Party Strength, the Personal Vote, and Government Spending

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"Strong" political parties within legislatures are one possible solution to the problem of inefficient universalism, a norm under which all legislators seek large projects for their districts that are paid for out of a common pool. We demonstrate that even if parties have no role in the legislature, their role in elections can be sufficient to reduce spending. If parties in the electorate are strong, then legislators will demand less distributive spending because of a decreased incentive to secure a "personal vote" via local projects. We estimate that spending in states with strong party organizations is at least 4% smaller than in states where parties are weak. We also find evidence that strong party states receive less federal aid than states with weak organizations, and we theorize that this is because members of Congress from strong party states feel less compelled to secure aid than members from weak party states.

Numerous scholars have argued in favor of "strong" or "responsible" parties.[1] One rationale for strong parties relates to government spending. In a decentralized legislature, legislators have a natural tendency to engage in wasteful distributive politics, passing budgets that are too large and full of oversized projects. They do this because they face a common pool problem. If spending is targetable and taxes are broad-based, then each legislator receives a large benefit from spending directed towards his or her district but does not incur the full costs, leading to "inefficient universalism." This argument has its roots in the work of Weingast, Shepsle, and Johnsen (1981).

One solution to this problem is strong leadership within the legislative process. Practically, this is most likely to take the form of strong legislative party organizations. These strong party organizations will at least internalize the external costs borne by their memberships, and they may also suppress spending on items that mainly benefit nonmembers. The majority party typically has a total constituency of more than half of the population, so a large proportion of total project costs will be internalized. Cox and McCubbins (1993) argue along these lines: parties invest in "brand names," and one characteristic that parties desire in their brand is a reputation for fiscal responsibility, giving party leaders an incentive to internalize the costs of distributive projects.[2]

A problem with this argument is that it does not appear to fit all of the facts. Ashworth and Bueno de Mesquita point out that "the last several decades have seen an *increase* in party cohesion in Congressional voting... and party organizations have become *more*

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[1]See, e.g., Wilson (1885); Schattschneider (1942); American Political Science Association (1950); Ranney (1962); Fiorina (1980). Fiorina makes the case clearly: "The only way collective responsibility has ever existed, and can exist given our institutions, is through the agency of the political party; in American politics, responsibility requires cohesive parties" (1980, 26).

[2]Leadership might also come from the executive branch, at least in presidential systems (e.g., Chari, Jones, and Marimon 1997; Fitts and Inman 1992; Inman and Fitts 1990; Jones, Sanguinetti, and Tommasi 2000; Persson and Tabellini 1999). Elected executives internalize most costs because their constituency is, approximately, the entire population.

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assertive in policymaking. . . . In light of the party-based models, it is surprising, then, that House members actually do *more* constituency service today than they did 40 years ago" (2006, 169). A similar pattern holds for earmarks in recent years: a report by the Congressional Research Service shows that earmarks increased sharply between 1994 and 2005 in most appropriations bills and did not fall even as a fraction of total spending (http://www.fas.org/sgp/crs/misc/m012606.pdf); during this same time party cohesion in congressional roll-call voting continued to rise.

In this article we offer an explanation that focuses on parties but emphasizes their behavior in *elections* rather than inside the legislature. Mayhew (1986) characterizes strong electoral party organizations as autonomous, enduring, and hierarchical, that actively seek to nominate and elect candidates for a wide range of public offices, and that rely on material incentives to accomplish organization work. He calls these "traditional party organizations" (TPOs). Thought of in this way, party organizations have become *weaker* over time, especially at the state and local level.

When parties have strong electoral organizations, legislators have less incentive to engage in "credit-claiming" activities, such as constituency service and particularistic spending, because the party organization will do much of the work in helping them run for office. Since they can rely on the party organization, the marginal benefit of credit claiming is smaller.[3] Strong party organizations in the electoral process may therefore be as important as party organizations inside the legislature as a mechanism for constraining inefficient distributive spending. We use a variant on a Baron and Ferejohn (1989) bargaining model, as well as the framework of Weingast, Shepsle, and Johnsen (1981), to make this argument precise.[4] To our knowledge, there is no model that simultaneously examines how the nature of elections shapes the preferences of legislators, and in turn, shapes the composition and *size* of spending.[5]

The logic that drives our model is simple and follows from basic microeconomic principles which we will use in a political science context, focusing on a single legislator. Suppose that a legislator must decide how much to allocate to distributive benefits, such as new buildings, for his district, and public goods, such as the state National Guard, benefitting a larger geographic area.[6] The legislator picks a size of each, depending on the relative benefits he receives from these spending areas. Now, suppose that the value to the legislator of each dollar of distributive spending declines. Perhaps, for instance, the electoral benefits of distributive spending decline. How does the legislator's choice change? First, he wants less distributive spending since it is less valuable. Second, he will desire more public goods, because less distributive spending means that taxes to fund the public good can be raised with less hassle (or, using a term from economics, lower deadweight costs). Third, total spending will decline, since the legislator, on net, values government projects less than he did before (recall that distributive spending is less valuable and public goods are equally valuable).

This basic intuition drives three important results linking party strength and demand for government spending. First, distributive politics spending is declining in party organizational strength. Second, public goods spending is increasing in party organizational strength. Third, overall spending is declining in party organizational strength. As we will show, the relationships in the example above hold for legislatures operating under any q-rule, including the case of unanimous (universal) coalitions, thereby offering an explanation for how strong parties in the electorate can lead to lower spending even in a universalistic world. The results obtain in both a bargaining setting as well as a setting without collective choice. This model is strengthened even further if we assume that party reputation is improved by more efficient spending

[3] See Mayhew (1974) for the classic work on credit claiming in the U.S. Congress.

