Coalition Parties versus Coalitions of Parties:
How Electoral Agency Shapes the Political Logic of Costs and Benefits

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Abstract

This paper argues that governments formed as transient, post-election coalitions of many parties make systematically different policy choices than single-party governments, even though parties large enough to govern alone obviously represent a coalition of interests. The basis of our argument is our claim that parties externalize costs not borne by their support groups. Larger parties represent more groups and therefore internalize more costs. We develop a model to show that even though groups do better if they are represented by large coalition parties, fragmented party systems result of equilibrium choices with proportional representation. The key prediction is that the size of the public sector should be larger, the more parties in government and the more fragmented the party system. These predictions are tested using data from the 1970's-90's in 17 European countries. We find that increasing the number of parties in government and increasing the fragmentation of the party system both substantially increase the fraction of GDP accounted for by government spending. An additional party in government leads to an increase of almost a percentage point of GDP spent in the public sector in by centrist governments. The effect of additional parties in government is more pronounced for right-wing coalitions than for those on the left.

Introduction

Democratic government is government by coalition. In many countries, governments are explicit multi-party coalitions. Even in cases of single party government, a party that wins a parliamentary majority represents – almost by definition -- a coalition of interests. The difference seems to be one of sequence. In some cases majority coalitions are formed by parties after elections. In other cases, parties work to forge a majority support base before the election.

Does this sequence of coalition formation and electoral contest matter for how society's interests are aggregated? What difference, if any, does it make if governments are formed by a single party that represents a coalition of interests, or a by a coalition of parties, each of which represents a single interest? One might think that in either case, a (roughly majority-sized) coalition of interests would control government through their agents.

We argue here that the number of parties does matter. A coalition of parties behaves differently than a coalition party, even when the set of interests represented are identical. The difference stems from the nature of electoral accountability. A single party in government is electorally accountable for all policy decisions it makes. A majority-seeking party should seek to protect its collective reputation with a brand name, or party label that is fairly encompassing of society's interests. Parties that participate in coalition governments, by contrast, are held primarily responsible only for a subset of policy decisions, for the policy areas in which they have the biggest stake, and the biggest impact. Lacking a mechanism with which to commit credibly to a particular configuration of parties in government, or for that matter, lacking even a collective stake in the continuation of any particular coalition of parties, coalition governments should be more prone to common pool problems such as overspending in areas that deliver benefits to relatively narrow constituencies.

The separate electoral accountability of each party in a coalition government causes it to make different policy decisions than would a single party majority government, even one that represented exactly the same coalition of interests in society. Specifically, we claim that the decisions of coalition governments reflect the policy preferences of the coalition partner that places the highest priority on the dimension, and that these preferences reflect a greater externalization of costs than with government by a single coalition party.

This paper develops a model to demonstrate how electoral accountability leads a multi-party coalition to make different policy decisions than a single party coalition, and how both single party and multi-party government can result from strategic behavior by groups. The model predicts that governments composed of more parties, and those in more fragmented party systems, will spend more overall. We test these last predictions using data using data from 17 European countries from the 1970's to the 1990's. The empirical analysis shows strong support for our claims. The more parties there are in governments, and the more fragmented the party system, the larger the public sector. The effect of number of parties in government is particularly strong, persisting even when we control for country and year effects, as well as previous spending.

1. Background and Intuition: Coalitions of Parties versus Coalitions as Parties

Our model of electoral accountability assumes that groups evaluate parties not only in terms of policy positions but also in terms of the relative priority given to different policy dimensions. When there is a coalition government, voters and interest groups assign responsibility for a particular policy whichever party gave that dimension highest priority. More credit and blame for environmental policy is assigned to an incumbent Green party, for example, than to its

coalition partners. Specifically, voters and groups (1) assume that in multi-party governments, policy decisions are made by the coalition partner that gives the policy the highest priority, and (2) use this assumption to assess strategically the policy consequences of what party to support in the election.

Our model of policy-making by multiparty coalitions owes much to Laver and Shepsle's (1994, 1996) model of ministerial government. Their focus on ministerial independence offers one reasonable mechanism by which coalition governments implement logrolls. Our argument is also consistent with the empirical finding that parties in coalition seem to get cabinet positions in rough proportion to their size (Laver and Schofield 1990; Druckman and Wakefield 2001).[1]

Along the same lines, our model of parties as ongoing of groups builds on the work of Schwartz (1989) and Aldrich (1995), who view parties as "long coalitions." The "long coalitions" model argues that parties are formed to protect the groups they represent from the vagaries of shifting coalitions. We find the long coalitions argument extremely compelling, and seek here to examine the policy consequences of coalitions of different sizes and lengths. We will also show that while the long-coalitions logic is weakened in some ways by proportional electoral systems, its basic core still holds.

Both the Laver-Shepsle and the Aldrich-Schwartz models conceptualize the space of policy alternatives as multi-dimensional. We do as well, despite the well-known advantages of a unidimensional framework. Convenience aside, however, it is hard to justify the assumption that the space of feasible governments is unidimensional on theoretical grounds. Governments choose policies from a multidimensional choice set – they can choose, for example, high or low levels of military spending, high and low degrees of protection for domestic industry, more or less regulation of various sectors. The fact that some choices seem to go together empirically is, in our view, of product of the way institutions (Ferejohn 1993, Wright and Schaffner 2002), parties (Schwartz 1989, Aldrich 1995), and ideology (Hinich and Munger 1994, Bawn 1999) structure choices. Granted that in some countries, observed political competition does seem to be captured by a single left-right dimension, but many countries (PR countries in particular) display more dimensions (Rogowski 1987). This suggests that even in countries where observed political conflict appears to be unidimensional, this fact should more properly be regarded as a *consequence* of political choices, including the choice of electoral rules, rather than as a fundamental constraint.

We use a multi-dimensional model in which the dimensionality of the policy space reflects the structure of society. That is, we assume there are as many true policy dimensions as there are groups in society. The *observed* dimensionality of party competition, however, will depend on the number of electorally viable parties – the more parties, the more dimensions. Our results stand in conflict with those of other scholars who have compared coalition government and single-party government in the context of a unidimensional spatial model. Kalandrakis (2001) and Powell and Vanberg (1998) argue that coalition governments actually come closer than majoritarian systems to representing the preferences of the median voter. Coalition governments, they argue, produce relatively stable outcomes over time whereas majoritarian governments take turns skewing policy towards the interests of their respective constituencies.[2]

[1] At the same time, we don't see a contradiction with Thies's (2001), monitoring model, which suggests that ministers have to work within the "coalitional contract." This kind of oversight is also necessary because, unless issue dimensions are entirely unrelated, policies implemented in one jurisdiction can undermine policies implemented in another.

[2] See also Alesina and Rosenthal 1989.

Our concern with the number of parties in a system necessitates consideration of how electoral systems structure coordination problems between groups, and how, given that structure, the coordination problems are (or are not) solved. Our model is consistent with the well-documented association between proportional representation (PR) and multi-party government on the one hand, and single-member districts (SMD) and single party majorities on the other (Duverger 1953, Riker, 1982, Cox 1990, 1997). Like Cox (1990), we find it useful to think of the consequences of electoral systems in terms of countervailing incentives, specifically, the *incentive to consolidate* (form a coalition party) and the *incentive to fragment* (form a splinter party). These incentives bear an obvious similarity to Cox's notion of centripetal and incentive to fragments, but there are two key differences. First, they reflect the multidimensional nature of the policy space. Second, and more important, these incentives apply to the groups who form parties, not to parties themselves.

The consequences of electoral systems *per se* are not our main focus, and most of what our model implies about the consequences of electoral systems is consistent with conventional wisdom. For example, we find a strong incentive to consolidate under SMD, and no real incentive to fragment. Under PR, we identify an incentive to fragment. But, departing from conventional wisdom, we also observe an incentive to consolidate under PR. The incentive to fragment is due to the higher benefits from a party that advocates its supporters' ideal policies, without compromising with other groups. (And, importantly, a party that, as part of a coalition government, will be able to implement those policies on high priority dimensions.) The incentive to consolidate has two components. One is that larger parties need fewer coalition partners, the other is the efficiency gain from internalizing more costs. The presence of an incentive to consolidate under PR is a novel feature of our model, and one that we believe comports well with reality, since many PR countries have parties that represent relatively broad coalitions of interests.

The main result of our model, however, is the size of the public sector will be larger, (a) the more fragmented the party system, and (b) the more parties there are in government. Parties in fragmented systems run on platforms tailored to gain the support of a narrow constituency. They gain this support by ignoring or "externalizing" all costs and benefits that accrue to groups outside their narrow core of support. The broader a party' base of support, the smaller the fraction of costs that are externalized. Increasing the number of parties in government does not necessarily increase the number of groups represented, but it does increase the extent to which specific policy decisions balance diffuse costs against targeted benefits. As we will show below, the predictions are strongly supported by patterns of government spending in Europe from the 1970's through the 1990's.

2. A Model of Electoral Accountability: Basic Assumptions

Our basic argument is that coalition parties make policy choices differently than coalitions of parties, other things equal, even when the same groups are represented. The "other things" we hold equal include:

1. The composition of society and the preferences of groups.

2. The information available to groups, and the ways that groups use information in deciding what party to support.

3. The process of government formation and decision-making within governments.

We discuss each aspect of the overall framework in turn.

(a) The composition of society and the preferences of groups

Like much research on European politics, our model takes as given groups of voters as the primary unit of electoral behavior.

Suppose there are n groups in society and that each group i has a "project"[3] or issue that it cares about. Let x_i denote the scale of the i-th project – the degree of protection for a particular industry, for example, or the level of public benefits targeted to a particular group. A government's policy $X = (x_1, x_2, \ldots x_n)$ simply consists of the scale of every potential project.

Let the benefits of project i, $B_i(x_i)$, accrue only to the group i, while the costs $C_i(x_i)$ are born by all groups, so that each group's cost share of project i is $\frac{C_i(x_i)}{n}$. The goal of each group i is to maximize its net benefits $B_i(x_i) - \frac{1}{n}\sum_{j=1}^{n} C_j(x_j)$. For simplicity, we assume that the relationships between project scale and benefits and costs are the same for all projects. We want to focus on cases in which all participants have finite ideal levels for the project (even the farm lobby doesn't want all of GDP to be spent on subsidies.) A simple way to implement this focus is to assume that benefits are linear

$$B_i(x_i) = x_i$$

and that costs are quadratic

$$C_i(x_i) = x_i^{\,2}.$$

for all projects i. Note then that the ith group's ideal policy is to set $x_j = 0$ when $j \neq i$ and $x_i = \frac{n}{2}$.

