremental payoff of $b > 1$ if it succeeds in forming the government. This guarantees that incumbent parties always prefer policies that yield a plurality of votes (in the election under MR or in the leegislature under PR) to those that do not, and, among policies that yield either victory or defeat, they choose one which yields maximal vote share. Finally, to avoid uninteresting non-uniqueness in best responses, we assume that, if two policies yield the same vote share, incumbents prefer the one with smaller g.

There is a large number of potential entrants, who may be of any of the four policy types in the population. The payoffs of potential entrants are different: they seek to maximize the utility they derive as citizens from the policy implemented by government, minus a (small) positive cost of entering the election. This guarantees that potential candidates enter only if entry would result in a change in the equilibrium policy g^* that is favourable to them. Thus entrants are policy-motivated in the model, whereas incumbent are office-motivated. This assumption reflects the notion that forming a new political party requires a level of "idealism" about government policy that may not be shared by incumbent politicians who are accustomed to the spoils of office.

The timing of the game is as follows. In the electoral phase, incumbents simultaneously make campaign promises; then potential entrants observe incumbent promises and choose whether to enter the race or not. Voters observe the promises of incumbents and the preference types of entrants, and vote for their preferred candidate. We assume that, if an incumbent and entrant offer identical policies, voters prefer the incumbent. Following the election, seats are allocated to candidates according to electoral rule in place. The policy actually implemented by the government is a pair (p^*, g^*) that is supported by a majority of votes in the legislature.

This description of the game form leaves a number of aspects unspecified, including the nature of campaign promises by incumbent parties and the legislative bargaining process that determines the policies ultimately implemented. Before specifying these aspects, we first describe the two electoral rules we study.

Electoral rules. We consider two electoral rules for forming a government in this environment. Under majoritarian rule (MR), a government is formed by the party receiving a plurality of votes cast, and this party's promised fiscal policy is implemented.

In the MR game, incumbent parties $p = L, R$ compete for office by simultaneously promising special-interest spending g_p, which represent binding commitments to the policy they will enact if elected. Parties may choose any feasible $g_p \in [0, G]$; they are however committed to their innate ideology p, and the (p, g_p) pairs of parties are observable to voters. As citizen-candidates, potential entrants are different: voters observe the preference type of entrants, and they correctly predict that an entrant would implement his or her preferred policy pair if elected under MR. Since voters are sincere, they simply vote for the candidate – incumbent or entrant – that would implement the policy they prefer among those on offer in the election.

Under proportional representation (PR), parties are awarded seats in a legislature proportional to their popular vote shares. The implemented government policy must be supported by a majority of legislators; accordingly, if no party receives a majority of seats, policies are determined through a process of legislative bargaining. In the legislative bargaining subgame, the two incumbent parties $p = L, R$ simultaneous propose special-interest spending policies g_p to be adopted if they form the government, and all legislators choose between g_L and g_R. Thus incumbent parties are modelled as the potential "formateurs" in the legislative bargaining game, who have the exclusive right to make policy proposals and thus, in effect, to propose potentially winning legislative coalitions. We adopt this game form for the legislative subgame for convenience, and for the sake of symmetry between the MR and PR games: In both cases, incumbent parties move first in proposing spending policies, and potential entrants respond to their actions.

A further difference between to the two electoral rules we study lies in the role of electoral campaign promises. Under MR, incumbent parties make firm commitments to spending during the electoral phase. Under PR, such promises are irrelevant, and would be ignored by voters, since the implemented policy will ultimately be determined through legislative bargaining in any case. Another aspect of the model worthy of discussion is the assumption that incumbents are office-motivated whereas potential entrants are policy-motivated citizen candidates. While this assumption seems a plausible description of the interplay between established parties and "independents" that may choose to stand for election, it is also a convenient way of specifying the bargaining rule third parties will adopt in the legislative bargaining phase. An alternative approach would be to assume that potential entrants are, like incumbents, office-motivated, but to permit them to commit during the electoral phase to a particular voting rule, say $v(g_L, g_R)$, they would use in response to the offers (g_L, g_R) of the incumbent parties during the legislative phase.

3 Equilibrium under alternative electoral rules

3.1 Proportional representation

To characterize equilibrium policies in the PR game, our goal is to characterize the equilibrium strategies of all parties in the legislature, and the entry decisions of potential candidates in the electoral phase. We proceed by backward induction, first considering the legislative bargaining

subgame. Observe that, if a party $p = L, R$ has a majority of seats in the legislature, then it has a dominant strategy to propose its preferred policy $(p, 0)$ and vote for it, ensuring its passage. Suppose alternatively that no party has a legislative majority. If a candidate of preference type L1 stands for election, then its seat share in the legislature is no less than $\alpha\beta$, the share of voters of preference type $L1$. It follows, since $\max\{\alpha(1 - \beta), 1 - \alpha\} < 1/2$, that every winning coalition must include $L1$. Let the legislative spending proposals of the two incumbent parties be (g_L, g_R), and recall that the payoff to a legislator of preference type $L1$ from a government led by party L is $\mu + \lambda g_L$, and his payoff from a government led by party R is λg_R. It follows that $L1$ votes for the proposal of party L if and only if $\mu + \lambda g_L \geq \lambda g_R$. In equilibrium, therefore, party L must offer spending $g_L = G - \mu/\lambda$ and commands a majority in the legislature with the support of type $L1$ legislators. To see this, observe that if $g_L < G_\mu/\lambda$, then party R has a feasible winning strategy $g_R \leq G$, that is supported by all legislators other than those of incumbent party L. Since incumbent parties prefer minimal spending among winning policies, it follows that $g^* = G - \mu/\lambda$ in equilibrium when preference type $L1$ is represented in the legislature.