[4] For related models, see Volden and Wiseman (2007), Battaglini and Coate (2008), and Leblanc, Snyder, and Tripathi (2000). We focus on different comparative statics. For instance, Volden and Wiseman (2007) also study a model in which legislators bargain both over public goods and distributive (private) goods. They do not make the link between preference for public goods and political parties, but focus on different institutional design issues, such as closed versus open rules. Their model differs from ours because of our different purposes. In their model, the budget is fixed and benefits in both public and private goods are linear, so Wiseman and Volden can only address the relative amounts of the two types of goods provided in equilibrium. Also, they focus on the somewhat paradoxical result that, in some ranges of the parameter space, when legislators care a lot about public goods the equilibrium allocation may shift away from public goods and towards private goods, at least in relative terms. This happens because "policy proposers can exploit coalition partners' strong preferences for public goods to actually provide fewer public goods in equilibrium while directing more private goods to themselves" (Volden and Wiseman 2007, 79).

[5] Grossman and Helpman (2008) model the relationship between "party discipline," defined as being able to precommit to a platform, and total distributive spending. They find a nonmonotonic relationship in the model, but they do not consider the trade-off between public goods and distributive spending.

[6] We use the terms *distributive goods* and *public goods* in this article, but readers can substitute *particularistic* and *collective* for distributive and public, respectively.

or that strong parties in the electorate are tied to strong parties in the legislature.[7]

To explore whether party strength is tied to lower total spending empirically, we focus on spending in the U.S. states. Our starting point is Mayhew (1986), who provides evidence that well-organized parties constrain spending. In particular, he finds a strong, negative relationship between state government spending (as a fraction of total state income) and the existence of traditional party organizations across states. We examine state spending and federal aid data for fiscal years 1957–2000 and establish that the negative relationship between party strength and government spending even holds within states over time. When party strength increases, spending in a state declines by 4 to 9%. We also find evidence that states with strong parties receive less federal aid than states with weak parties, though this result is not as robust as our finding for state spending. We theorize that this relationship holds because members of Congress receive a smaller return on aid when the party organizations in their state are strong, because they need fewer electoral resources.

Theory

Motivation

Conceptually, we can distinguish between electoral environments where the "personal vote" is important and those where party labels dominate. As Cain, Ferejohn, and Fiorina write, "A representative highly sensitive to local concerns can be locally responsible and nationally irresponsible. Pork barrel projects are the classic example. . . . [T]he parochial pressures institutionalized in single-member districts must be offset or overridden by some formal or informal mechanisms. Examples of formal mechanisms include cabinet governments and restrictions on private member bills. An example of an informal mechanism is a strong party system" (1987, 209–10).

Nielson puts the intuition this way: "The personal vote, where politicians pursue votes based on their individual popularity that they heighten through promises of pork and patronage, makes politicians beholden to narrow constituencies and relatively indifferent to national policy goals. The personal vote thus undermines public-goods production. On the other hand, votes aggregated at the level of the party have a greater chance of motivating politicians to pursue nationally oriented public-goods policies. Party leaders, charged with attending to the collective electoral prospects of their rank-and-file members, have a much greater stake in national policy outcomes, including the provision of public goods. In party-centered systems they can discipline back-benchers in a joint pursuit of collective welfare" (2002, 11).

To formalize this intuition, let $\alpha \geq 1$ denote a legislator's relative preference for distributive versus public goods; a higher value of α indicates that the legislator weights distributive goods more heavily in his or her utility function. The value of α is determined by several different factors, one of which is the degree to which politics is personalistic rather than party oriented. To the extent that political parties have weak organizations, and campaigning and elections are candidate centered, α will be higher. Candidates who cannot rely on parties will value distributive spending more highly because it provides a way to secure the personal vote directly (e.g., Ames 2001) or indirectly via increased campaign contributions (e.g., Samuels 2002). Under these circumstances legislators put more weight on distributive spending that flows to their districts. If political parties have strong organizations and are important sources of campaign resources for candidates, legislators will put less weight on distributive spending, leading to lower values of α.[8]

The mechanism by which strong parties alter α can be understood by considering an electoral production function f which translates distributive goods (z_i), support from the party benefitting all candidates (r), candidate-specific support from the party (r_i), and other inputs such as candidates' campaign spending and policy positions into an election outcome. Assuming that $\frac{\partial f}{\partial z_i \partial r} < 0$ and $\frac{\partial f}{\partial z_i \partial r_i} < 0$, then a decline in party support will increase the value of distributive goods that can be used for credit claiming—i.e., increase α. (Support here need not be financial; it also includes the value of the party "brand," voter mobilization, and other activities of the parties that benefit a candidate.) Of course, the strength of an *opponent's* political party may cause a legislator to demand more distributive spending to fend off a challenger with strong party support. However, this effect is unlikely to be very large, since legislators are unlikely to be able to alter

[7] Typically strong parties in the electorate will be linked to strong parties in the legislature, but there are exceptions. For instance, in the 1950s and 1960s, many strong party organizations were local and were in competition with one another. Such a situation would hardly create powerful parties within the legislature. In fact, this competition may have hindered the development of strong parties in the legislature. We address such a possibility—weak parties in the legislature and strong parties in the electorate—in the empirical portion of the article.

[8] When α is low, legislators might also put more weight on the "public goods" component of their party's platform. This might be the case especially in countries or electoral systems in which strong parties try to create spending programs that benefit large sectors of the country. We do not model this here. Adding it would just reinforce our conclusions.

levels of distributive spending very quickly in the presence of a strong challenger. Moreover, the incumbent's party is likely to devote considerable resources to close races, and a party can more easily reallocate resources than a legislator can redirect distributive spending. What about intraparty competition? Competitive primary elections reinforce our theory. If party organizations are strong, then one thing they can do is prevent primary challengers from emerging. If parties are weak, then incumbents will need to rely more on distributive spending to fend off primary challengers. Our analysis, therefore, applies to situations where one party dominates the landscape but lacks strong party organizations, leading to frequent primary competition—as in the South during much of the twentieth century.