We assume that the groups are all the same size, and that virtually all voters belong to one of the groups. There are, however, a small number of unattached voters. These voters cannot be targeted by politicians and their voting behavior is random.[4] Realistically, we can think of the unattached voters as those who pay no attention to politics. For simplicity, we assume here that the number of unattached voters is smaller than the size of any one group. The unattached voters are important for our model because they create electoral uncertainty.

(b) Information Sources and Voting Decisions

We assume that groups are fully strategic in the sense that they accurately anticipate the impact of their support on policy, including anticipating the consequences of multi-party government. That is, a voter who votes for a party that focuses on representing the interests of her group alone understands that this party will only be able to get into government by compromising with other parties. The group votes in the way that gives it the highest expected utility from policy, given the behavior of other groups.

This kind of electoral accountability is not problematic with single party governments. It is only feasible for multi-party coalitions, however, if voters can determine an individual party's marginal contribution to a coalition government's decisions. While in theory this can be a

[3] The term "project" reflects the historic use of this type of model in studies of pork barrel politics, such as Weingast, Shepsle and Johnsen 1981.

[4] Zaller (2002) shows that unattached voters are primarily responsible for the impact of the economy and other valence issues on elections. In this sense, of course, their behavior is not random. For our model's purpose, however, the important thing is that parties cannot compete for the support of the unattached on the basis of policy.

difficult problem (see the discussion in Schwartz 1994), we note that in reality parties work hard to give voters information about their marginal contribution to coalition policies.[5] We assume that parties promulgate platforms that contain their *goals* and *priorities*. Goals indicate the policy positions the party will try to bring about – they are the party's public declaration of its ideal point in the *n*-dimensional space of group projects.

Priorities, as the name implies, indicate which projects or dimensions the party thinks are important. Specifically, they indicate which issues the party is willing to take responsibility for if in government. Formally, party *j*'s priorities are denoted by an *n*-vector $\mathbf{a_j} = (a_{1j}, a_{2j}, \ldots a_{nj})$ where $0 \le a_{ij} \le 1$ indicates the extent to which party *j* wants to associate itself with policy regarding the *i*-th project. In ordinary usage, the word "priority" indicates relative importance, and we preserve that in the model by requiring the elements of any party's priority vector to sum to one. For example, if there are five projects, a party with priority vector (1, 0, 0, 0, 0) associates itself completely with the first project, a party with priority vector (1/5, 1/5, 1/5, 1/5, 1/5) associates itself with all projects equally, and a party with (1/2, 1/3, 1/6, 0, 0) associates itself most strongly with the first project, somewhat less with the second, less still with the third and not at all with the fourth and fifth. The requirement that the priority weights sum to one implies that in order to strengthen its associate with one issue a party must weaken its association with another.

When we say "party *j* represents group *i*" or that "*i* is one of *i*'s constituent groups" we mean that $a_{ij} > 0$. Note however, that when the party decides to represent group *i*, it must accept blame for the costs of project *i* as well as credit for the benefits.

As we will discuss below, we assume that on each policy dimension, a coalition government implements the ideal policy (the platform goal) of the coalition partner who assigned the highest priority to that dimension. For example, suppose that parties A and B are in coalition together, that party A's platform has a goal level of 1 on a dimension to which it gives priority 1/3, and that B has a goal of 2 and a priority of 1 on that same dimension. Because B assigned higher priority to the dimension, the coalition government implements B's goal policy of 2. This assumption is very close in spirit to Laver and Shepsle's model of multiparty government, although we focus on policy outcomes directly, without regard to the allocation of portfolios.

By observing the parties' platforms, groups can thus precisely anticipate the policies that will be implemented by any possible coalition government. This anticipation allows them to react strategically to the electoral system.

The unattached voters are not strategic, or even instrumental – they are too poorly informed. Although unattached voters in reality undoubtedly react systematically to some aspects of the political environment – incumbency, scandal, the economy – we model them here as a complete wild card. We assume that unattached voters vote with equal probability for any viable party. In order for a party to be viable, it must get the support of at least one organized group. Note that the unattached voters vote as a block, consistent with evidence that they react to the economy and other valence issues.

[5] Powell and Whitten (1993) find that incumbent governments are more likely to lose votes if they are single party majorities, and in the case of coalition governments, if they are composed of fewer parties. We don't deny that assessing responsibility of multiparty governments is more of a challenge for voters than assessing responsibility of single party government. But these data also cast doubt on the possibility that voters let parties in multi-party governments avoid blame altogether.

(c) Government Formation and Policy-Making

We recognize that coalition governments can occur in majoritarian countries and that single party majorities can emerge in proportional countries. The empirical regularity whereby single party governments are associated with majoritarian electoral systems and coalition governments with PR is a result, not an assumption, of our model.

We assume that governments are minimal winning coalitions (MWC) in Leiserson's (1966) fairly strong sense: Governments will be composed of the minimum number of parties needed to make a majority. That is, if a two-party majority is possible, we will not see three-party coalitions; not even those that would not involve superfluous parties. A weaker assumption would simply be that there would be no superfluous parties in coalitions (i.e. no party that could withdraw and still leave the coalition with a majority), or that any majority or supermajority coalition could form. A stronger assumption would be that the smallest coalition in terms of seats would form (Riker's minimum winning coalition), or the cheapest one.[6]

We assume that all MWC's, in Leiserson's sense, are equally likely. We do not model any formateur effect whereby the largest party, would be asked to propose the coalition.[7] Our assumption that coalitions include the minimum number of parties needed for a majority does, however, build in an advantage for the largest party. This comports with empirical evidence (Martin and Stevenson, 2000, and contributes to our unorthodox claim that incentives to consolidate exist even in proportional systems.

As we discussed above, the party in the government with highest priority on each policy dimension makes decision on that dimension. Parties do not deviate from their platform goals. This assumption is crucial for the ability of voters to make fully strategic decisions.

(d) Electoral rules

The above discussion has established the assumptions of our model which apply to both SMD and PR electoral systems. A word now is in order about how we model the systems themselves – that is how vote shares translate to seat shares. Our model of PR is straightforward. The party's fraction of seats is the same as its fraction of votes. We ignore real world complications like minimum vote thresholds, district magnitude and allocation formulae.

Under SMD, we assume that groups, and the unattached voters, are evenly distributed across districts. This is a significant departure from reality. By ignoring differences among districts, we ignore a potential source of coalition government in SMD systems. Under SMD, of course, the seat in each district is won by the party that gets a plurality of votes. Our assumption that all districts are the same implies that the same party will win all districts.[8] This is obviously unrealistic, and we hope to consider the impact of heterogeneous districts in future work.

3. The Logic of Electoral Agency: Two Scenarios

[6] Note that by ruling out coalitions that are composed of more parties than necessary, we do, in effect, systematically rule out more expensive coalitions.

[7] Druckman and Warwick's (2001) empirical work shows that the formateur party is actually somewhat undercompensated in cabinet assignments.

[8] See Chhibber and Kollman (1998) on how district heterogeneity impacts party systems. McGillivray (1997, 2002) shows how district heterogeneity with respect to sectoral composition affects the geographic distribution of subsidies and tariff protection; and for Persson and Tabellini (1999) district heterogeneity is a key assumption for concluding that SMD systems under-provide public goods.

We begin with two stylized scenarios, one in which each group is represented by its own party, and a second in which the groups divide into two parties of equal size. In the first scenario, groups support the party that best champions the group's interest, both in the sense of espousing the group's ideal point, and in the sense of giving highest priority to the group's own projects. In the second scenario, groups support coalition parties whose platforms maximize the joint utility of all their constituent groups.[9]

The theoretical section of this paper proceeds as follows. The remainder this section discusses the policy choices that result in each of the two scenarios. This discussion illustrates our basic argument: *Multi-party governments implement inefficient logrolls because each policy dimension is controlled by a party that externalizes a large fraction of the costs of that dimension's project.* Section 4 then examines how these inefficient logrolls can be equilibria in games of electoral coordination.

Define a *maximally fragmented party system* (MFPS) as one in which each group has party that gives all priority to that group's dimension and sets its goal equal to the group's ideal. Note that if Group i could set policy unilaterally, it would set $x_i = \frac{n}{2}$ and $x_j = 0$ for $i \neq j$. The MFPS thus consists of six parties, each of which sets $x_i = \frac{n}{2}$ and $a_i = 1$ for one $i = 1\ldots n$. That is each party espouses the ideal policy of its target group and gives all priority to the dimension that benefits that group. This platform is the one that maximizes the party's marginal product, that is, it maximizes the party's contribution to the group's welfare (Schwartz 1994.)[10]

In the maximally fragmented party system, each party attracts the support of its own group with probability one and the support of the unattached with probability $1/n$. The MWC government will consist of the party that won the support of the unattached and $\frac{n}{2}-1$ others (each with equal probability). Ex ante, each party faces a .5 probability of being in government.

The utility of a group whose party is in government is thus

$$U_{IN}(MFPS) = \frac{n}{2} - \frac{1}{n}\left(\frac{n}{2}\right)\left(\frac{n}{2}\right)^2 = \frac{n}{2} - \frac{n^2}{8} \ .$$

The utility of a group whose party is out is

$$U_{OUT}(MFPS) = -\frac{1}{n}\left(\frac{n}{2}\right)\left(\frac{n}{2}\right)^2 = -\frac{n^2}{8} \ .$$

[9] In our model, all groups are equally important, and have equal bargaining power. We do not allow for the possibility of "captured groups" (Frymer 2000) who are less able than others to switch their support from one party to another.

[10] To see why putting all priority on the group's own dimension maximizes marginal product, observe that lowering costs on other dimensions produces positive externalities for other groups, while all the positive effects of increasing benefits on the group's own dimension are internalized.

The ex ante expected utility of any group under MFPS is $\frac{n}{4}-\frac{n^2}{8}$. No matter what government forms, $\frac{n}{2}$ projects are undertaken at a scale of $\frac{n}{2}$ each. The cost of the government's policy over all dimensions is $\frac{n^3}{8}$.

Similarly, define a *balanced two-party party system* (BTPS) as one in which there are two parties, each of which represents one half of the groups. This party, seeking to maximize the welfare of groups 1, 2 … $\frac{n}{2}$, giving equal weight to each, would externalize only $\frac{1}{2}$ of the costs (as opposed to externalizing the much larger fraction $\frac{n-1}{n}$). The coalition party's optimal project level for *i* =1, 2 … $\frac{n}{2}$ occurs when marginal benefit equals $\frac{1}{2}$ of marginal cost. That is, the party solves

$$\max_{x_i} x_i-\frac{1}{2}x_i^2,$$

which implies an optimal policy of $x_i = 1$ for each group *i* that the party represents. If Party A represents the first $\frac{n}{2}$ groups, and Party B the remainder, then each party wins a majority (either overall or in each district) with probability .5, and forms a single party government.