Alternatively, suppose that $L1$ is not represented, and neither incumbent party has a majority of votes. It follows that every winning proposal must be supported by the legislator of type $R1$. In this case, the argument is symmetric, and the equilibrium proposal of incumbent R is $g_R = G - \mu/\lambda$, which is supported by a majority of legislators and is implemented, along with ideology R in equilibrium.

We turn next to the entry stage. The foregoing argument established that the unique equilibrium policy implemented by government is $(L, G - \mu/\lambda)$ when a candidate of type $L1$ enters, and $(L, 0)$ or $(R, G - \mu/\lambda)$ (depending on whether $R1$ enters or not) when no $L1$ candidate enters. Since potential entrants of type $L1$ prefer the outcome when they enter to either potential equilibrium outcome when they do not, exactly one candidate of type $L1$ enters in equilibrium. Given entry at $L1$, an entrant at $R1$ cannot change the equilibrium policy outcome; thus no $R1$ candidate enters in equilibrium.

When the two incumbent parties and a candidate of type $L1$ stand for election, all type 1 special interest voters prefer the $L1$ candidate, while voters of type $p0$ prefer incumbent party $p = L, R$. Thus we have established:

Proposition 1 *In the unique equilibrium under proportional representation, three parties are represented in the legislature, each supported by voters of type $L0$, $R0$, or 1. The government is formed by a coalition of $L0$ and 1 parties, and equilibrium spending on the special-interest policy is $G - \mu/\lambda$.*

3.2 Majoritarian rule

In the MR game, all seats are awarded to the party commanding a plurality of votes, and the legislative bargaining game is irrelevant to the outcome. Voters instead evaluate candidates on their campaign promises (in the case of incumbent parties) or preference types (in the case of citizen-candidate entrants). We therefore seek to characterize subgame perfect equilibria of the game in which incumbent parties $p = L, R$ simultaneously choose $g_p \in [0, G]$, and each potential entrant e subsequently observes (g_L, g_R) and chooses whether to enter or not. Since the equilibrium strategies depend on the relative size of the special-interest group in the population, we proceed by considering a sequence of cases.

Case (i): $\alpha(1 - \beta) > 1 - \alpha$. In this case, the $L0$ preference group is larger than the full set of voters with ideology R, whether of the special-interest or taxpayer type, yet by assumption not a strict majority of the population. In this case, although L remains the majority ideology, party L can be

beaten by a coalition of R and special-interest voters. The winning party must therefore receive votes from both special-interest and taxpaying voters.

Suppose first that party R chooses platform $g_R > \mu/\lambda$. A voter of type $L1$ prefers party L to party R if and only if

$$g_L \geq g_R - \mu/\lambda > 0$$

But $g_L > 0$ implies an entrant at $(L, 0)$ obtains a vote share $\alpha(1 - \beta) > \max\{1 - \alpha, \beta\}$ and wins the election. In the event of successful entry, the payoff to party L is its vote share, $V_L \leq \beta$. Conversely, setting $g_L = 0$ deters entry but results in a loss of the election to party R, yielding payoff $V_L' = \alpha(1 - \beta) > \beta$. Thus $g_L = 0$ is the unique best response to $g_R > \mu/\lambda$. Since party R prefers smaller levels of spending among all winning policies $g_R > \mu/\lambda$, R's best response to $g_L = 0$ is formally not defined. We deal with this technical issue by specifying a smallest unit of money, say $\epsilon > 0$, that may be promised to voters. It follows that the unique equilibrium outcome is that party R wins the election and government spending in equilibrium is (nearly) $g^* = \mu/\lambda$.

The key insight in this case is that in equilibrium the winning party is supported by a diverse coalition of minorities: ideology R voters and special-interest voters. The party representing the majority ideology is impeded from competing for special-interest voters by the need to "defend its base" – $L0$ voters – from predation by potential entrants. In effect, the plurality group in the population is too big to be ignored by parties but too small to be decisive per se.

Case (ii): $\alpha(1 - \beta) \leq 1 - \alpha$. In this case, the share of the $L0$ voter type in the population is less than that of all R ideology types. To solve for equilibrium in this case, we note again that, for any feasible $g_R \in [0, G]$, voters of type $L1$ prefer party L to party R if and only if

$$g_L \geq \max\{g_R - \mu/\lambda, 0\}$$

Since an entrant cannot win the election by choosing a policy preferred by type $L0$ voters when $\alpha(1 - \beta) \leq 1 - \alpha$, the remaining possibility to consider is that of an entrant that receives the votes cast by all special-interest voters of types $L1$ and $R1$, and which therefore wins the election when $\alpha(1 - \beta) < \beta < 1 - \alpha$. When $\beta > \alpha(1 - \beta)$, the unique best response of party R is to set $g_r = G$, deterring entry and ensuring R a maximal votet share of $1 - \alpha$. The best response of incumbent L is therefore $g^* = G - \mu/\lambda$.