The idea that redistribution and/or distributive spending are traded off against other electoral resources is well established in the theoretical literature on elections. For instance, a series of models studying the targeting of redistribution to swing voters or partisan voters emphasizes the trade-off between distributive spending and policy in influencing voters (e.g., Cox and McCubbins 1986; Dixit and Londregan 1995; Lindbeck and Weibull 1987). Others, like McGillivray (2004) and Golden and Picci (2008), argue that the strength of parties will influence whether close seats or safe seats are targeted for redistribution in single-member districts, with strong parties targeting redistribution to marginal seats; we do not model this here.[9] Of course, many other factors go into the determination of α.[10] We are interested in how changes in party strength influence α and, in turn, equilibrium behavior. All that we require for α and party strength to be related is that distributive spending and party organization are both electoral resources and that distributive spending can serve as a substitute for the electoral benefits of a strong party organization. If distributive spending confers direct electoral benefits on legislators in the form of vote share, then as parties get weaker and party support declines, the benefits from distributive spending will be more valuable to legislators, all else equal.[11] As a result, the value of a given dollar of distributive spending, relative to public goods spending, increases. This is captured by a higher α. Whether this effect is large or small is an empirical matter.

[9]There is limited empirical evidence for this claim; see footnote 22.

[10]For instance, see Ashworth and Bueno de Mesquita (2006) for an argument that increased partisan balance in the electorate leads legislators to provide more constituency service.

[11]This is certainly a reasonable assumption. Levitt and Snyder (1997), Stein and Bickers (1994), Alvarez and Saving (1997), and others have shown that federal spending and projects benefit incumbents.

Actors and Preferences

Let N be the total number of citizens in a state or country who are partitioned into n odd and equally sized districts, with $m = N/n$ denoting the number of citizens in each district. There are two types of goods—a pure public good that benefits all districts, and a distributive good that benefits a single district. Let X be the total amount spent on the public good. The public good provides a benefit of $b(X)$ to each citizen, where $b' > 0$ and $b" < 0$. Let z_i be the per capita amount spent on distributive goods in district i; this spending only benefits the citizens of district i. Let $\mathbf{z} = (z_1, \ldots, z_n)$ be the vector of per capita distributive spending, and let $Z = (N/n)\sum_{i=1}^{n} z_i$ be the total amount spent on distributive goods. Then the total cost of public spending is $c(X + Z)$, where $c(0) = 0$, $c' > 1$, and $c'' > 0$, accounting for the deadweight costs of taxation. We also assume that $c'(0) < Nb'(0)$ (otherwise, spending on the public good is always undesirable) and that deadweight costs are not so great that citizens and legislators prefer no distributive spending even when costs are shared across districts. Assume that all costs are divided equally among citizens. Begin with the assumption that legislators maximize the payoffs of citizens in the district; we relax this assumption below when we incorporate party strength into the model.

The total payoff to the citizens in district i is

$$U_i(X, \mathbf{z}) = \frac{1}{n}\left[Nz_i + Nb(X) - c(X + Z)\right]. \quad (1)$$

The total payoff for citizens in all districts is

$$U(X, \mathbf{z}) = \sum_{i=1}^{n} U_i(X, \mathbf{z}) = Z + Nb(X) - c(X + Z). \quad (2)$$

This model is set up so that only public goods are produced at the social optimum, defined here as the $(X, \mathbf{z})$ that maximizes (2).[12] Intuitively, the presence of distributive goods increases the costs of providing public goods, leading to underprovision of the latter. Since taxation entails deadweight costs, the costs of providing distributive goods in this model always exceed the benefits.

[12]In distributive politics models where costs are shared by all districts, many allocations are Pareto optimal if lump-sum transfers are ruled out. To see this, consider three districts. Two of the districts receive no distributive spending. A third receives a distributive project that costs the district five dollars, all other districts five dollars, and gives the district receiving the project a benefit of seven. If lump-sum transfers are not permitted, then this allocation is Pareto optimal. However, all districts could be made better off if the project were eliminated (or reduced in scope) and the district losing the project were compensated. To ensure that Pareto optimality and social welfare maximization coincide, we assume that such lump-sum transfers are possible. See Milgrom and Roberts (1992) for more details.

Although distributive goods are not provided at a social optimum, legislators and voters prefer a positive level of distributive spending because the costs of distributive goods are spread out across all districts.[13] Cost-sharing makes distributive spending relatively more attractive. Because some positive level of distributive spending is optimal for each district and deadweight costs of taxation are present, the cost of providing the public good will increase, leading the legislator to prefer a smaller-than-socially-optimal public good. These relationships are summarized as follows:[14]

Remark 1. The socially optimal division of spending is for all funds to be allocated to the public good and none to distributive projects.

Remark 2. Legislators prefer public goods that are smaller than socially optimal and distributive projects for their district that are larger than socially optimal.

Capturing Party Strength

Now, let $\mathbf{z}_{-i}$ denote the vector of per capita distributive spending in all districts other than district i, and let $Z_{-i} = (N/n)\sum_{j\neq i} z_j$ be total distributive spending in all districts other than i. The payoff to legislator i is

$$V_i(X, z_i; Z_{-i}) = \frac{1}{n}\left[\alpha N z_i + N b(X) - c(X + Z)\right] \quad (3)$$

This is similar to (1) above, but with the weight α placed on distributive spending.[15]

As a thought experiment, suppose that each legislator could unilaterally select the project for his or her district. Now consider the action of one legislator who does the same and also selects the size of the public good. This "universalistic" setup is similar to that in Weingast, Shepsle, and Johnsen (1981), except with the addition of a public good and a weight on distributive spending. As legislators weight distributive projects more heavily, they will naturally demand more of them and, in turn, demand less of the public good. The net effect is to increase total spending because, overall, the benefit of the combined public and distributive good has increased, while the costs of taxation have remain unchanged. Conversely, as distributive goods are de-emphasized, spending will decline, for the same reasons. This result establishes an alternative explanation for why strong parties may dampen the tendency toward overspending implied by a norm of universalism.