The utility of a group whose party is in power is

$$U_{IN}(BTPS)=1-\frac{1}{n}\left(\frac{n}{2}\right)\cdot 1^2=\frac{1}{2}\ .$$

The utility of a group whose party is out of government is

$$U_{OUT}(BTPS)=-\frac{1}{n}\left(\frac{n}{2}\right)1^2=-\frac{1}{2}.$$

The ex ante expected utility of any group in the BTPS is 0. It is important to note that the number of projects undertaken is exactly the same as with the MFPS, but at a lower scale. Three projects are undertaken, but at a lower scale. The overall cost of the public sector is $\frac{n}{2}$.

(Table 1 about here)

Table 1 compares the consequences of the two stylized party systems. Two points bear mention. First of all, the chance that a group is represented in government is the same in either system. This stands contrary to a claim that is often made in favor of PR, namely, that multi-party systems do a better job of representing a wider variety of interests (Lijphart 1977, 1984; Huber and Powell 1994). Second, and most important for our overall argument, note that $\frac{n^3}{8}>\frac{n}{2}$ whenever $n > 2$. The size of the public sector is larger when each group is represented by its own party, than when coalition parties represent a broad enough segment of society to form a single-party government.

These stylized scenarios support the intuitive argument that coalitions of parties make different policy choices than coalition parties. Single interest parties adopt platforms that externalize a larger share of costs than coalition parties do. In multiparty coalitions, parties are able to implement their platform goals on the dimensions they care most about. Together, these two claims imply that coalitions of parties will create a larger public sector than a single coalition party. More generally, we have

PROPOSITION 1: If a government must represent a majority of interests, the more parties are in the government, the larger will be the cost of the public sector.

REASONING: To see that our model implies Proposition 1, let s_j be the number of groups represented by party j. Party j's ideal project level is that which sets marginal benefit equal to $\frac{s_j}{n}$ of marginal cost. This ideal is the solution to

$$\max_{x_i} x_i - \frac{s_j}{n} x_i^2$$

or $x_{ji}^* = \frac{n}{2s_j}$. (The subscript on x_{ji}^* indicates that it is the jth party's ideal level for the ith group's project.) An increase in the number of parties in government implies that some parties are representing narrower constituencies, that is, s_j is lower for some j. Decreasing s_j for any party j has the effect of increasing its ideal scale for each of its constituent groups. Thus, x_i is higher for at least some dimensions, while the number of dimensions on which $x_i > 0$ remains the same ($\frac{n}{2}$), regardless of the number of parties in government. Therefore, the overall costs of the government's program, $\sum_{i=1}^{\frac{n}{2}} x_{ji}^*$, increases.

4. Electoral Systems and Party Systems

Table 1 also highlights a problem with the intuitive argument, however. All groups are better off when coalition parties compete to form single-party governments. Given this, why would they support single interest parties? One possible explanation is naiveté – groups support the party whose platform they like best, ignoring the strategic considerations such as the how the process of forging a multi-party coalition will impact policy.

An alternative explanation, which we will pursue here, is that electoral institutions promote or prevent resolution of the collective action and coordination problems among groups, and the party system is completely determined by the extent of the resolution. The above two stylized party systems correspond roughly to the stereotypes associated with the two canonical types of electoral rules. A BTPS is stereotypically associated with SMD, and a MFPS with PR (Duverger 1954, Downs 1957, Riker 1984, Cox 1990, 1997). In our terms, SMD creates an incentive to consolidate because winner-take-all races in the district reward size. PR, on the other hand,

creates an incentive to fragment in order to because the proportionality promotes fragmenting of parties.[11]

Yet the stereotypes are not necessarily empirically accurate. There are proportional systems with relatively few parties, such as the Federal Republic of Germany from the mid-1950's to the early 1980's and SMD systems with relatively many, such as Canada and India.[12] Our multi-dimensional framework gives a more nuanced picture of a group's incentives to consolidate (support a coalition party) or fragment (support a narrow party that focuses on its own interests). We assume that groups correctly anticipate the costs and benefits of each strategy, as reflected in the probabilities of different types of government and different policies. The structure of the pay-offs depends on the electoral system, as well, so we will analyze each separately.

We first examine the decision to fragment or consolidate in an SMD system. Here, our model's results are consistent with the conventional wisdom that the incentive under SMD is to consolidate. A BTPS is stable under SMD. Moreover, if groups are able to coordinate, a fragmented party system will consolidate into a BTPS. We then examine how the strategic situation differs under PR. Here the results get more interesting. We confirm our intuition that the BTPS is not stable under PR. We do not find, however, the party system necessarily degenerates into maximal fragmentation. PR creates an incentive to fragment, but it does not completely offset an incentive to consolidate that arises from an increased chance of being in government, and the more efficient trade-offs made by coalition parties. The important point for our overall argument is to show how the incentive to fragment can persist, despite the potential gains to all groups from consolidating.

We focus on the decisions of groups to support coalition parties or splinter parties. We do not treat parties themselves as strategic actors, but simply assume that parties choose their platforms to maximize their marginal contribution to their constituents' welfare (Schwartz 1994). Concretely, this means that platform goals are the policies that maximize the joint utility of all constituent groups, and that priority is equally divided among the constituent groups' dimensions.

The argument proceeds by an examination of which configurations of parties can be sustained as Nash equilibria in games in which the pay-offs are the expected benefits from government policy, taking account of electoral uncertainty (due to the unattached voters) and coalitional uncertainty about the composition of government. We can make all of the points that we need to with an example in which there are six groups, and we will use this example for the remainder of the section.

(a) SMD and the Incentive to Consolidate

Suppose we have SMD and a BTPS in place, so that Party A represents groups 1, 2, and 3 and Party B represents 4, 5, and 6. Consider the problem from the point of view of groups 1, 2, and 3 – given that groups 4, 5, and 6 are consolidated, is there an incentive to fragment? Specifically, let each group face the choice of supporting coalition party A, which offers the coalitionally-

[11] Cox looks at district size, number of candidates in a race, the right or not of voters to abstain, etc., to see when a candidate's optimal position is at the median or away from it. This is a trenchant insight, one that extends to the multidimensional case we consider here.

[12] As Riker pointed out, national majoritarian parties should emerge out of single member districts because of the economies of scale associated with capturing a parliamentary majority. But strong regional differences, such as in India or Canada, can reduce the perceived gains from merger from the standpoint of some districts. We leave the examination of district heterogeneity to future work.

efficient policy of $x_i = 1$ for $i = 1,2,3$ or a splinter party (C, D or E) which puts all priority on the group's dimension and offers the group its ideal policy $x_i = 3$.

Figure 1 depicts this situation as a three-way game (we are holding the choice of groups 4, 5 and 6 constant). The pay-offs are expected utilities that take account of uncertainty about (1) which party the unattached voters will support and (2) which party or parties will form a majority government. The pay-offs to this and all subsequent games are derived in the Appendix. If all three groups consolidate by supporting party A, then the election outcome depends on the choice of the unattached; A wins with probability 1/2; and the expected utility (as discussed above) is 0. If one or more of the groups splinter, Party B wins the election with probability 1, and the pay-offs to groups 1, 2 and 3 are
–1/2. Groups 1, 2 and 3 all have a dominant strategy of consolidating. Note that groups 4, 5 and 6 will also have dominant strategies to consolidate, given that 1, 2 and 3 have. The BTPS is a Nash equilibrium in the overall six-way game. There is no incentive to fragment under SMD.

Suppose we start from a MFPS, however. Does SMD lead groups to consolidate in a fragmented system? Figure 2 (a) depicts the pay-offs from fragmenting and consolidating on the part of groups 1, 2 and 3, assuming that 4, 5, and 6 each vote for their own parties as described above. The first thing to note in Figure 2(a) is that all three groups supporting coalition party A is a Nash equilibrium. With groups 4, 5 and 6 fragmented, if 1, 2 and 3 consolidate, their party wins with probability 1 and they get pay-offs of 1/2.

The second thing to note is that this Nash equilibrium is not unique. Given the fragmented opposition, all it takes is for two of the three groups to support Party A in order for it to win a plurality with probability one. Cells (b), (c) and (e), in which two of the three groups support the coalition party give the same pay-offs as when all three groups consolidate. These cells are also Nash equilibria in this three-way game in which the actions of players 4, 5 and 6 are held constant. But they seem implausible as stable party systems for two reasons. First, if Party A only attracts the support of groups 1 and 2, it seems unlikely that it would keep a platform that offers benefits to group 3. Second, the scenario in which two groups consolidate and the other four splinter seems unlikely to be sustainable in the six-way game. Given that groups 1 and 2 have consolidated and group 3 fragments, wouldn't groups 4, 5, 6 consolidate as Party B, thereby guaranteeing themselves a plurality?

Yes, they would, as Figure 2(b) demonstrates. The scenario depicted here assumes that Groups 1 and 2 have consolidated behind a party that maximizes their joint utility (project levels $x_1 = x_2 = 3/2$) and Group 3 has fragmented. Figure 2(b) examines the overall strategic scenario from the point of view of groups 4, 5 and 6. All three groups have a dominant strategy to consolidate. We would thus not expect the kind of "submajority party system" indicated by cells (b), (c) and (e) in Figure 2(a) to be stable under SMD.

Note, however, that the MFPS, indicated by cell (h) in Figure 2(a), is also a Nash equilibrium. If every other group fragments, no single group can benefit by unilaterally switching support to a coalition party. A completely fragmented party system may persist with SMD if something about the historical or social context made it focal.
The main point of Figures 2(a) and 2(b), however, is that under SMD, the incentive to consolidate is strong indeed, limited only by the possibility of coordination failure (cell (h)).

(b) PR: Countervailing incentives
Fragmenting and consolidating give rise to different election outcomes under PR, and thereby to different pay-offs. We begin with the same scenario we started with above. Assuming a BTPS

exists, do the groups that constitute one of the coalition parties have an incentive to divert their support to splinter parties that focus on that group's issue alone? Is there an incentive to fragment in this multi-dimensional scenario?

Figure 3 depicts the clear incentive to splinter under PR, given consolidated opposition. The game is a three-way Prisoner's Dilemma. Fragmenting is a dominant strategy for each of the three groups, giving a unique Nash equilibrium (cell h) that is Pareto inferior to the outcome when all groups consolidate (cell a). Consistent with expectations, the BTPS is not sustainable under PR.