Combining these various cases we have:

Proposition 2 *In the unique equilibrium under plurality rule, two parties stand in the election.*

1. *If $\alpha(1 - \beta) < 1 - \alpha$, the government is formed by party L, supported by L0 and 1 voters, and equilibrium spending on the special-interest policy is $G - \mu/\lambda$.*

2. *If $\alpha(1 - \beta) > 1 - \alpha$, the government is formed by party R, supported by R0 and 1 voters, and equilibrium spending on the special-interest policy is μ/λ.*

3.3 Comparing electoral rules

Inspecting the results in Propositions 1 and 2, the equilibrium outcomes are the same when $\alpha(1 - \beta) \leq 1 - \alpha$, so that the size of the $L0$ voter group is sufficiently small to reduce the effects of the threat of entry on party L. But when the $L0$ group is larger than the threshold, the equilibrium outcomes under the two institutions differ. Specifically:

Proposition 3 *Suppose $\alpha(1-\beta) > 1 - \alpha$. The government is formed by the majority party L under proportional representation, and by the minority party R under plurality rule. Equilibrium spending on the special-interest program is greater under plurality rule if and only if*

$$\mu \geq \frac{\lambda G}{2}$$

The key to Proposition 3 is the result that a "coalition of minorities" wins under majoritarian rule, if the majority ideology group is sufficiently large, in the sense that $\alpha(1-\beta) > 1 - \alpha$. This occurs because a campaign promise g_L sufficient to win the votes of type $L1$ voters (and so win the election in the absence of entry) would induce a citizen-candidate of type $L0$ to enter the election and win. To forestall entry, incumbent party L must "protect its base" by promising $g_L = 0$ in equilibrium, but doing so implies that incumbent party R has a winning strategy that is preferred by all special-interest voters.

The special-interest transfers necessary to sustain this diverse electoral coalition are therefore $g^*_{MR} = \mu/\lambda$ (which makes $L1$ voters indifferent between the two incumbents' promises). Under PR, in contrast, entry cannot be forestalled, regardless of electoral promises, a legislative coalition of politicians representing $L0$ and $L1$ voters is always victorious, and equilibrium spending is $g^*_{PR} = G - \mu/\lambda$. Thus, when $\alpha(1-\beta) > 1 - \alpha$, equilibrium spending is larger under MR than under PR if voters' ideological attachment μ is sufficiently large.

4 Electoral reform in Germany

In our empirical work, we examine a reform that introduced first-past-the post election of mayors to local governments in Lower Saxony (Niedersachsen), a large industrial state in northwestern Germany.

In the period beginning with Allied occupation of Germany following World War II, Lower Saxony operated a council-dominated system of local government, similar to that of Britain and the council–manager form of government in some US cities (Cusack, 1999). Elected local councils were the sole local decision-making body, and operated along parliamentary lines. Councils have a large number of elected members (varying in our data between 8 and 65 members). Elections occur every five years, and council members are elected from party-nominated lists of candidates through a system of community-wide (single-district) proportional representation.

Under this system of government, the mayor served a relatively weak role in local government – the office was in fact an honorific title bestowed upon the chair of the council. Administrative matters were delegated to a chief executive officer, appointed for a term of twelve years and responsible to council.

In 1997, the state of Lower Saxony amended its municipal charter legislation to introduce direct election of mayors, chosen in community-wide first-past-the-post elections that take place concurrently with council elections.[2] As well as introducing first-past-the-post elections, the reform involved a substantial shift of power from council to the office of the mayor. Post-reform mayors in Lower Saxony remain voting members of the council, and also chair a steering committee of council known as the administrative committee. Mayors have the sole right to propose legislation (including budgets) to council and the administrative committee, and they have limited veto powers over legislation passed by council. Moreover, mayors directly control the administration of the

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[2]The reform in Lower Saxony was part of a nationwide move to direct election of mayors during the 1990s. All states other than the three city-states now have "strong" mayors directly elected, up from two in the immediate post-war period (Gissendanner and Kersting, 2005).

municipal government and have the sole right to nominate municipal employees (Gissendanner and Kersting, 2005).

In short, the 1997 reform resulted in a significant devolution of power from the municipal council, elected under single-district proportional representation, to the mayor, elected under single-district first-past-the-post or majoritarian rules. Moreover, and key for our empirical approach, the new electoral system was phased in gradually among municipalities in Lower Saxony over a period of ten years, following expiration of the long-term contract with the municipality's chief executive officer. It is this feature of the reform the permits us to employ a quasi-experimental approach to estimating the effects of introducing first-past-the-post, in effect using observations on municipalities that had not yet reformed as controls for other, time-varying unobservable factors that influence government spending over the reform period. It is important to note, therefore, that the order in which municipalities experienced the reform indeed appears to be random. In particular, there is no evidence that "early retirement" of chief executives influenced the timing of reforms at the municipal level.

The 1990s were a period of fiscal retrenchment for all levels of government in Germany, including the municipalities, as governments coped with rising taxes and deficits and an economic slowdown following reunification. At the municipal level, this was accompanied by substantial changes in taxes, transfers, and revenue sharing arrangements. The direct election of mayors was viewed by some actors as a means of dealing with legislative "gridlock" in fragmented municipal councils and so of speeding legislative response to fiscal problems (Wollmann, 2004). Thus, consistent with the "common pool" view discussed above, a primary objective of introducing directly elected mayors appears to have been to reduce or control the level of local government spending. As we will see, actual experience with the reform has been different.