Remark 3. Under a norm of universalism, as party organizations in the electorate become stronger, legislators collectively will select smaller amounts of distributive projects for their districts and larger public goods benefiting all districts. The net effect of these changes is to reduce total spending.

A Legislative Bargaining Setting

It is straightforward to show that the same type of result holds in a bargaining setting. A legislature L must select a vector consisting of a public good X and a vector of distributive projects $\mathbf{z}$, defined above. The game is an infinite-horizon bargaining model with the following structure, similar to that in Baron and Ferejohn (1989). The legislature operates under a q-rule, $\frac{n+1}{2} \leq q \leq n$. A randomly chosen agenda setter proposes a public good and distributive projects as part of an omnibus bill. Bargaining proceeds under a closed rule, which means that no amendments are allowed. If the bill passes, the game ends. If it fails, a new agenda setter is chosen to make a new proposal. The game continues until a bill passes, with $0 < \delta \leq 1$ accounting for delay in bargaining. Let v be the continuation value of the game for a legislator offered a project by the agenda setter.

The equilibrium concept is subgame perfect Nash in stationary strategies, where players must take the same actions at every node in which the game is structurally identical. This means that in every period, the same equilibrium offers will be made.

We are interested in answering three questions: (1) What are the effects of changes in party strength on public goods spending? (2) What are the effects of changes in party strength on distributive spending? (3) What are the effects of changes in party strength on total spending?

Proposition 1. *In the stationary subgame perfect Nash equilibrium of the game, total spending is decreasing in party organizational strength in the electorate, spending on public goods is increasing in party organizational strength,*

[13] The relative levels of public goods and distributive spending in the model will depend on the shape of the benefit functions. Some districts, for instance, may prefer public goods spending relative to distributive spending, and legislators will respond accordingly. To keep the model tractable, we treat all districts the same, but allowing preferences to vary across districts in this way is an interesting extension to consider.

[14] All remarks and the proposition are proven in the proofs section at the end of the article.

[15] Since $c' > 1$, if $\alpha < 1$ then the agenda setter's optimal choice of Z is sometimes zero in the bargaining model. If $\alpha < 1/n$, then legislator i's preferred project size may sometimes be zero. Note, $\alpha = 1$ does not mean that the legislator treats public and distributive goods the same. This will depend on the relative benefits implied by the utility functions for X and for z_i. We can achieve the appropriate weight between distributive and public goods when parties are at their weakest by adjusting the utility functions accordingly.

and spending on distributive goods is declining in party organizational strength.

The motivation for this proposition is as follows. As party strength in the electorate increases, legislators will demand less of the distributive good at any price.[16] This has a downward effect on distributive spending. Because of the deadweight costs of taxation, this makes the public good relatively less expensive, leading legislators to demand more of the good. The net effect is to reduce spending because the impact of a change in party strength has a large, direct impact on demand for distributive projects by changing their benefits, while it has a smaller, indirect effect on public goods spending by reducing the deadweight costs of taxation. The agenda setter, in constructing proposals, wishes to secure a larger public good and less distributive spending, since he is able to build a coalition more cheaply in this way once the value of distributive spending declines. Absent any conception of party strength, the public good is inefficiently small in the equilibrium, while the distributive good is inefficiently large. Party strength moves both the size of the public good and the size of distributive spending in a more efficient direction. Two additional results are worth noting.

Remark 4. As the size of the majority required for bill passage increases, spending on distributive goods decreases, spending on public goods increases, and total spending decreases.

Intuitively, as the coalition required for bill passage increases, more of the costs are internalized by the agenda setter, who has to take into account the welfare of coalition members in constructing optimal proposals. In fact, unanimity rule achieves the optimal outcome when legislators are perfectly patient. The reason is that under unanimity rule the agenda setter fully internalizes the welfare of all legislators and is therefore acting as if he or she is the social planner. Of course, the advantages of unanimity rule for efficiency may be counteracted by other considerations, such as holdup costs in bargaining, especially with imperfect information about preferences.

[16]Of course, if proposing projects was costless, legislators would demand as much distributive spending as possible. Given the setup of our model, the costs borne by the district for projects prevent infinite demand for distributive spending. Admittedly, legislators rarely refuse a request to submit a list of projects to be funded in their districts. But, even these lists are constrained by cost considerations, and our model implies that stronger parties should constrain requests even further.

Remark 5. Changing the number of districts has no effect on total spending on distributive goods, spending on public goods, or total spending, as long as the proportion of votes required to pass a proposal (q/n) is unchanged.

This follows directly from the first order conditions of the proposer's maximization problem. Increasing the number of districts *would* have effects if the majority threshold (q) was held fixed, but it seems more reasonable to think of q/n as fixed.[17]

In sum, whether examining individual legislator preferences, adopting a decision-theoretic approach, or using a bargaining model, party strength limits distributive spending, increases spending on worthwhile public goods projects, and reduces spending overall. We now turn to U.S. state spending and federal aid data to examine the impact of party strength empirically.

Application: Party Strength in the U.S. States

We focus on one of the comparative statics from the second section, studying the impact of party strength on the total size of state government spending and federal aid to the states.[18] The analysis proceeds in two ways. One emphasizes cross-sectional variation in party strength across states. The other takes advantage of over-time variation in strength within states, using panel analysis and, as a first cut, differences-in-differences (DD) estimation.[19] The cross-sectional analysis focuses on the time period 1957–1970, and the analysis leveraging over-time

[17]Note also that tiny changes in q/n may automatically occur when n changes due to the fact that q and n are treated as integers in our model.

[18]We do not attempt to separate distributive and public goods spending because, in practice, doing so either requires heroic assumptions or is infeasible, given how spending data are categorized. For instance, should highway spending be classified as distributive spending (the road might not need to be built and might only benefit a tiny area) or as a public good (the road benefits all in the state by virtue of better connecting localities in the state)?