Now suppose that the opposition is fragmented, as in Figure 4. The stereotype of PR would suggest that full fragmentation (cell h) would be the unique equilibrium outcome here, but that is not the case. Full fragmentation (MFPS) is a Nash equilibrium, but it is only one of four. Moreover, the MFPS equilibrium is Pareto dominated by the other three in which two groups consolidate and the third fragments.[13] There is an incentive to consolidate here, albeit a weaker one (relative to SMD), one that brings only two groups together under a single party, leaving one with a preference to splinter.

What is the source of this incentive to consolidate on under PR? To understand this, we need to examine the pay-offs in Figure 4 in more detail. Consider the situation in cell (b), where groups 1 and 2 support coalition party A and group 3 supports its own splinter party E. Given that group 3 reacts to the incentive to fragment, why don't groups 1 and 2 have an incentive to follow suit?

Look at the decision from group 1's point of view. If group 1 supports A (given that 2 does and 3 does not), the viable parties will be A and E, along with the splinter parties that represent groups 4, 5, and 6 – call them F, G and H. With probability 1/5, A wins the support of the unattached, thereby getting 3/7 of the seats while E-H each wins 1/7 each. In this scenario, an MWC consists of A plus any other party. With probability 4/5, the unattached support one of E, F, G or H, giving that party 2/7 of the seats. Party A would also have 2/7; the remaining three would have 3/7 each. The MWC in this case would consist of whichever splinter party received the unattached support plus Party A. Part of the incentive to consolidate is due to largest party being more likely to be included in government. The fact that the larger party offers its constituent groups a more efficient also contributes.

As in Figure 2 above, we need to address two aspects of the situation depicted in Figure 4. First, in any of the Pareto efficient equilibrium, party A gives benefits to a group that supports a different party at the expense of the two groups that support A. Second, the behavior of groups 4, 5 and 6 is held constant. Figures 5, 6 and 7 address these two points.

Given that a coalition party will only attract the support of two groups in equilibrium, its platform should only aim at two. Assuming that groups 3-6 support splinter parties, will
Groups 1 and 2 support a party that maximizes their joint utility? The optimal platform for such a party is $x_1 = x_2 = 3/2$. Figure 5 depicts this two-way game. Like Game 2, which illustrated the incentive to consolidate of SMD, this game is Assurance. If the parties can communicate, or observe each other's moves, we would expect them to arrive at the Pareto optimal equilibrium in which both support the coalition party. The incentive to consolidate here is strategically identical to that in SMD, but the resulting coalition is smaller.

[13] This three-way coordination game combines features of Assurance and Battle of the Sexes. As in Assurance, some of the Nash equilibria are better for all players than others. But like Battle of Sexes, each player most prefers a different Nash equilibrium.

The final question to ask is whether there is an incentive for a second coalition to form. Figure 6 depicts the incentives to form another two-group coalition, and Figure 7 shows the incentive to form a three group coalition. Given that groups 1 and 2 have consolidated to support Party A′, will groups 4 and 5 consolidate to form Party B′ (Figure 6)? Will groups 4, 5 and 6 consolidate to form Party B′′ (Figure 7)? In either case, supporting the splinter party is a dominant strategy.

Overall, Games 5, 6 and 7 illustrate the limited incentive to consolidate that exists in PR. There is an incentive for a submajority coalition party to form, because of the advantages of size and efficient logrolls. Once one coalition party has formed, however, the incentive to fragment dominates and the remaining groups prefer to support splinter parties.

The differences in incentives to consolidate and fragment between SMD and PR give rise to different party systems. Moreover, these same incentives shape the dimensionality of observed political competition. In an SMD country, the true dimensionality of the policy space may be very large, but a BTPS will organize the politically feasible alternatives along a single dimension. Policies that benefit the constituent groups of Party A, for example, may define the conservative agenda; those that benefit the constituents of Party B would correspondingly define the liberal agenda.[14] Given the incentive to fragment that operates in PR rules, a party's best niche is to exploit whatever existing cleavages exist in society, to find the most secure electoral position possible.

The endogeneity of the dimensionality of political competition has wide reaching implications. Our model cautions against trying to fit European politics into the Procrustean bed of Downsian analysis. Rather, unidimensional electoral competition should be thought of as special case, one that has arguably had an exaggerated affect on how the discipline thinks about politics. The hegemonic status of unidimensional models may be one reason why the study of European politics has tended to be less integrated into mainstream electoral analysis, dominated as it was by ill-fitting models imported from across the Atlantic.

The main point of this brief digression on party systems is to demonstrate how the socially inefficient policy choices we attribute to coalitions of parties can reflect equilibrium choices by groups that understand the implications of multi-party government.[15] We now return to the main argument and show that our proposition that more parties in government means a larger public sector is supported by spending data from Europe.

5. Data

There are two testable implications of our claim that parties externalize the costs not borne by their own constituent groups. First, as the number of parties in government rises, so should the amount of government spending. Second, as the party system becomes more fragmented, government spending should also rise. We test this proposition with data from 17 Western European countries, from roughly 1970 to 1999. The results are strong and robust. Increasing the number of parties in government increases the fraction of GDP accounted for by the public

[14] Ferejohn (1993) went some distance in this theoretical direction when he implied that unidimensional policy space should be stable only under SMD, because only there did it make strategic sense for parties to use one-dimensional ideology as an electorally valuable commitment mechanism.

[15] Note that we have note considered entry by all possible parties. For example, we have not discussed entry by parties that represent 4 (or more groups). In part, this has been because our interest has been in establishing that an incentive to fragment exists, despite its inefficient consequences.

sector, as does increasing the fragmentation (decreasing the concentration) of the party system. Both effects hold up when we control for ideology and socio-economic conditions. The effect of the number of parties in government is particularly robust, remaining significant even after country effects and the previous year's size of the public sector are controlled for .

Our dependent variable is the overall expenditures of a government in a given year, measured as a fraction of GDP. We believe that total spending is the most appropriate measure for our theory, because more narrow measures (e.g. civilian spending, transfers) leave out types of spending that create benefits in the form of contracts for government projects (Weingast, Shepsle and Johnsen 1981).[16] Table 2 displays the years and countries for which we currently have data. Note that the sample consists primarily of countries with proportional electoral systems (the UK is the only true plurality system that would correspond to the SMD models above.) The number of parties in the governments varies considerably, even among proportional representation countries. This is consistent with the multiple equilibria that the previous section identified in games of electoral coordination.

Our theory predicts that the size of the public sector increases (a) the more parties there are in government and (b) the more fragmented the party system. The number of parties in government is straightforward to measure. The only difficult issue arises from the fact that our dependent variable is observed on an annual basis, and government may change mid-year. In cases where the number of parties in government changes during the year, we take the weighted average (weights are days in power.) For example, if a coalition of 3 parties rules for 9 months and a coalition of 2 parties for the remaining 3 months, the number of parties would be coded as 2.75. We use this same weighting scheme for the concentration of the party system and the ideology of the government (discussed just below.)

One might think that it would be better to code the composition of the government at the time that the yearly budget was passed. We have not done this, in part because we do not (at the moment) know the dates of budget passage. There is also a theoretical reason to use the weighted average, which is that many countries pass supplemental budgets that alter the primary budget passed. Since our dependent variable reflects actual outlays, our primary independent variable should take account of all governments who have an opportunity to affect public sector spending.

For the countries and years in our dataset, the number of parties in government varies from a minimum of one (many observations) to a maximum of 5.24 (Belgium 1978). The mean value is 2.16.

We measure the fragmentation of the party system in terms of its opposite, that is concentration. We define "the party system" here as the set of parties that win seats in the legislature, and use a conventional Herfindahl index ($\sum_i s_i^2$ where s_i is the seat share of the ith party) to measure party system concentration. An alternative measure of party system concentration is the "effective number of political parties." This latter measure is simply the reciprocal of the Herfindahl index, and thus picks up the same effects. We chose to use the Herfindahl index because it is slightly less correlated with the number of parties in government, -.70 as opposed to .74. Note that both of these correlations are fairly high, a fact that will cause us to examine their effects on the size of the public sector separately as well as jointly.

[16] That said, preliminary analysis of transfer spending shows a similar effects for the number of parties in government.

The concentration variable takes its maximum value (0.580) in Greece in the early 1970's, and its minimum value (.119) in Belgium in the early 1990's. Comparing average concentration values for the countries in our sample, the most concentrated system over time is the UK, averaging .459. The least concentrated is Belgium, averaging .150. Sweden, with an average concentration of .288 mostly closely approximates the overall sample mean of .303.

We include the ideological orientation of the government as a control variable. Our model does not lead us to expect that a party's ideological orientation will affect its spending preferences; we assume that all groups prefer more rather than less spending on themselves, and that they discount the cost in proportion to the size of the burden borne by other groups. But we include ideology as a control variable because the conventional wisdom is that parties on the left have a preference for higher levels of spending, or at least for higher levels of redistribution. We used Martin and Stevenson's coding for ideological orientation, based on content analysis of party manifestos released before elections from 1945 to 1998.[17] Higher values for this variable indicate a more right-wing orientation. Examples from the UK may help the reader calibrate this variable. In 1978, James Callaghan's Labour government receives an ideology score of -27.5. In 1988, Margaret Thatcher's Conservative government scores 30.5. In 1998, Tony Blair's "new" Labour government receives a score of 8.07.

We map Martin and Stevenson's coding of parties onto governments by taking a weighted average of the parties in the government coalition. Each party's weight is the fraction of seats it has within the coalition. Suppose there are two parties in government. Party A, which scores -10 on the ideology index, has 45 seats; and Party B, scoring 1, has 20 seats. The government coalition thus controls 65 seats total. Party A has 45/65 = 9/13 of the coalition and Party B has 20/65 = 4/13, meaning that the government's score will be 9/13*(-10) + 4/13*1 = -6.615. Note that our measure of ideology is not influenced by the number of seats the government controls (which would be the case if we weighted the parties by seat share in the legislature.)

The most leftwing government in our sample is Austria in 1971, with a ideology score of -46.4. The most right-wing is Iceland (1975-77) with a score of 61.1. Over time, Norway has the most left-wing governments (mean ideology of -22.5), and Iceland has the most right-wing (mean of 17.8). The sample mean of ideology is -4.06, which is most closely approximated on average by France (mean -4.27). The most ideologically stable country is Ireland with a spread of only 21.2 points between its most right-wing (11.9) and left-wing governments (-9.3). The most ideologically variance occurs in Iceland, with a spread of 80.5 points (followed by Austria with a spread of 73.7and Denmark with a spread of 71.6).