5 Data

Municipalities in Lower Saxony are large, modern administrations with responsibilities broadly similar to those in most other Western countries. They have primary responsibility for local public services and planning, law and order, and primary and secondary schools. In addition, municipalities are responsible for some portion of spending on local health facilities, and deliver social security programs, including cash and in-kind transfers (such as housing subsidies) to the needy. Municipal spending is financed with a variety of taxes on local residents and businesses, and through transfers and revenue sharing arrangements with state and federal governments.

We observe detailed public accounts and political data for the 1994–2005 period, obtained from the State Statistical Office of Lower Saxony. Our sample consists of 399 municipalities with population over 5000. Summary statistics for the principal variables of interest are reported in Table 1. Aggregate operating expenditures averaged 1153 euros per capita and total expenditures (including capital expenditures) 1534 euros per capita. Table 1 also reports statistics for the main functional categories of expenditure.

Partisan politics in German local government, as nationally, is relatively fragmented, with between one and four national parties electing members to council in our sample. The four national parties are the right-wing Christian Democratic Union (CDU), the centre-right Free Democratic Party (FDP), the left Social Democratic Party (SPD), and the Green Party (Greens). The average seat shares of the four are reported in Table 1. In addition to the four national parties, a small number of council seats have been held by members representing local electoral alliances (Waehlergruppen) and independents, which are not reported. Since the 1997 reform, mayoral elections have been

dominated by the CDU and the SPD, the two main national parties, which have held office about 37 per cent and 32 per cent of the two, respectively. In addition, however, 28 per cent of mayors in our sample report themselves to be independents (Einzelbewerben), running without affiliation to a national party. Independent mayors are important to our empirical strategy since, as discussed below, we will use their presence or absence as a proxy for the degree of local voters' ideological attachment, which is the key to our theoretical results.

Our primary controls for factors influencing spending other than the electoral reform are a full set of municipal and year fixed effects in all regressions. Thus we estimate the effect of the reform as the average difference between spending changes in municipalities with first-past-the-post and proportional electoral systems at a point in time. In addition to fixed effects, we include controls for the population, per capita income, and dependency ratio in each municipality and year.

6   Results

We present ordinary least squares estimates for a number of specifications. In all cases the dependent variable is the logarithm of per capita municipal government spending level for one of the functional spending categories described in Table 1. Estimating equations are of the form

$$\text{SPEND}_{it} = \alpha_i + \delta_t + \beta\text{REFORM}_{it} + x'_{it}\theta + \epsilon_{it} \tag{3}$$

where i indexes districts and t indexes years, α and δ are vectors of municipality and year fixed effects, and x_{it} is a vector of controls.[3] The principal coefficient of interest is β, the coefficient associated with the dummy variable REFORM, equal to one in years following the first election of a mayor in the municipality, and zero otherwise.

The inclusion of year effects and municipality effects means that the parameters are identified by variation in spending *within* each municipality over time. Thus, in our baseline specification, without controls, the estimated effect of the reform is simply the average change in log per capita spending in years following the reform. Any time-invariant characteristics of municipalities will be captured by the municipality fixed effect, and therefore not influence our estimates. Likewise, changes in spending over time common to all municipalities will be captured by the year fixed effects, and not by the REFORM variable.

Table 2 reports results for the regression model (3) using aggregate operating expenditures and aggregate total expenditures (including capital investment) as the dependent variables. In this and subsequent tables, standard errors are based on the Huber–White sandwich estimator of the covariance matrix, implemented using Stata's robust command. The first and third columns of the table report the simple difference-in-difference estimates of the reform effect, in which control variables other than the fixed effects are excluded. The coefficient estimate of 0.011 in column (1) implies that operating expenditures rose about 1.1 per cent in municipalities that had elected a mayor on majoritarian principles, compared to those still governed by a council elected under proportional representation. The corresponding estimate for total expenditures in column (3) is an increase of 1.5 per cent; both estimates are significant at the five per cent level.

Including controls for observable socio-economic characteristics of municipalities causes the estimated reform effect, reported in columns (2) and (4) of the table, to decline, but the effect

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[3]The control variables in all specifications are the logarithm of municipal population and its square, the logarithm of per capita income, and the dependency ratio. In subsequent specifications, we include additional controls for other time-varying economic and political characteristics of municipalities; see below.

remains statistically different from zero at the ten per cent significance level. Based on these estimates, annual operating expenditures rose 0.8 per cent on average with the reform, and total expenditures 1.2 per cent. The control variables enter the estimating equation with plausible signs: per capita expenditures are increasing and concave in log population, and increasing in the dependency ratio (the share of population aged over 65 or under 18) and decreasing in per capita income. These last effects perhaps reflect the substantial portion of municipal budgets devoted to social security programs.

Our theoretical model suggests that the comparison between spending under proportional and majoritarian systems is ambiguous in general, so that the positive effect of majoritarian reform in Table 2 cannot be construed as supporting or rejecting the theory—although the result is at odds with results from cross-country comparisons reported by Persson et al. (2006) and others.