[19]The DD analysis compares how outcomes are influenced by an institutional change that affects only a portion of a sample; in our case, the DD analysis compares the change in spending in states that had strong parties which became weak due to a "shock" in the 1970s with states that had weak parties even before the 1970s "shock." We refer to the analysis where "before" and "after" data are collapsed as DD to distinguish this analysis from the panel analysis with year and state fixed effects. Technically, though, both are a form of DD. See Bertrand, Duflo, and Mullainathan (2004) for additional background.

variation utilizes the time period 1957–2000.[20] Our specifications rely on ordinary least squares with year and state fixed effects employed, as appropriate. To address heteroskedasticity and autocorrelation in the data, we use clustered standard errors with clustering by state in all but the DD analysis (Bertrand, Duflo, and Mullainathan 2004).[21]

To the extent that parties are well organized, they are better positioned to provide the sorts of electoral resources that substitute for distributive projects. At the state level, this should lead to lower government spending. At the federal level, this should lead to lower levels of aid because the members of Congress from that state can rely more on party support.[22]

There are many ways to measure party organizational strength. Our conception of party strength is not related to the parties' relative positions in the legislature, so straightforward measures such as seat shares will not be used except as controls. We wish to focus, instead, on measures that are related to "parties in the electorate" and "parties as organizations" rather than "parties in government" (Key 1964). We measure the capacity of parties as electoral organizations using an analysis of the historical record.

Party organizational strength within the legislature may be correlated with party organizational strength outside of the legislature. To the extent that this is the case, our measure of party electoral strength may also be tapping party legislative strength. We deal with this in two ways. First, we include measures of strong party organizations in legislatures as a control variable in some specifications, showing that the inclusion of such variables does not change the impact of party electoral strength. Second, we show that states with strong parties in the electorate tend to receive lower levels of federal aid, suggesting that members of Congress do not seek out as much aid for their states since doing so is not as important electorally if parties provide resources. By focusing on decisions made within Congress, we are able to hold party strength in the legislature constant with year fixed effects.[23] Combined, these checks support the claim that the measure of party electoral strength is tapping the impact of electoral, and not internal legislative, party strength.

[20] The U.S. Census Bureau began estimating state and local spending annually in 1957.

[21] This correction is appropriate when there is uncertainty about the precise nature of the autocorrelation process (Bertrand, Duflo, and Mullainathan 2004). A standard assumption about autocorrelation is that it follows an AR(1) process. As a robustness check, this assumption is used as part of a GLS estimation with panel-corrected-standard errors (Beck and Katz 1995) and year dummy variables. The results are similar when this approach is used.

[22] Other factors could produce a correlation between federal spending and party strength. For example, strong party organizations might be associated with higher levels of interparty electoral competition, and federal spending might be targeted towards such "swing" states. Empirically, however, while some scholars have found evidence that federal spending is targeted to vulnerable members of Congress (e.g., Stein and Bickers 1994), others have found little evidence that federal spending is strongly targeted at swing states (e.g., Larcinese, Snyder, and Testa 2006).

Measure of Party Strength

The variable *Party Organization* is based on the comprehensive study by Mayhew mentioned in the introduction. As Mayhew writes, "[L]ocal party organizations of several kinds have decisively declined since the 1960s in their ability to influence nominating processes for local, state, or national office, bringing to an end practices in some cases a century or more old. The 1950s and 1960s were a golden age of sorts for American local organization. . . . All [party organizations] fared very badly in the 1970s, largely losing out to candidate organizations that introduced capital-intensive campaigns" (1986, 329–30). Mayhew classified 13 states as having very strong party organizations during the 1950s and 1960s based on his reading of the historical literature, taking into account elements of party organizations such as their autonomy, internal structure, role in candidate nominations, and reliance on material rather than purposive incentives. While the scores are therefore somewhat subjective, they represent a massive amount of work and the synthesis of a vast literature.

We define *Party Organization* = 1 for states with TPO scores of 4 or 5 (CT, DE, IL, IN, KY, MD, MO, NJ, NY, OH, PA, RI, WV), and *Party Organization* = 0 otherwise. In the analysis for 1957–2000, we set *Party Organization* = 0 for all years after 1970, in keeping with Mayhew's observation that electoral party organizations in the states essentially collapsed post-1970. In the next section, we present evidence justifying this approach. Endogeneity of party strength is not a concern here because the decline of parties is largely orthogonal to fiscal decision making.

Dependent Variables

The unit of analysis is the state. We use data for 46 states. Alaska and Hawaii were not yet states for some of the years in the dataset, Nebraska has a nonpartisan unicameral

[23] Federal aid may be endogenous to state spending, though most public finance studies treat it as exogenous; adding it or leaving it out of the spending analysis does not alter our findings in significant ways.

legislature, and Minnesota had a nonpartisan legislature for a large fraction of the time period under study.

In the analysis of federal aid, the dependent variable is the log of total real federal aid per capita in 1970 dollars, adjusted using consumer price index (CPI) deflators (*Ln Fed Aid Per Capita (State+Local)*). In the state spending analysis, the dependent variable is the log of total real state plus local general expenditures per capita in 1970 dollars, adjusted using CPI deflators (*Ln State Spending Per Capita (State + Local)*). As a robustness check, we also use state-level-only spending in our analysis (*Ln State Spending Per Capita (State-Only)*). We have also run this analysis using levels of instead of logs of financial variables; we indicate in the results section whenever the results are affected by using alternative measures.

Other Independent Variables

We also include standard control variables in the analysis. These include income (*Ln Income Per Capita*), population (*Ln Population*), population density (*Ln Density*), percent elderly (*Elderly*), percent school age (*Schoolage*), the share of state legislative seats held by Democrats (*Dem Leg Seat Share*),[24] the average Democratic vote share in the state over the past 10 years (*Avg Dem Vote Share*), presence of divided government (*Divided Govt*), a dummy for southern states (*South*), the number of seats in each state legislative chamber divided by 100 (*Upper House Seats* and *Lower House Seats*) (Gilligan and Matsusaka 1995, 2001), and a dummy indicating whether a state has the direct initiative (*Initiative*) (Matsusaka 1995).[25] In the specifications with state spending as a dependent variable, federal aid (*Ln Fed Aid Per Capita (State + Local)*) is also included as a control. We omit this variable from some specifications as a robustness check.