We also control for socio-economic conditions. Specifically, we include unemployment, GDP, and trade openness. In preliminary analyses, we also controlled for population, but this was never significant (probably due to .92 correlation with GDP), so it was dropped. We tried

[17] The Martin-Stevenson ideology variable RILE, or "right-left position of party," is compiled from party statements on issues identified by Michael Laver and Ian Budge (1992) to have particular ideological meaning. These include military, democracy, constitutionalism, political authority, free enterprise, incentives, protectionism, economic orthodoxy, welfare state limitation, national way of life, traditional morality, law and order, social harmony, anti-imperialism, military, peace, internationalism, freedom and human rights, economic planning, controlled economy, nationalization, welfare state expansion, education expansion, and labor groups. The variables represent the percentage of quasi-sentences in a manifesto in each category, with the total number of quasi-sentences in each manifesto as the denominator of the fraction. See Martin and Stevenson 2001 for more details.

several specifications of GDP, the value itself, its natural log, and GDP per capita. The log specification was by far the most stable and significant, so that is what is reported here.

We measure openness of the economy as Imports + Exports, divided by GDP. Many studies (Cameron 1978; Rodrik 1998; Burgoon 2001; Garrett and Mitchell 2001) have found that more open economies have larger public sectors.

6. Results

We ran a series of regressions, adding successive control variables, to test the effects of the number of parties on government spending. The dependent variable, size of the public sector is the same in all regressions. Because our data is a cross sectional time series, all results give panel corrected standard errors (Beck and Katz 1995.)

Table 3 examines the effects of number of parties, party system concentration and ideology on the size of the public sector without controls. As columns 3a and 3b show, both predicted effects hold. An additional party in government results in an extra 1.55% of GDP spent by the public sector. Similarly, an increase in concentration (a decrease in the fragmentation) of the party system causes a notable decrease in the amount of government spending.

Column 3c shows the bivariate effect of ideology on the size of the public sector. The conventional wisdom is that left governments spend more than right governments, because voters on the left worry more about unemployment than about inflation (Hibbs 1977; 1987). The rational expectations variant of political business cycle theorizing dismisses the possibility of permanent effects on output and unemployment, but this is because inflation cancels out the effects of that increased spending; not because the left doesn't spend more (Alesina and Roubini 1992). Yet another influential view is that left governments will tend to spend more, but that this greater spending need not lead to economically inferior outcomes if the spending is on future investments such as human capital, and if the government has the tax revenue to keep the government deficit under control (Garrett and Lange 1989; Alvarez, Garrett, and Lange 1991; Garrett 1998).

In our data, however, the effect of left leaning governments on spending is borderline ($p = .13$), but more important, the sign is the opposite of conventional wisdom, with more conservative governments spending a higher fraction of GDP in the public sector. The unexpected direction of the effect of ideology is not a problem for our theory, which is agnostic about this variable. We report the bivariate results simply to show that an unexpected sign is present in the raw correlation between ideology and the size of the public sector – it does not arise from any relationship between the ideology variable and number of parties or party system concentration.

As mentioned, number of parties and party system concentration are rather highly correlated, so in Tables 4 and 5 analyze the effect of each without the other, but with progressively larger sets of other control variables. Table 4 focuses on the number of parties in government, which remains significant and positive when ideology and economic conditions are controlled for.

When we include an interaction of parties and ideology (column 4b), the main effect of ideology takes the expected sign (negative), and its significance level increases. The interaction term is highly significant, and positive. Our interpretation is that left-wing governments do spend more, but right-wing governments are more sensitive to increases in coalition size. This could be due to parties on the left *all* appealing to a single rather large group (labor), whereas parties on the right appeal to a wider range of social groupings, such as farmers, small business owners,

managers, skilled workers, and so on. As we will see below, the finding that rightwing governments spend more as they include more parties is fairly robust, but the main effect of left-wing governments spending less is not. We will develop this issue further as we go along.

Column 4c shows that the basic effects of number of parties, ideology and their interaction are reduced in magnitude, but retain their signs and high significance levels when the economic control variables are added. Note at this point that we go from explaining very little of the variance in the data overall to about fifty percent.

Table 5 duplicates the regressions of Table 4, replacing number of parties in government with the concentration of the party system, both as the main variable of interest and as an interaction with ideology. The effects of system concentration are substantively quite similar to those of number of parties in government. A more concentrated party system produces a smaller public sector, controlling for government ideology and economic conditions. But now the main effect of ideology remains contrary to conventional wisdom, even we allow ideology to interact with concentration. More conservative governments spend a higher fraction of GDP. The interaction of concentration and ideology is significant and negative, indicating that government spending is more sensitive to party system concentration when right-wing governments are in power. As was the case with number of parties, the effect of system concentration is more intense in right-wing governments. As in Table 4, the effects of party system and ideology are somewhat diminished in magnitude by the addition of economic control variables, but the signs and significance levels are unaffected.

Table 6 presents regressions that include both number of parties in government and party system concentration. Despite the fairly high correlation between these two variables, both remain significant as main effects, even when ideology and economic conditions are controlled for. The more parties there are in government, the greater the fraction of GDP it spends. Controlling for this effect, the more fragmented the party system, that is, the narrower the constituencies of individual parties, the more government spends.

The effect of the interaction between ideology and number of parties also remains significant, but the interaction between ideology and concentration does not. The main effect of ideology also becomes unstable once the interaction terms are included. Given the high levels of colinearity created by the multiple interaction terms, this is not too surprising.

Table 7 examines the robustness of our results. The first three columns include a lagged dependent variable. Like most macroeconomic series, our dependent variable has a high degree of serial correlation. Much of the variance in the size of the public sector in year t can be explained by the size of the public sector in $t - 1$. Controlling for this, do the number of parties in government and the concentration of the party system exert detectable influences on the size of the public sector? Yes, in the case of number of parties, which, though reduced in magnitude, remains positive and significant, even when concentration is also included. The effect of concentration holds up less well. The main effect loses statistical significance with the addition of the lagged dependent variable and vanishes completely when number of parties in government is also controlled for in 7c. The interactions of number or parties and concentration with ideology do not remain significant when the lagged dependent variable is included, although the concentration/ ideology interaction is borderline.

In columns 7d-g, we control for fixed effects by country, with and without the lagged dependent variable. That is, we control for the possibility that Belgium, for example has a large public sector because of some other aspect of Belgium's culture, economy or institutions, not because it

typically has large coalitions. Because both number of parties in government and party system concentration vary more across countries than they do within a given country, the inclusion of the fixed effects constitutes an extremely difficult test for our theory. Continuing the Belgium example, the country effects essentially *presume* that Belgium's large public sector is due to its Belgium-ness, not to the fact that its coalitions are large relative to other countries. But even knocking out cross-country variance that is in fact relevant to our theory, we find that the effect of number of parties in government stays highly significant, and of respectable magnitude. The additional 0.31% (from Column 7f) of GDP implied by adding a party to an ideologically neutral coalition is a large amount of money. (We discuss magnitudes systematically just below.)

Overall, the impact of the country effects, and (in column 7h, time effects as well) on other variables is similar to that of the lagged dependent variable. Number of parties stays significant throughout as a main effect, concentration does not. The interactions of ideology with party system concentration and with number of parties in government both remain significant when the other is not included, but only the concentration interaction is significant when both are in the same regression. Once country effects are controlled for, changes in the number of parties in government will closely track changes in party system concentration, so it is not surprising that only one of these variables would be significant.

The overall point of Table 7 is that the overall effect of number of parties persists even when we "over control" for lagged dependent variables, country effects and time effects. Even when we include control variables that (a) have unclear theoretical interpretations, and (b) absorb variance that is germane to our theory, an increase in the number of parties in government significantly increases the size of the public sector..

7. Is the Effect of Coalition Size Big Enough to Matter?

Another important question is whether the effect number of parties in government is substantively large enough to care about. Table 8 addresses this question by reporting the total effects of number of parties and of party system concentration. The fact that these variables interact with ideology means that the impact will be different for governments of different ideological orientation. Table 8 considers three hypothetical governments: a centrist government, which has the median ideology value in our sample (-5.75 for Austria 1980); a left-wing government like our 25th percentile value (-18.8, Sweden 1983), and a right-wing government similar to our 75th percentile value of 6.77. The observation at the 75th percentile is actually UK 1979, a weighted average of Margaret Thatcher's Tory government and James Callaghan's Labour government, but a close reference value would be Italy 1988 (ideology =7.9). The calculations use the actual 75% percentile figure of 6.77.

The first set of figures in Table 8 show the total impact of an additional party in government for the three ideological orientations in terms of percentage of GDP spent in the public sector. The second set translates these percentages into billions of dollars, assuming GDP is at the 1995 sample average of 492 billion. The estimated impacts are calculated using the coefficients from regressions 4(c) and 5(c). We think that the most accurate (though not the most conservative) estimates come from the regressions that do not include country effects or the lagged DV. In calculating the effect of number of parties, we use estimates from the regression that does not include system concentration (and vice versa), because one generally cannot hold one of these variables constant while allowing the other to vary.

The magnitudes are impressive. Adding a typical party from the ideological center of our sample, *ceteris paribus*, leads to almost as much (.85%) additional public sector spending as an additional

percentage point of GDP, and exceeds the impact of a three percentage point increase in unemployment. In our sample, this would have amounted to an additional 4.2 billion dollars on average in 1995. For a right-wing coalition, the total impact of an additional party is an additional 1.51% of GDP, the 1995 equivalent of an extra 7.4 billion dollars. Even for left-wing governments which are less sensitive to government size, the predicted increase is an additional 0.18%, or 790 million dollars, per additional party.

The lower panel in Table 8 displays the total effects for a one standard deviation increase (0.101) in party system concentration. The one standard deviation increase corresponds very roughly to the difference between the average values for moderately-concentrated Sweden and highly concentrated Spain, or highly fragmented Finland. The impact of such an increase is slightly larger than the impact of an additional party for all types of governments.

The differences in the total impact of an additional party (or a decrease in concentration) for different ideological orientations is so pronounced as to require some comment, even though, as we have emphasized, it neither follows from nor contradicts our theory. We conjectured above that this could be due to parties on the left all basically targeting the same large group (labor), while (at least in fragmented systems) parties on the right tend to carve out narrower constituencies (farmers, big business, etc.). Note we are not saying that leftwing governments are more likely to include fewer parties. The correlation between ideology and number of parties (or concentration) in our sample is essentially zero. Rather, we are saying that, in the time period we study, the European left was more ideological cohesive than the right.