Our theory however implies that majoritarian reform increases spending when voters' attachment to incumbent parties on the basis of ideology is strong, and it decreases spending otherwise. Naturally, it is difficult to obtain direct measures of the partisan attachment of voters in each of the 399 municipalities in our sample. As a proxy for partisan attachment, we exploit the presence of Independent mayors—unaffiliated with any of the national political parties—in the data. We hypothesize that ideological attachment is smallest among voters in municipalities that elect Independent mayors. We therefore interact the REFORM variable in equation (3) with dummy variables for Independent and Party mayors, in effect estimating the impact of the reform separately for the two classes of municipalities. Our hypothesis is therefore that the reform effect should be positive for municipalities with Party mayors, and negative for those with Independent mayors.

Table 3 reports results of this approach for the four specifications corresponding to those in Table 2. Consistent with our hypothesis, the reform had a positive and significant effect on spending in all four specifications when a Party mayor was elected. In contrast, spending declined when the reform brought the election of an Independent mayor, although this effect is insignificant in all specifications. To recall the interpretation of the reported coefficients, we note that column(6) of the table implies that annual total spending rose about 1.5 per cent on average with the election of a Party mayor, and declined an insignificant 0.9 per cent with election of an Independent mayor.

The evidence in support of our Proposition 3 adduced from the comparison and partisan and independent mayors is admittedly indirect. The election of an independent to the mayoralty may reflect factors other than ideological preferences of voters, and it might in principle even be endogenous to contemporaneous changes in the fiscal environment of the municipality. Such considerations, if predominant, would bias our estimates and invalidate our approach. We note however that in some German states with longer histories of directly elected mayors, candidates are habitually affiliated with national parties, while in other states they are not (Cusack, 1999). In the short history of mayoral elections in Lower Saxony, such a convention has yet to be established. In that environment, it is plausible that partisan candidates stand for election and win in municipalities where voters' attachment to national political parties is strongest.

6.1 Sensitivity analysis

In Table 4, we report estimates of the two reform coefficients from specifications that include more robust controls for political and socio-economic characteristics of municipalities. In all specifications, as in column (6) of Table 3, the dependent variable is log per capita operating expenditures, and our four baseline control variables are included in the regression.

The sensitivity tests address the following potential concerns with our results so far:

A. Party fragmentation in council: Previous theories of the effects of electoral rules emphasize

the legislative and procedural problems that may arise when many parties have seats inn the legislature. As a first control for party fragmentation of the municipal council (see also Section 6.2 below) we therefore include as a control the Herfindahl index of the council seat share of the national parties.

B. Left–right shifts: An alternative explanation for our results may be that voters' tastes for government may simply have shifted over time and among municipalities in a way that was correlated with the implementation of the reform. To control for this, we include as an additional control the council seat share of the two right-leaning parties, the CDU and FDP.

C. Further partisan shifts: Government policy may respond to changes in partisan legislative power in ways more complicated than contemplated under specification B, and there may be threshold effects on policy as one party's seat share rises sufficiently to award it a plurality or majority in the council. To control for party effects more robustly, we therefore include a full set of dummy variables to capture instances in which each one of the four national parties has a plurality or majority of seats in a municipal council.

D. Population size effects: Fiscal policies are likely to change as municipalities grow or contract in population, trends which may be confounded with the effects of the reform. Furthermore, spending patterns likely differ in large and small municipalities and over time, and there is some evidence that larger municipalities on average reformed earlier in the sample period. In the baseline specification, we control for a linear term in the log population of the municipality. To test for robustness, we divide municipalities into six population size classes,[4] and we include in the regression a full set of size class–year interacted fixed effects. In this specification, spending may therefore differ non-parametrically among size classes, and may grow at different rates in the size classes from year to year, without affecting our estimate of the effect of the reform.

Table 4 reports the reform coefficients for these four specifications, plus a specification that incorporates dummy variables for ranges of the party fragmentation Herfindahl (a non-parametric version of specification A), and one which excludes potentially influential outliers. The results show that the estimated reform coefficients are remarkably robust to these alternative specifications. The coefficient for reform followed by election of a Party mayor is essentially unchanged in all cases from the baseline estimate of 0.015; the reform effect with an Independent mayor is essentially the same in all cases except the outlier specification, and it is insignificant in all cases anyway.

While our empirical results so far have examined aggregates of local government spending, our theoretical model emphasizes those components of spending that are targetted at minority special interests in the voting population. In Table 5, we report results for the same empirical specification as in Column (6) of Table 3, but with particular functional categories of operating expenditure as the dependent variable in place of the total.

We are not aware of any objective metric by which to judge the degree to which spending components are targetted at special interests, so the appropriate selection of categories is in the eye of the beholder. We report results for five categories—Government Administration; Schools; Science, Research and Culture; Social Security; and Health, Sports and Recreation—that is to say, all the categories in Table 1 other than those that appear to comprise local public goods that cannot easily be targetted. While all our selected categories comprise goods that are most valued by a

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[4]The break points for the bins are at populations of 10000, 15000, 20000, 25000, and 30000.

subset of voters, some categories (perhaps especially Schools) are likely to be salient issues for many, and so may not fit out notion of "special-interest spending" particularly well.

An alternative approach, pursued by Milesi-Ferretti et al. (2002) using cross-country national accounts data, is to focus on government spending on transfer payments as opposed to goods and services as the proxy for redistributive activity. The closest analogue to that approach for our data is the Social Security category, which comprises a mix of cash and in-kind payments to needy and elderly local residents. Moreover, Social Security has the largest average per capita spending by far of our five selected categories.