In some specifications we also include a measure of party organizational strength within the legislature for the 1950s and 1960s (*Legislative Party Strength*). During part of this time period, Zeller (1954) conducted a survey of experts in state politics and constructed a measure of party cohesion in the legislature. We use this measure for the time period 1957–1970, coding it 1 if Zeller identified the state as having strong parties, and 0 otherwise. (We lack a reliable measure of legislative party strength after 1970, so we only use the Zeller measure in the pre-1970 period.) Seventeen states have strong parties in the legislature. Of the 46 states in our sample, 10 states are categorized differently by Mayhew and Zeller.

State spending, population, and income data are from the U.S. Bureau of the Census, Government Finances, and State Government Finances databases. Other demographic variables are taken from the decennial census and imputed for years between censuses. Data on the distribution of legislative seats, chamber sizes, and convention rules are from Burnham (1985) and *The Book of the States* (various years). Data on citizen initiatives are from the Initiative and Referendum Institute. The election data used in the analysis are taken from a large number of sources—secretary of state reports, state manuals and blue books, and in some cases newspapers (see Ansolabehere and Snyder 2002 for details).

Evidence on the Decline of Party Organizational Strength

Mayhew (1986) argues that most, if not all, strong party organizations declined sharply by the mid-1970s. There is other evidence consistent with Mayhew's claim. First, split-ticket voting increased markedly during the 1960s and 1970s, and on into the 1980s. Even more interestingly, split-ticket voting increased noticeably more in the states that had strong party organizations compared to other states. An examination of aggregate electoral data and the American National Election Studies (ANES) confirms this.

For the ANES analysis, we examined respondents' vote choices for president, governor, U.S. senator, and U.S. House representative. We define a "split ticket" as a case where a respondent reported voting for a Democrat for at least one of these offices and Republican for at least one of these offices in the same year. The variable is zero for all respondents who reported voting for at least two of these offices (and therefore could have split their ticket) and either reported voting only for Democrats or only for Republicans.

For the aggregate voting analysis, we use state-level data on all statewide offices up and down the ballot—president, governor, U.S. senator, as well as down-ballot offices such as lieutenant governor, attorney general, state treasurer, secretary of state, and state auditor. We define the average level of "ticket splitting" as the standard

[24] To examine whether the impact of party strength varies by party composition in the legislature, we interacted the Democratic seat share with the party strength variable in the spending analysis; this interaction had no effect.

[25] When including state fixed effects, we drop *Initiative*, since it is nearly invariant over time; *Ln Population*, because it is perfectly collinear with state fixed effects and the log of population density; and the dummy for southern states, *South*.

TABLE 1 Split-Ticket Voting

	ANES			Aggregate Votes		
	Strong Parties Pre-1970	Weak Parties Pre-1970	t-stat.	Strong Parties Pre-1970	Weak Parties Pre-1970	t-stat.
Pre-1970	.20	.26	(6.11)	.029	.052	(5.69)
Post-1970	.34	.31	(4.26)	.073	.080	(1.59)
Change Across Periods	.14	.05		.044	.028	
	(13.67)	(5.23)		(9.58)	(8.97)	

Within each time period, the absolute value of the t-statistic is for a test of the difference in means between states with strong parties and states with weak parties.
Within each group, the absolute value of the t-statistic is for a test of the difference in means before and after 1970 for each category of states.
For the ANES analysis: pre-1970 period is 1952–1970 and post-1970 period is 1972–2000.
For the aggregate analysis: pre-1970 period is 1950–1970 and post-1970 period is 1971–2000.

deviation of Democratic vote share across all available offices in a given state in a given year.[26]

The results are shown in Table 1. Regardless of the measure used, the estimated amount of split-ticket voting is higher in the post-1970 period than in the pre-1970 period. But the growth in split-ticket voting is much more impressive in the states defined as having strong party organizations pre-1970. In these states the fraction of split tickets rose from 20% to 34%, and the standard deviation measure grew from .029 to .073. In the states defined as having weak parties in both periods, the growth was more modest: a split-ticketing increase from 26% to 31%, and a standard deviation increase from .052 to .080. Also, in the pre-1970 period the gap in split-ticket voting was quite large and in the expected direction, with significantly lower levels of split-ticket voting observed in states with strong party organizations. For the standard deviation measure, the average gap between the groups closed in the second period, leaving a small and statistically insignificant difference. For the ANES measure the difference reversed, and the (formerly) strong party states appear to have slightly higher levels of split-ticket voting in the second period; this difference, though, is dwarfed by the over-time differences.[27]

[26]We first drop all races where a third-party candidate received more than 10% of the vote, and then only use state-years with three or more "clean" two-party races.

[27]This unexpected finding could be an indication that parties in formerly strong party states ended up even weaker than formerly weak states after 1970. To probe this possibility, we examined surveys of party strength that were done in the 1970s and 1990s, and we found no evidence that formerly strong party states were weaker post-1970 than formerly weak party states.

TABLE 2 Federal Aid to the U.S. States, 1957–1970

Dep Var = Ln Federal Aid Per Capita (State + Local)				
	(1)	(2)	(3)	(4)
Party Organization	−.37*** (.11)	−.17** (.088)	−.0013 (.084)	.027 (.081)
Ln Income Per Capita	−.09 (.25)	.26 (.37)	.33 (.28)	.36 (.28)
Ln Density	–	–	−.17*** (.045)	−.15*** (.045)
Legislative Party Strength	–	–	–	−.11* (.060)
Other Controls	No	Yes	Yes	Yes
R-squared	.58	.77	.82	.83

OLS regression with standard errors clustered by state and year dummies included in all specifications. N = 644. *p < .10; **p < .05; ***p < .01.