How might the notion of "ideological cohesiveness" fit with the multi-dimensional model we propose here? Bawn (1999) has argued that the "long coalitions" logic that Aldrich (1995) and Schwartz (1989) applied to parties applies in a somewhat looser way to ideology. As discussed above, part of our project here is to extend the Aldrich-Schwartz logic to a world in which the long coalitions engage in shorter coalitions to form multi-party governments. Can we extend the extension to ideology in this context, or are we, so to speak, overextending? If a party as a long coalition can cause each constituent group to internalize costs borne by other constituent groups, a cohesive ideology may cause groups covered in the ideology's sense of "us" to similarly internalize each other's costs, though perhaps only partially. Because long ideological coalitions are shaped only by the logic of repeat play (as opposed to long partisan coalitions, which are shaped by electoral and legislative rules), it is not surprising that we should see differing levels of cohesiveness on the left and right.[18]

Concretely, our conjecture that the left is more ideologically cohesive implies that an additional party in a left-wing government leads to a smaller increase in spending because the existing parties' policy targets had already internalized (out of ideological solidarity) some costs borne by the new party's support groups. Different groups in the broad "labor" coalition internalize more of each other's costs than do farmers, big business, and other groups on the right.[19]

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[18] See Bawn 1999 for an elaboration of the various forms that ideological long coalitions can take.

[19] In future work we would like to consider is to see how "ideology" influences the choice of coalition partners. In our framework, ideology could make some coalitions of parties more likely to occur than others, along the lines of Axelrod's Minimal Connected Winning Coalitions (1970). The left-right dimension clearly exists in PR systems as an important basis for political competition; all countries have, broadly construed, parties on the left and on the right. The other dimensions—they are many and varied—tend to support somewhat smaller parties but are nonetheless important enough in the coalitional bargaining process to undermine the usefulness of a single dimension as a way of organizing political competition. The strength of the left-right continuum across types of electoral systems speaks to the importance of

8. Implications and Discussion

We have argued that the number of parties in government matters for policy, holding constant the number of groups represented. When a government "coalition" is a single party, it is accountable for all policy decisions. If it wants to stay in power, it must appeal to a broad constituency. Because it wants the support of a large number of groups, a large party will internalize a greater fraction of costs of government programs. Members of multiparty coalition governments, on the other hand, can associate themselves with some issues and distance themselves from others via the priorities established in platforms and campaigns. When the party system is sufficiently fragmented, splinter parties can maintain a reasonable chance of being in government merely by appealing to their respective narrow constituencies, externalizing all costs borne by other groups. Because coalition parties implement more efficient logrolls, voters are overall better off in consolidated party systems; but proportional electoral systems limit the degree of feasible consolidation.

The theoretical framework developed here emphasized strategic behavior by groups in a multidimensional policy space. We conceptualized policy choices in terms of projects in a way that was used initially to study pork barrel legislation in the U.S. (Weingast 1979, Weingast, Shepsle and Johnsen 1981), and later extended to understand majority parties (Schwartz 1989, Aldrich 1995). We further extended this framework here to a comparative context in order to understand how multi-party coalitions behave differently from single-party coalitions. This exercise yielded not only a clear prediction about how the number of parties in government affects the size of the public sector, but also several other implications that seem broadly consistent with the reality of European politics. Specifically, our model predicts that the observed dimensionality of political competition should be higher in countries with more parties. It implies that groups will be more salient in PR systems simply because they are more likely to be represented by their own party, as opposed to having their identity obscured by a coalition party.[20] Finally, it identifies an incentive to consolidate in PR systems that is consistent with the existence of explicit coalition parties in PR systems, such as the CDU and SPD in Germany.[21]

Our model's specific prediction that the policies of multiparty governments will externalize more costs is likely to be manifested in regulatory policies as well as the size of the public sector. While we have not looked at this directly, there evidence consistent with this claim. For example, the literature on the "varieties of capitalism"[22] identifies "coordinated market economies" as those that provide workers with the necessary wage security that enables them to invest in firm- or industry-specific skills. Firms, in turn, are able to accommodate workers' needs because government regulation buffers their profits at least to some degree from the vagaries of market swings. Consistent with our model, these coordinated economies are all PR systems, routinely governed by coalitions of parties with fairly narrow support bases. Our logic implies

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retrospective voting on the basis of income as an electoral motive. The environment, religion, race, or social values seem to galvanize smaller groups of voters, all else equal.

[20] Myerson (1993) and Cox (1997) have shown that the calculus of mobilization in PR systems puts a premium on the political usefulness of groups.

[21] The CDU was formed post-WWII as an explicit "union" of interests that had been represented by different parties in the Weimar era. The SPD made an explicit decision in the late 1950's to be a "people's party" rather than a "worker's party." While Germany's electoral system uses single member districts to select 1/2 of the individuals elected to the Bundestag, these seats do not affect party strength. Because seat shares are proportional, the SMD races cannot create a incentive to consolidate at the party system level (Bawn 1993).

[22] See the book by the same title, edited by Peter Hall and David Soskice, 2000.

that parties with broader bases of support would not support such extensive regulatory insulation from market pressures, because of the diffuse costs (prices, unemployment.) Along similar lines, Rogowski and Kayser (2002) have found that more proportional electoral systems are associated with higher levels of consumer prices.

Somewhat less directly related is Persson and Tabellini's (1999) finding that SMD countries are associated with a somewhat lower supply of public goods—measured as the sum of expenditures on transportation, education, and order and safety, in percent of GDP. They interpret this as evidence that parties in SMD systems will maximally redistribute income to the marginal district and will not internalize the votes lost in non-marginal districts. Our model suggests an alternative explanation. At least some public goods are provided less in response to the diffuse demand of those who consume them, and more in response to the intense "demand" of organized groups who reap rents by, for example, contracting to build the bridge, staff the schools and police forces, etc. (Weingast, Shepsle and Johnsen, 1981). By promoting a less efficient logroll among the groups for whom the costs of the public good count as benefits, PR leads to higher levels of these public goods.

While our argument and evidence here are broadly consistent with the findings of others who have examined differences in policies and outcomes across systems, our claims about the theoretical mechanisms are different.[23] Scartascini and Crain (2002) found a similar effect for party concentration on the size of the public sector using a larger dataset, but their theoretical explanation rests on an assumption of norms of universalism in the legislature. Rogowski and Kayser focus on the trade-offs parties face between pro-consumer policies (which attract votes) and pro-producer policies (which attract money). Because major parties in more proportional systems usually face lower seats-votes ratios, they are more inclined to go after more money.[24] Persson and Tabellini's key assumption is that parties in SMD systems will maximally redistribute income to the marginal district and will not internalize the votes lost in non-marginal districts.[25]

Our theory differs from Persson and Tabellin's (and many others) in that it predicts differences *among* PR countries, based on the fragmentation of the party system and the number of parties in government, not just differences *between* PR and SMD. This difference is important because the data we analyze is dominated by proportional countries, and our basic results hold up even when country effects are controlled for. The effect of number of parties on the size of the public sector cannot be merely to differences between PR and SMD. It is important to note that Rogowski and Kayser's theory also predicts differences among PR countries, based on the seat-vote ratio, which is likely to be highly correlated with parties in government and system concentration. For this reason, neither our empirical analysis nor theirs constitutes a critical test of the two theories.

Finally, our findings about the socially-suboptimal effects of party system fragmentation in politically and economically developed countries resonates with studies of economic development that argue ethnically fragmented societies make worse policy choices and suffer worse macroeconomic outcomes than more ethnically homogeneous ones (Easterly and Levine

[23] Though for a similar argument, see Rosenbluth and Schaap, 2001.
[24] Bawn and Thies (2003) make a similar theoretical point, although they view the support of organized interest as a means of getting more votes.
[25] Persson and Tabellini offer a richer model of SMD, one that carefully explores the implications of district heterogeneity, which we have ignored here. However, we believe that our multidimensional model captures electoral competition under PR more accurately than their model, which assumes a two-party system.

1997, see Posner 2003 for a review). The logic is similar to the model we developed here -- groups externalize costs borne by other groups – though the institutional mechanisms that connect group preferences to policy outcomes are not well-specified in that literature. Posner (2003), however, goes some distance toward specifying these mechanics, and shows that Easterly and Levine's "growth tragedy" finding holds up only when ethnic fragmentation is measured in a way that focuses on politically relevant, rather than all, ethnic groups.

We have offered a theoretical explanation for why groups support splinter parties, given that multiparty governments strike excessively costly bargains. And we have offered substantial empirical evidence that parties do pursue the cost-externalizing strategies we have assumed here. Coalition governments do spend more than single-party governments, and the more parties are in the coalition and the narrower the constituencies of the individual parties, the more they spend. What we have not yet demonstrated as precisely as we would like is why parties pursue the strategies that lead to these inefficient bargains. Indeed, sometimes they may not. Hallerberg and von Hagen (1999) and Hallerberg (forthcoming) identify strategies that some coalition governments use to combat the incentive to overspend. Some governments negotiate "treaties" up front that include detailed spending targets ("commitment"), while others assign the budget and finance portfolios to fiscally conservative parties ("delegation"), and both of these strategies lead to less spending. But many coalition governments choose not to adopt these strategies, and even among those that do, it is not clear how much the commitment and delegation strategies offset the incentive to overspend. Preliminary analysis of our data shows even among the subset of governments that adopt commitment or delegation strategies, more fragmented party systems produce higher public sectors. We hope in future work to focus more closely on the electorally-induced goals and constraints of parties in coalition governments.

References

Alesina, Alberto and Nouriel Roubini. 1992. "Political Cycles in OECD Countries." *The Review of Economic Studies* 59(4): 663-688.

R. Michael Alvarez; Geoffrey Garrett; Peter Lange. 1991. "Government Partisanship, Labor Organization, and Macroeconomic Performance." *American Political Science Review*. 85(2): 539-556.

Axelrod, Robert. 1970. *Conflict of Interest*. Chicago: Markham.

Bawn, Kathleen. 1993. "The Logic of Institutional Preferences: German Electoral Law as a Social Choice Outcome." *American Journal of Political Science* 37: 965-989.

Bawn, Kathleen. 1999. "Constructing Us: Ideology, Coalition Politics and False Consciousness." *American Journal of Political Science* 43(2): 303-334.

Burgoon, Brian. 2001. "Globalization and Welfare Compensation: Disentangling the Ties that Bind," *International Organization* 55(3): 509-551.

Chhibber, Pradeep and Ken Kollman. 1998. "Party Aggregation and the Number of Parties in India and the United States." *American Political Science Review* 92(2):329-342.