The ten estimated reform coefficients tell a story that is more complex than but broadly consistent with our results for spending aggregates reported in Table 3. For the case of reform with a Party mayor, four of the five coefficients are positive, and three of five are within the 95 per cent confidence interval around the point estimate of the aggregate effect. The only coefficient that is significantly different from zero is for the Social Security category, where majoritarian reform led to a spending increase of about 3.8 per cent. When the reform was followed by election of an Independent mayor, average spending fell in all five categories, as in the aggregate spending data. The effect is significant in three categories—Administration, Science and Culture, and Social Security—where the approximate percentage declines in spending were 4.0, 13.5, and 5.6 respectively.

6.2 Alternative hypotheses

Our theoretical model emphasizes the role of special-interest spending in supporting a winning electoral coalition under majoritarian rule, whereas some prominent competing theories focus on the corresponding difficulties in maintaining legislative coalitions under proportional representation. The next two tables of results report some simple tests of implications of the alternative theories using our data.

One influential view in the literature is that proportional representation increases the number of "veto players" in legislative bargaining games. In the work of Tsebelis (1995, 1999), veto players are political parties that are actual or potential members of the governing coalition, which may block specific policy proposals from passage through the legislature. Consequently, the rise in the effective number of parties under proportional representation results in a potential for "legislative gridlock" and status quo bias in policy. In a fiscal environment of rising costs and declining revenues, status quo bias may result in higher levels of government spending (Alesina and Drazen, 1991).

If the main effect of the electoral rule is on the number of veto players in government and hence on status quo bias in policy, then the effects of the German reform on spending should be largest (whether positive or negative) in municipalities whose councils prior to the reform exhibited the highest degree of party fragmentation. We measure fragmentation once again by the Herfindahl index of the seat shares of the four national parties, and we classify municipalities as being of high, medium, or low fragmentation based on values of the index for the council elected immediately prior to enactment of the 1996 reform.[5] The effect of fragmentation on the reform is then estimated by interacting our Reform dummy variable with dummy variables for the three categories of initial fragmentation in the regression equation.

Table 6 reports results for this specification, where the dependent variable is taken to be total operating expenditures and the five potential "targeted" spending categories. In the specification,

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[5]The breakpoints for the three categories are the 25th and 75th percentiles of the distribution of the fragmentation variable.

we also include a linear term in the fragmentation index for the current year, in addition to the three main category variables for pre-reform fragmentation, coefficients of which are not reported.

Results for total expenditures, reported in the first column of numbers, are clearly inconsistent with the veto player hypothesis. The results show that the effect of majoritarian reform was to increase spending significantly in municipalities with *low* initial party fragmentation, while there was no significant effect on spending where initial fragmentation was medium or high. The results for specific functional categories are less clear, with varying magnitudes and significance of the three reform coefficients. In none of the categories, however, is there a clear relationship between the degree of fragmentation and the magnitude of the reform effect, as predicted by the veto player hypothesis.

Other, related theories emphasize that coalition governments, prevalent under proportional representation, may behave differently than those formed by a single electoral party in a majoritarian system. In the model of Persson et al. (2006), proportional representation leads to more parties represented in the legislature, and legislative bargaining among minority parties in the governing coalition is subject to a "common pool problem" that leads to higher redistributive spending than pursued by the single party that governs under majoritarian electoral rule. Thus, as the authors emphasize, in this view "The electoral rule affects government spending, but only indirectly: proportional elections induce a more fragmented party system and a larger incidence of coalition governments than do majoritarian elections."

If the main (indeed, only) effect of the electoral rule is on the incidence of coalition government, then the reform introducing majoritarian rule should decrease spending in municipalities where there is no no majority in council, but it should have no impact where a majority party exists in the legislature and can govern without need for coalition bargaining. To test this possibility, we interact our reform variable with a dummy variable equal to one in municipalities and years where a party holds a majority of council seats ("Council majority") and equal to zero otherwise ("Council minority"). Under the Persson-Roland-Tabellini hypothesis, the former coefficient is predicted to be zero and the latter to be negative.

Table 7 reports the results for this specification. Inconsistent with the hypothesis, the estimated coefficient for Reform∗(Council minority) is never significantly negative, and is in fact significantly positive for two of the six categories reported, including total expenditure. Moreover, Reform∗(Council majority) is significantly negative (rather than the zero effect hypothesized) in two other categories, suggesting a significantly positive difference of the reform effect for councils without a majority party occurring quite robustly across spending categories. Thus there is effectively no evidence in the data that the effect of the reform was to reduce spending undertaken by minority councils.

7   Conclusion

Our basic empirical results are simple: introduction of directly elected mayors in Lower Saxony over the past decade has led to an increase in local government spending. The effect is small but significant, and it appears to be confined to Social Security spending and some other categories of redistributive spending.

Since mayors are elected in city-wide first-past-the-post elections, and they supplanted municipal councils elected from party lists based on a system of proportional representation, the reform in Lower Saxony is an apt laboratory in which to study the differential effects of majoritarian rule and proportional representation. Important for this interpretation, and for our empirical strategy, is the

quasi-experiemental nature of the reform, which was phased in gradually among municipalities in the state over a ten-year period.

In this context, our empirical results are rather surprising. Previous evidence from cross-country comparisons (largely cross-sectional) of electoral systems, has led researchers to conclude that proportional representation is typically associated with higher levels of redistributive spending, perhaps because of the greater incidence of coalition and minority governments in PR systems. Our evidence is manifestly inconsistent with that view, and specific tests based on our data appear to reject the "veto players" and coalition-bargaining hypotheses.