Cross-Sectional Results, 1957–1970

Federal Aid Analysis

Table 2 presents the results of the federal aid analysis. We present several specifications. The first includes only year fixed effects and income. The second adds additional controls. The third adds population density. The final specification adds the Zeller measure. Table 6 presents the results of a specification with all control variables included.

For the period 1957–1970, the estimated coefficient on *Party Organization* is substantively and statistically

TABLE 3 Spending in the U.S. States, 1957–1970

Dep Var = Ln State Spending Per Capita (State + Local)					
	(1)	(2)	(3)	(4)	(5)
Party Organization	−.18***	−.08***	−.07***	−.08***	−.07***
	(.037)	(.036)	(.021)	(.023)	(.024)
Ln Income Per Capita	.83***	.93***	.84***	.83***	.84***
	(.10)	(.13)	(.10)	(.10)	(.10)
Ln Density	–	−.044***	–	.0058	.0069
		(.016)		(.011)	(.011)
Ln Federal Aid Per Capita (State + Local)	–	–	.29***	.30***	.30***
			(.031)	(.033)	(.034)
Legislative Party Strength	–	–	–	–	−.013
					(.024)
Other Controls	No	Yes	Yes	Yes	Yes
R-squared	.78	.88	.93	.93	.93

OLS regression with standard errors clustered by state and year dummies included in all specifications. N = 644. *p < .10; **p < .05; ***p < .01.

significant in the simplest specifications (columns 1 and 2 of Table 2). The coefficient becomes statistically and substantively insignificant, however, once population density is added to the specification. Strong party organizations and machines emerged especially in urban areas in the northeastern United States, and these areas were not as powerful politically in Washington as were rural (mostly Southern) areas for much of this time, when committee-centered politics was the norm (e.g., Rohde 1991; Shepsle 1989). For instance, in 1964 a disproportionate share (71%) of major committee chairs were from rural areas (Wolfinger and Heifetz 1965), and there is strong evidence that their influence directed significant federal funds, especially agriculture spending, to rural areas (McCubbins and Schwartz 1988). Another reason states with dense urban areas tend to receive less aid on a per capita basis may be related to costs. It is often cheaper to provide the same level of goods and services in urban areas than in areas with widely dispersed groups of individuals. Therefore, the same task can often be accomplished with less funding. In sum, it is difficult to disentangle the effects of party organization and population density without variation within states. We explore this further in the next section along with additional interpretations.

The coefficient on *Legislative Party Strength* is marginally statistically significant, even with population density included.[28] The point estimate implies that states with strong parties in the legislature received about 11% less aid than states without strong parties in the legislature.[29] One reason for this effect might be that legislators in these states were spending less at the state level and therefore were not eligible for as much federal aid, since much federal aid is explicitly or implicitly in the form of matching grants.

State Spending Analysis

The results presented in Table 3 show that TPO has a statistically and substantively significant effect on spending. Spending is about 7% lower in states with strong party organizations during this time period. The full specification appears in Table 6.

The result is robust in the pre-1970 period to the inclusion of the Zeller measure of legislative party strength, suggesting that TPO is tapping electoral party organization. In fact, *Legislative Party Strength* is not statistically significant in the spending analysis, whether *Party Organization* is in the specification or not. While parties in legislatures may very well act as a restraint on spending, our results show that what happens outside of the legislature is also important. These results strengthen the

[28] If *Party Organization* is dropped from the specification, then the coefficient on *Legislative Party Strength* is largely unchanged but is no longer statistically significant (p-value = .103).

[29] A change in a dummy variable from 0 to 1, in a regression with a logged dependent variable, can be interpreted as producing a $100(e^{\beta_d} - 1)$ percent change in the untransformed dependent variable, where β_d is the coefficient on the dummy variable.

TABLE 4 Federal Aid to the U.S. States, 1957–2000

Dep Var = Ln Federal Aid Per Capita (State + Local)				
	(1)	(2)	(3)	(4)
Party	−.36***	−.26***	−.22***	−.22***
Organization	(.09)	(.080)	(.076)	(.079)
Ln Income	−.14	.12	.24	.20
Per Capita	(.14)	(.21)	(.24)	(.19)
Ln Density	–	–	−.047	−.57***
			(.031)	(.14)
Other Controls	No	Yes	Yes	Yes
State Fixed Effects	No	No	No	Yes
R-squared	.79	.86	.86	.94

OLS regression with standard errors clustered by state and year dummies included in all specifications. N = 2,024. *p < .10; **p < .05; ***p < .01.

extant empirical work linking parties and government spending.

Panel Results, 1957–2000

We now consider the longer period, over which party organizations across the country have declined in strength. As a first cut, we collapse the data and conduct a simple differences-in-differences (DD) analysis. With a complete set of controls included, the estimates imply that states which moved from strong parties to weak parties in the 1970s experienced an 18% larger increase in federal aid than states that had weak parties in both time periods. Similarly, states which moved from strong parties to weak parties in the 1970s experienced a 4% larger increase in spending than those that had weak parties in both time periods.

The results of a full panel analysis are similar to the differences-in-differences findings. Table 4 shows that party organization has a negative and statistically significant effect on aid to the states. States with strong parties in the electorate receive about 20% less aid than states with weak parties. This result is similar to the 1957–1970 analysis when density is not included as an independent variable. The result is robust to state fixed effects—which when combined with year fixed effects is another form of DD—as the final column in Table 4 indicates. Table 6 provides the results for all variables.[30]

Table 5 shows that states with strong party organizations spend at least 4% less than those states with weak party organizations.[31] This negative relationship is robust to state fixed effects, as column (5) of the table shows. (Full results are available in Table 6.) When we omit the federal aid variable in the full analysis with state fixed effects, the effect increases to 9%. Including the federal aid variable sharply reduces the estimated impact of party organizational strength in part because aid is itself affected negatively by party strength. Without federal aid in the analysis the party strength variable is doing "double duty," accounting for both the direct effect of party organization on spending as well as its indirect effect via changes in aid. Thus, the specification that includes federal aid is probably conservative, understating the total effect of party strength.