Cox, Gary. 1990. "Centripetal and Incentive to fragments in Electoral Systems," *American Journal of Political Science* 34: 903-35.

Cox, Gary. 1997. *Making Votes Count: Strategic Coordination in the World's Electoral Systems*. Cambridge: Cambridge University Press.

Cox, Gary. 1999. "Electoral Rules and the Calculus of Mobilization," *Legislative Studies Quarterly*, 24,3: 387-419.

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

Druckman, James and Paul Warwick. 2001. "Portfolio Salience and the Proportionality of Payoffs in Coalition Governments," Working Paper.

Duverger, Maurice. 1954. *Political Parties*. New York: John Wiley and Sons.

Ferejohn, John. 1993. "The Spatial Model and Elections," in Bernard Grofman, ed., *Information, Participation, and Choice*. Ann Arbor: University of Michigan Press. Pp. 107-24.

Frymer, Paul. 2000.

Garrett, Geoffrey and Peter Lange. 1989. "Government Partisanship and Economic Performance: When and How does 'Who Governs' Matter?" *Journal of Politics* 51(3): 676-693.

Garrett, Geoffrey and Deborah Mitchell. 2001. "Globalization, Government Spending and Taxation in the OECD," *European Journal of Political Research* 39: 145-77.

Hall, Peter, and David Soskice. 2000. *The Varieties of Capitalism: The Institutional Foundations of Comparative Advantage*. Oxford: Oxford University Press.

Hallerberg, Mark. Forthcoming. *The Treat of Maastricht and the Making of Budgets in Europe, 1973-2002.*

Hallerberg, Mark and Jurgen von Hagen. 1999. "Electoral Institutions, Cabinet Negotiations, and Budget Deficits in the European Union," in James Poterba and Jurgen von Hagen, *Fiscal Institutions and Fiscal Performance*. University of Chicago Press.

Hibbs, Douglas. 1977. "Political Parties and Macroeconomic Policy." *American Political Science Review* 71(4): 1467-1487.

Hinich, Melvin, and Michael Munger. 1994. *Ideology and the Theory of Political Choice.* Ann Arbor: University of Michigan Press.

Huber, John, and Bingham Powell. 1994. "Congruence between Citizens and Policymakers in Two Visions of Liberal Democracy," *World Politics.* 46/April: 291-326.

Kalandrakis, Tasos. 2001. "On the Centrality of Policy Outcomes in Dynamic Majoritarian Bargaining Games," Yale Working Paper.

Laver, Michael, and Norman Schofield. 1990. *Multiparty Government: The Politics of Coalition in Europe*. Oxford: Oxford University Press.

Laver, Michael, and Kenneth Shepsle, eds. 1994. *Cabinet Ministers and Parliamentary Government.* New York: Cambridge University Press.

Laver, Michael, and Kenneth Shepsle. 1996. *Making and Breaking Governments: Cabinets and Legislatures in Parliamentary Democracies*. New York: Cambridge University Press.

Leiserson, Michael. 1966. *Coalitions in Politics.* Ph.D. Yale University.

Lijphart, Arend. 1977. *Democracy in Plural Societies*. Yale University Press.

Lijphart, Arend. 1984. *Democracies: Patterns of Majoritarian and Consensus Government in Twenty-one Countries.* Yale University Press.

Martin, Lanny and Randolph Stevenson. 2001. "Government Formation in Parliamentary Democracies," *American Journal of Political Science.* 45/1: 33-50.

McGillivray, Fiona. 1997. "Party Discipline as a Determinant of the Endogenous Formation of Tariffs," *American Journal of Political Science*. 41,2: 584-607.

McGillivray, Fiona. Forthcoming 2004. *Privileging Industry: The Comparative Politics of Trade and Industrial Policy.* Princeton: Princeton University Press.

Myerson, Roger. 1993. "Incentives to Cultivate Favored Minorities Under Alternative Electoral Systems," *American Political Science Review.* 87,4: 856-69.

Persson, Torsten, and Guido Tabellini. 1999. "The Size and Scope of Government: Comparative Politics with Rational Politicians," *European Economic Review* 43: 699-735.

Persson, Torsten, and Guido Tabellini. 2001. "Political Institutions and Policy Outcomes: What Are the Stylized Facts?" IIES Working Paper.

Powell, G. Bingham, and Georg Vanberg. 2001. "Election Laws, Disproportionality and Median Correspondence: Implications for Two Visions of Democracy," *British Journal of Political Science*, 30.

Powell, G. Bingham, and Guy D. Whitten. 1993. "A Cross-National Analysis of Economic Voting: Taking Account of the Political Context," *American Journal of Political Science* 37/May: 403.

Riker, William. 1962. *The Theory of Political Coalitions.* New Haven: Yale University Press.

Riker, William. 1982. "The Two Party System and Duverger's Law," *American Political Science Review* 64: 179-81.

Rodrik, Dani. 1998. "Why Do More Open Economies Have Bigger Governments?" *Journal of Political Economy*. 106(5): 997-1032.

Rogowski, Ronald. 1987. "Trade and the Variety of Democratic Institutions," *International Organization.* 41(2): 203-23.

Rogowski, Ronald, and Mark Kayser. 2002. "Majoritarian Electoral Systems and Consumer Power: Price-Level Evidence from the OECD Countries." *American Journal of Political Science* 46(3): 526-539.

Rosenbluth, Frances, and Ross Schaap. 2003. "The Domestic Politics of Banking Regulation," *International Organization*. 57/Spring: 307-336.

Schwartz, Thomas. "Representation as Agency and the Pork Barrel Paradox," *Public Choice* 78: 3-21.

Thies, Michael. 2001. "Keeping Tabs on One's Partners: The Logic of Delegation in Coalition Formation," *American Journal of Political Science*.

Von Neumann, I., and O. Morgenstern. 1958. *Theory of Games and Economic Behavior*. Princeton: Princeton University Press.

Weingast, Barry, Kenneth Shepsle, and Christopher Johnsen. 1981. "The Political Economy of Benefits and Costs: A Neoclassical Approach to Distributive Politics," *The Journal of Political Economy*. 89(4): 642-664.

Wright, Gerald and Brian Schaffner. 2002. "The Influence of Party: Evidence from the State Legislatures," *American Political Science Review* 96/2:367-77.

Zaller, John. 2002. "Floating Voters in U.S. Presidential Elections, 1947-2000," Working Paper.

Table 1: Maximally Fragmented Party System (MFPS) versus Balanced Two-Party System (BTPS)

	MFPS	BTPS
Parties in Government	$\frac{n}{2}$	1
Probability Group Represented in Government	.5	.5
Expected Utility of Group, *ex ante*	$\frac{n}{4} - \frac{n^2}{8}$	0
Size of Public Sector	$\frac{n^3}{8}$	$\frac{n}{2}$

Table 2: Summary of Data

Country	Years in Sample	Average Number of Parties
Austria	1970-1997	1.52
Belgium	1973-1997	4.42
Denmark	1973-1995	2.32
Finland	1973-1997	4.09
France	1979-1996	1.61
Germany	1992-998	2
Greece	1975-1994	1.03
Iceland	1972-1997	2.41
Ireland	1981-1996	1.89
Italy	1973-1997	3.68
Luxemburg	1975-1997	2
Netherlands	1973-1997	2.74
Norway	1972-1997	1.39
Portugal	1985-1996	1.08
Spain	1980-1996	1
Sweden	1970-1998	1.61
UK	1971-1998	1

Table 3: Bivariate Effects of Number of Parties in Government, Party System Concentration, and Ideology on Fraction of GDP in Public Sector

	(3a)	(3b)	(3c)
Government Parties	1.55		
	(.232)		
	0.00		
Concentration		-18.5	
		(2.53)	
		0.00	
Ideology			.0287
			(.0180)
			0.11
Constant	36.1	45.0	39.5
	(.631)	(1.15)	(.574)
	0.00	*0.00*	*0.00*
N	355	355	355
R2	0.07	0.06	.0005

Panel-corrected standard errors are in parentheses below each coefficient; *p*-values in italics.

Table 4: Effect of Number of Parties in Government on Size of Public Sector

	(4a)	(4b)	(4c)
Government Parties	1.56	2.03	1.15
	(0.230) *0.00*	(0.208) *0.00*	(0.156) *0.00*
Ideology	0.0295	-0.0953	-.0665
	(0.0183) *0.11*	(0.0221) *0.00*	(0.0196) *0.00*
Ideology*Parties		0.0651	0.0526
		(0.0126) *0.00*	(0.00927) *0.00*
GDP (log)			2.71
			(0.227) *0.00*
Unemployment			0.242
			(0.0793) *0.00*
Trade Openness			12.6
			(1.15) *0.00*
Constant	36.2	35.3	-44.0
	(0.646) *0.00*	(0.667) *0.00*	(6.18) *0.00*
N	355	355	355
R2	0.07	0.12	0.51

Panel-corrected standard errors are in parentheses below each coefficient; *p*-values in italics.

Table 5: Effect of Party System Concentration on Size of Public Sector

	(5a)	(5b)	(5c)
Concentration of Party System	-19.1 (2.64) *0.00*	-20.2 (2.42) *0.00*	-12.4 (2.41) *0.00*
Ideology	0.0361 (0.0185) *0.05*	0.167 (0.0523) *0.00*	0.214 (0.0349) *0.00*
Ideology*Concentration		-.418 (0.136) *0.00*	-.564 (0.103) *0.00*
GDP (log)			2.89 (0.228) *0.00*
Unemployment			0.248 (0.0813) *0.00*
Trade Openness			12.7 (1.26) *0.00*
Constant	45.4 (1.16) *0.00*	45.8 (1.06) *0.00*	-42.3 (6.30) *0.55*
N	355	355	367
R2	0.07	0.08	0.52

Panel-corrected standard errors are in parentheses below each coefficient; *p*-values in italics.