One way to make sense of our results is in the context of a theoretical framework that compares the equilibrium special-interest spending required to maintain a winning legislative coalition under PR to that required to maintain a winning electoral coalition under MR. In our model, different winning coalitions may emerge under the two electoral rules, because of the potential for incumbent parties to deter entry of new candidates under MR, but (as in Duverger's law) not under PR. Moreover, because governing electoral coalitions under MR are apt to consist of voter groups with diverse preferences, the transfers required to support electoral cohesiveness can be as high or higher than those needed to support legislative coalitions in proportional systems. Consistent with that view, we find in our data that spending rises under MR when it is followed by the election of a mayoral candidate affiliated with a national political party, but not for non-partisan mayors.

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Table 1: Summary statistics

	Obs	Mean	Std. Dev.	Min	Max
Public accounts data (euros per capita):					
Operating expenditures	5187	1152.77	369.50	633.23	4052.98
Total expenditures	5187	1534.27	440.17	783.61	5737.48
Administration	5187	107.85	34.24	53.14	543.94
Public security	5187	40.77	23.70	6.30	220.72
Schools	5187	89.99	60.78	14.76	1587.33
Science, research, and	5187	19.14	25.57	0.00	390.08
Social security	5187	242.51	145.73	29.92	1324.68
Health, sport, recreatic	5187	50.87	42.10	1.20	565.58
Streets and housing	5187	160.69	68.21	35.30	740.81
Public utilities	5187	195.19	111.97	0.86	870.73
Public enterprises	5187	64.69	80.12	0.00	1847.07
Miscellaneous	5187	562.55	233.57	18.46	4514.90
Political data:					
Council seat shares					
CDU	5199	0.46	0.14	0.00	0.94
SPD	5199	0.39	0.13	0.06	0.71
FDP	5199	0.04	0.05	0.00	0.32
Greens	5199	0.04	0.04	0.00	0.21
Council majority	5199	0.47	0.50	0.00	1.00
Mayor's party					
CDU	1464	0.37	0.48	0.00	1.00
SPD	1464	0.32	0.47	0.00	1.00
FDP	1464	0.01	0.08	0.00	1.00
Greens	1464	0.00	0.04	0.00	1.00
Independent	1464	0.28	0.45	0.00	1.00
Controls:					
Population	5187	19314.06	33240.94	5014	525763
Income per capita	4788	10264.83	1855.14	5834.91	24751.52
Pct age<19	5187	0.17	0.02	0.10	0.29
Pct age>64	5187	0.16	0.03	0.00	0.31

Table 2 - The effect of electoral reform on log total spending (fixed municipal and year effects, 1994-2005)

Explanatory variables	Expenditure variables							
	Log operating expenditures per capita$_t$				Log total expenditures per capita$_t$			
	(1)		(2)		(3)		(4)	
	Coef.	Std.	Coef.	Std.	Coef.	Std.	Coef.	Std.
Reform$_t$	0.011	0.005 **	0.008	0.005 *	0.015	0.006 **	0.012	0.006 *
Time-variant control variables:								
Log population$_t$	-	-	1.980	0.725 ***	-	-	0.626	0.860
Square of log population$_t$	-	-	-0.137	0.038 ***	-	-	-0.071	0.045
Log income per capita$_t$	-	-	-0.075	0.037 **	-	-	-0.061	0.042
Dependency ratio$_t$	-	-	0.439	0.214 **	-	-	0.236	0.240
R^2	0.869		0.875		0.768		0.776	

Notes: All models use a balanced panel of 5187 observations (399 municipalities). Standard errors and test statistics are based on the Huber-White sandwich estimator of the variance-covariance matrix for fixed effects models.

Table 3 - Distinguishing the electoral reform effect for party and independent mayors

	Expenditure variables							
	Log operating expenditures per capita$_t$				Log total expenditures per capita$_t$			
Explanatory variables	(5)		(6)		(7)		(8)	
	Coef.	Std.	Coef.	Std.	Coef.	Std.	Coef.	Std.
Reform$_t$ with party mayor	0.018	0.006 ***	0.015	0.006 ***	0.024	0.007 ***	0.019	0.007 ***
Reform$_t$ with with independent mayor	-0.010	0.008	-0.009	0.008	-0.009	0.010	-0.008	0.010
Time-variant control variables:								
Log population$_t$	-	-	1.992	0.724 ***	-	-	0.641	0.857
Square of og population$_t$	-	-	-0.137	0.038 ***	-	-	-0.071	0.045
Log income per capita$_t$	-	-	-0.069	0.037 *	-	-	-0.053	0.042
Dependency ratio$_t$	-	-	0.424	0.214 **	-	-	0.219	0.240
R^2	0.870		0.875		0.768		0.776	

Notes: All models use a balanced panel of 5187 observations (399 municipalities). Standard errors and test statistics are based on the Huber-White sandwich estimator of the variance-covariance matrix for fixed effects models.

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Table 4 - Sensitivity analysis for reform coefficients

		Modifying Model (6)			
		Party mayor		Indep. mayor	
	Label	Coef.	Std.	Coef.	Std.
Including the following controls in addition to the original ones:					
Herfindahl of seats of 4 major parties in councel$_t$	A	0.014	0.006 ***	-0.008	0.008
Share of conservative parties' (CDU/CSU and FDP) seats in councel$_t$	B	0.014	0.006 ***	-0.009	0.008
Including dummies for party majority and party plurality in councel$_t$	C	0.015	0.006 ***	-0.009	0.008
Including dummies for size classes of municipalities$_t$	D	0.016	0.006 ***	-0.010	0.008
As C but including dummies for 8 classes of major 4 party Herfindahl$_t$	E	0.014	0.006 **	-0.008	0.008
Checking the influence of multivariate outliers	F	0.011	0.005 **	-0.002	0.008

Table 5 - Reform effects by functional category of expenditure

	Administration	Schools	Science and Culture	Social Security	Health and Recreation
Reform with party mayor	0.007	0.023	-0.025	0.038***	0.025
	[0.008]	[0.017]	[0.026]	[0.012]	[0.021]
Reform with indep. mayor	-0.040***	-0.002	-0.135***	-0.056***	-0.045
	[0.010]	[0.028]	[0.043]	[0.019]	[0.029]
Time-variant control variables:					
Log population	-1.002	9.707***	3.737	-0.34	2.134
	[1.112]	[2.326]	[3.188]	[1.508]	[2.848]
Square of log population	0.025	-0.505***	-0.215	0.054	-0.106
	[0.059]	[0.122]	[0.166]	[0.079]	[0.149]
Log income per capita	0.091	0.002	0.034	-0.462***	0.349***
	[0.115]	[0.109]	[0.164]	[0.081]	[0.129]
Dependency ratio	-0.225	4.574***	-1.863**	1.291***	1.734**
	[0.322]	[0.714]	[0.916]	[0.457]	[0.733]
Observations	5187	5187	5175	5187	5187
R-squared	0.72	0.71	0.83	0.83	0.79

Robust standard errors in brackets
* significant at 10%; ** significant at 5%; *** significant at 1%

Table 6 - Reform effects and council fragmentation

	Total	Administration	Schools	Science and Culture	Social Security	Health and Recreation
Reform*(low fragmentation)	0.027** [0.011]	-0.034** [0.014]	0.038 [0.027]	-0.052 [0.044]	0.003 [0.018]	0.033 [0.032]
Reform*(medium fragmentation)	0.006 [0.008]	0.012 [0.008]	0.002 [0.019]	-0.049* [0.029]	0.027** [0.013]	-0.018 [0.022]
Reform*(high fragmentation)	0.012 [0.010]	-0.023* [0.012]	0.03 [0.028]	-0.083* [0.043]	-0.013 [0.018]	0.041 [0.037]
Party fragmentation	-0.036 [0.068]	-0.169** [0.075]	0.172 [0.165]	-0.634** [0.281]	0.045 [0.120]	0.138 [0.205]
Log population	0.518 [0.864]	-1.042 [1.128]	9.720*** [2.345]	3.155 [3.263]	-0.429 [1.504]	2.156 [2.865]
Square of log population	-0.066 [0.046]	0.028 [0.060]	-0.507*** [0.123]	-0.185 [0.170]	0.059 [0.079]	-0.11 [0.150]
Log income per capita	-0.067 [0.043]	0.089 [0.116]	-0.002 [0.112]	-0.01 [0.168]	-0.475*** [0.082]	0.338*** [0.129]
Dependency ratio	0.245 [0.242]	-0.175 [0.319]	4.564*** [0.724]	-1.744* [0.920]	1.415*** [0.466]	1.684** [0.735]
Observations	5187	5187	5187	5175	5187	5187
R-squared	0.78	0.72	0.71	0.83	0.83	0.79

Robust standard errors in brackets
* significant at 10%; ** significant at 5%; *** significant at 1%

Table 7 - Reform effects and coalition government

	Total	Administration	Schools	Science and Culture	Social Security	Health and Recreation
Reform*(Council majority)	**0.001**	**-0.016***	**0.015**	**-0.078****	**-0.009**	**0.039**
	[0.008]	**[0.009]**	**[0.021]**	**[0.033]**	**[0.014]**	**[0.025]**
Reform*(Council minority)	**0.020****	**0.002**	**0.015**	**-0.04**	**0.031****	**-0.018**
	[0.007]	**[0.008]**	**[0.020]**	**[0.030]**	**[0.014]**	**[0.023]**
Council minority	0.005	-0.011	0.031	0	-0.015	-0.007
	[0.009]	[0.009]	[0.023]	[0.000]	[0.016]	[0.028]
Log population	0.656	-1.102	9.833***	3.396	-0.304	2.013
	[0.862]	[1.118]	[2.333]	[3.226]	[1.491]	[2.860]
Square of log population	-0.072	0.03	-0.512***	-0.198	0.052	-0.102
	[0.045]	[0.060]	[0.122]	[0.168]	[0.078]	[0.150]
Log income per capita	-0.056	0.085	0.002	0.002	-0.464***	0.332***
	[0.043]	[0.117]	[0.112]	[0.169]	[0.081]	[0.128]
Dependency ratio	0.206	-0.235	4.588***	-1.874**	1.290***	1.856**
	[0.239]	[0.320]	[0.720]	[0.922]	[0.461]	[0.733]
Observations	5187	5187	5187	5175	5187	5187
R-squared	0.78	0.72	0.71	0.83	0.83	0.79

Robust standard errors in brackets
* significant at 10%; ** significant at 5%; *** significant at 1%