Table 6: Effect of Parties in Government and Concentration of Party System together on Size of Public Sector

	6(a)	6(b)	6(c)	6(d)
Govt. Parties	1.04 (0.288) *0.00*	1.00 (0.300) *0.00*	1.64 (0.329) *0.00*	0.687 (0.281) *0.01*
Concentration	-9.14 (3.22) *0.01*	-10.1 (3.53) *0.00*	-6.91 (3.70) *0.06*	-6.79 (3.73) *0.07*
Ideology		0.0332 (0.0189) *0.08*	-0.128 (0.0841) *0.13*	0.0930 (0.0814) *0.25*
Ideo*Parties			0.0681 (0.0177) *0.00*	0.0279 (0.0158) *0.08*
Ideo*Concentration			0.0959 (0.185) *0.60*	-0.353 (0.178) *0.05*
GDP (log)				2.82 (0.231) *0.00*
Unemployment				0.236 (0.0798) *0.00*
Trade Openness				12.5 (1.23) *0.00*
Constant	40.0 (1.64) *0.00*	40.5 (1.79) *0.00*	38.2 (1.89) *0.00*	-43.6 (6.34) *0.00*
N	355	355	355	355
R2	0.08	0.09	0.12	0.52

Table 7: Robustness of Effects of Number of Parties in Government and Party System Concentration on Size of Public Sector

	Lagged Dependent Variable			Country Effects				Country and Time Effects
	7(a)	7(b)	7(c)	7(d)	7(e)	7(f)	7(g)	7(h)
Govt. Parties	0.226		0.220	0.810		0.703	0.309	0.344
	(0.0955)		(0.117)	(0.262)		(0.276)	(0.139)	(0.160)
	0.01		*0.06*	*0.00*		*0.01*	*0.03*	*0.03*
Concentration		-2.20	-0.134		-4.04	-0.161	-1.70	-2.84
		(1.36)	(1.68)		(5.21)	(5.29)	(3.46)	(3.28)
		0.11	*0.94*		*0.44*	*0.98*	*0.62*	*0.39*
Ideology	-.0227	0.0172	0.0342	-0.0792	0.164	0.109	0.0419	0.0530
	(0.0118)	(0.0191)	(0.0327)	(0.0247)	(0.0318)	(0.0710)	(0.0371)	(0.0403)
	0.05	*0.37*	*0.30*	*0.00*	*0.00*	*0.12*	*0.26*	*0.19*
Ideo*Parties	0.00486		-0.00326	0.0405		0.0131	-0.00186	0.00
	(0.00470)		(0.00593)	(0.00934)		(0.0137)	(0.00705)	(0.01)
	0.30		*0.58*	*0.00*		*0.34*	*0.79*	*0.97*
Ideo*Concentration		-0.0958	-0.131		-0.525	-0.430	-0.165	-0.251
		(0.0645)	(0.0822)		(0.102)	(0.152)	(0.0939)	(0.0890)
		0.14	*0.11*		*0.00*	*0.00*	*0.08*	*0.01*
GDP (log)	0.267	0.307	0.298	4.24	4.60	4.55	-0.875	-3.84
	(0.108)	(0.112)	(0.113)	(1.46)	(1.42)	(1.43)	(0.977)	(2.03)
	0.01	*0.01*	*0.01*	*0.00*	*0.00*	*0.00*	*0.37*	*0.06*
Unemployment	-0.0396	-0.0370	-.0415	1.00	1.05	1.02	0.139	0.179
	(0.0241)	(0.0239)	(0.0243)	(0.0948)	(0.0953)	(0.0970)	(0.0654)	(0.0707)
	0.10	*0.12*	*0.09*	*0.00*	*0.00*	*0.00*	*0.03*	*0.01*
Trade Openness	1.60	0.245	0.267	-2.63	-4.09	-3.56	-3.86	-4.02
	(0.466)	(0.452)	(0.451)	(3.11)	(3.22)	(3.17)	(1.62)	(1.56)
	0.73	*0.59*	*0.55*	*0.40*	*0.20*	*0.26*	*0.02*	*0.01*
Lagged Size of	0.914	0.913	0.912				0.806	0.705
Public Sector	(0.0222)	(0.0228)	(0.0225)				(0.0474)	(0.0404)
	0.00	*0.00*	*0.00*				*0.00*	*0.00*
Constant	-3.58	-3.43	-4.23	-76.5	-82.7	-84.3	32.4	107
	(2.54)	(2.38)	(2.44)	(38.3)	(37.0)	(37.4)	(25.0)	(52.3)
	0.16	*0.25*	*0.08*	*0.03*	*0.03*	*0.02*	*0.19*	0.04
N	338	338	338	355	355	355	338	338
R2	0.92	0.92	0.92	0.80	0.80	0.81	0.93	0.95

Table 8: Magnitudes of the Total Effects of Number of Parties in Government and Party System Concentration on the Size of the Public Sector (Examples defined relative to sample)

	Left Govt. (25^{th} %-ile)	Centrist Govt. (Median)	Right Govt. (75th %-ile)
Ideology Score	-18.8	-5.75	6.77
Example	*Sweden 1983*	*Austria 1980*	*Italy 1988*[26]
Impact of One Additional Party in Govt.			
Extra % GDP in Public Sector	0.16	0.85	1.5
Extra Spending (Bil $)	0.79	4.2	7.4
Impact of One Standard Deviation Decrease in Party System Concentration			
Extra % GDP in Public Sector	0.18	0.92	1.6
Extra Spending (Bil $)	0.89	4.5	7.9

Estimated impact of number of parties in government from regression 4(c). Estimated impact of system concentration from regression 5(c).

[26] Italy 1988-90 is actually slightly above the 75% percentile (ideology =7.9). The observation at the 75^{th} percentile is actually UK 1979, the year that Margaret Thatcher's Tory government succeeded James Callaghan's Labour government. The calculations use the actual 75% percentile figure of 6.77.

Figure 1: SMD with Consolidated Opposition.
No Incentive to Fragment

Group 1: Consolidate

		Group 3: Consolidate		Group 3: Fragment	
Group 2	Consolidate	(a) 0 0 0	0	(b) -1/2 -1/2	-1/2
	Support D	(c) -1/2 -1/2	-1/2	(d) -1/2 -1/2	-1/2

Group 1: Fragment

		Group 3: Consolidate		Group 3: Fragment	
Group 2	Consolidate	(e) -1/2 -1/2	-1/2	(f) -1/2 -1/2	-1/2
	Fragment	(g) -1/2 -1/2	-1/2	(h) -1/2 -1/2	-1/2

Nash equilibria: Cell (a) is the unique NE

Note on depiction of three-person games: Group 1 chooses top or bottom panel, group 2 chooses row and group 3 chooses column. Group 1's pay-offs are in the center of the cell, group 2's in the lower left and group 3's in the upper right.

Figure 2(a): SMD with Fragmented Opposition
Moderately Strong Incentive to Consolidate

Group 1: Consolidate

			Group 3 Consolidate		Group 3 Fragment	
			(a) 1/2 1/2 ½		(b) 1/2 1/2 1/2	
Group 2	Consolidate					
			(c) 1/2 1/2 ½		(d) -3/4 -7/6 -3/4	
	Fragment					

Group 1: Fragment

			Group 3 Consolidate		Group 3 Fragment	
			(e) 1/2 1/2 ½		(f) -3/4 -3/4 -7/6	
Group 2	Consolidate					
			(g) -7/6 -3/4 -3/4		(h) -1 -1 -1	
	Fragment					

Nash equilibria: Cells a, b, c, e and h.

Figure 2(b): SMD with Submajority Opposition
Incentive to Consolidate Destabilizes Submajority Party

Groups 1and 2 support submajority coalition party A′. Group 3 fragments. Do 4, 5 and 6 consolidate to support Party B?

Group 4: Consolidate

		Group 6: Consolidate		Group 6: Fragment	
Group 5: Consolidate		(a) 1/2 1/2 ½		(b) -1/8 -1/8 -1/8	
Group 5: Fragment		(c) -1/8 -1/8 -1/8		(d) -3/4 -3/4 -3/4	

Group 4: Fragment

		Group 6: Consolidate		Group 6: Fragment	
Group 5: Consolidate		(e) -1/8 -1/8 -1/8		(f) -3/4 -3/4 -3/4	
Group 5: Fragment		(g) -3/4 -3/4 -3/4		(h) -3/4 -3/4 -3/4	

Nash equilibria: Cell a.

Figure 3: PR with Consolidated Opposition
Strong to Incentive to Fragment

Group 1: Consolidate

		Group 3 Consolidate		Group 3 Fragment	
Group 2	Consolidate	(a) 0 0 0		(b) 17/54 -43/54 -43/54	
	Fragment	(c) -43/54 -43/54 17/54		(d) -3/8 -9/8 -3/8	

Group 1: Fragment

		Group 3 Consolidate		Group 3 Fragment	
Group 2	Consolidate	(e) -43/54 17/54 -43/54		(f) -3/8 -3/8 -9/8	
	Fragment	(g) -9/8 -3/8 -3/8		(h) -7/8 -7/8 -7/8	

Nash equilbria: Cell h.

Figure 4: PR with Fragmented Opposition
Moderate Incentive to Consolidate

Group 1: Consolidate

		Group 3: Consolidate		Group 3: Fragment	
Group 2: Consolidate		(a) -5/8 -5/8 -5/8		(b) -11/24 -23/24 -23/24	
Group 2: Fragment		(c) -23/24 -23/24 -11/24		(d) -32/15 -103/30 -32/15	

Group 1: Fragment

		Group 3: Consolidate		Group 3: Fragment	
Group 2: Consolidate		(e) -23/24 -11/24 -23/24		(f) -32/15 -32/15 -103/30	
Group 2: Fragment		(g) -103/30 -32/15 -32/15		(h) -3 -3 -3	

Nash equilbria: Cells b, c, e and h.

Figure 5: PR with Fragmented Opposition
Incentive to Consolidate to a Two-Party Coalition

		Group 2	
		Consolidate	Fragment
Group1	Consolidate	(a) -3/4 -3/4	(b) -27/20 -33/10
	Fragment	(c) -33/10 -27/20	(d) -3 -3

Nash equilbria: Cells a and d.

Figure 6: PR with Partly Consolidated Opposition
No incentive to form a second two-party coalition.

		Group 5: Consolidate		Group 5: Fragment	
Group 4	Consolidate	(a) -3/2		(b) -9/16	
		-3/2		-27/16	
	Fragment	(c) -27/16		(d) -3/2	
		-9/16		-3/2	

Nash equilbria: Cell d.

Figure 7: PR with Party Consolidated Opposition
No incentive to form a three-party coalition.

Group 4: Consolidate

		Group 6: Consolidate		Group 6: Fragment	
Group 5	Consolidate	(a) -11/18 -11/18 -11/18		(b) -11/36 -41/36 -41/36	
	Splinter	(c) -41/36 -41/36 -11/36		(d) -1 -7/4 -1	

Group 4: Fragment

		Group 6: Consolidate		Group 6: Fragment	
Group 5	Consolidate	(e) -11/36 -41/36 -41/36		(f) -1 -1 -7/4	
	Fragment	(g) -7/4 -1 -1		(h) -3/2 -3/2 -3/2	

Nash equilibrium: Cell h.