Mayhew Revisited

Mayhew (1986) was one of the first scholars to point out the possible link between spending and party strength, and probably the first to show how strong the relationship is empirically. It is important, therefore, to compare our argument and analysis with his.

Mayhew discussed five possible explanations for this relationship: (1) "in regimes infused by traditional organization the *inherent impulse* to generate ambitious governmental programs is likely to be relatively weak. This is true for two reasons: the sorts of people attracted to organization politics are relatively unlikely to have much of a program-building bent, given party incentive structures; and the particularism required for organizational maintenance may tend to crowd out other kinds of government activity"; (2) "*interest groups* of a program-building inclination (some unions, for example) seem to have a hard time exercising influence in a milieu of traditional organization"; (3) "the evident relative *issuelessness* of electoral politics in organization environments" leads to smaller government, while "an electoral politics built on raising and addressing issues may promote government action"; (4) "the patronage needs of traditional organization inhibit the installation of a professionalized *bureaucracy*, and thereby fend off the rationalizing and also expansionary impulses of bureaucracy that are likely to generate both expenditure and revenue in a governmental setting"; (5) traditional party organizations carry with

[30]These results are not robust to the use of levels instead of logs of financial variables. We have not found evidence that outliers are driving this difference in the results.

[31]As with the federal aid analysis, the results are more sensitive to the inclusion and exclusion of variables when we use levels of financial variables instead of logs.

TABLE 5 Spending in the U.S. States, 1957–2000

Dep Var = Ln State Spending Per Capita (State + Local)					
	(1)	(2)	(3)	(4)	(5)
Party Organization	−.17***	−.12***	−.045*	−.039	−.037**
	(.032)	(.028)	(.025)	(.026)	(.015)
Ln Income Per Capita	.74***	.78***	.68***	.70***	.45***
	(.094)	(.11)	(.066)	(.067)	(.079)
Ln Density	–	−.025*	–	−.0085	−.0063
		(.012)		(.0065)	(.030)
Ln Federal Aid Per Capita (State + Local)	–	–	.35***	.34***	.25***
			(.033)	(.032)	(.030)
Other Controls	No	Yes	Yes	Yes	Yes
State Fixed Effects	No	No	No	No	Yes
R-squared	.90	.93	.96	.96	.98

OLS regression with standard errors clustered by state and year dummies included in all specifications. N = 2,024. *p < .10; **p < .05; ***p < .01.

them "a distinctive American *tradition*. . . of politics as a spectator sport with a deep pessimism . . . about the potential positive use of government" (Mayhew 1986, 292–95).

Explanations (2) and (4) are related. Explanation (4) refers to the type of bureaucracy that is likely to emerge when strong parties engage in patronage hiring compared to one in which a professionalized bureaucracy emerges. Measures of employment and salaries are available for the time period under study, but determining whether large numbers of employees represent a professionalized bureaucracy or a patronage machine is not possible. However, the strength of a bureaucracy is closely tied to the interest group environment of a state. If interest groups are unsuccessful in securing the creation of large programs, which may occur in strong party states (Explanation 2), this will be reflected in part by a weak bureaucracy that is not centered around program creation and maintenance. The Zeller (1954) study referenced above includes a measure of interest group strength in a state. Of the 45 states with both measures of electoral party strength and interest group strength available, only one (KY) has both strong electoral parties and strong interest groups and nine are weak on both grounds. Therefore, there is a very strong negative connection between the strength of interest groups (and perhaps, by extension, the bureaucracy) and the strength of parties. This relationship is consistent with our argument.

Explanations (1), (3), and (5) all suggest that areas with strong electoral party organizations will tend to produce politicians who lack ambitious programs for using government to solve perceived social problems. That is, they should produce fiscally conservative politicians who typically prefer a small government that does not try to do much, not liberals with large, sweeping agendas. We can test this by examining the average ideology of legislators elected from states with strong versus weak party organizations. Within party, we should see a significant positive correlation between organizational strength scores and conservatism.

As a modest first step in this direction, we study states' representatives and senators in the U.S. Congress. We use Poole and Rosenthal's (2007) DW-NOMINATE scores to measure ideology. These are computed from roll-call voting records and are among the most widely used measures in the congressional literature. The range of scores is −1 to +1, with −1 being the most liberal score and +1 being the most conservative. Paralleling the analyses above, we estimate a simple cross-sectional specification for members elected from 1956 to 1970, as well as a DD specification over the entire period 1956–2000. We control for party in both specifications.

In the interest of space we summarize the results very briefly. In the cross-sectional analyses the estimated coefficients on *Party Organization* are −.014 for representatives and −.011 for senators—these are both statistically and substantively insignificant. In the DD analysis the estimated coefficient on *Party Organization* is −.015 for representatives and .009 for senators—again, these are statistically insignificant and substantively trivial. Thus, both the cross-sectional and DD results show no significant differences between states with strong party organizations and other states. This contradicts the main thrust of explanations (1), (3), and (5).

TABLE 6 Government Spending and Federal Aid in the U.S. States

Dep Var (a) = Ln Federal Aid Per Capita (State + Local) Dep Var (b) = Ln State Spending Per Capita (State + Local)	1957–1970 Panel		1957–2000 Panel	
	(a)	(b)	(a)	(b)
Party Organization	.026	−.074***	−.22***	−.037**
	(.081)	(.024)	(.079)	(.015)
Ln Income Per Capita	.36	.84***	.20	.45***
	(.28)	(.10)	(.19)	(.079)
Ln Fed Aid Per Capita	–	.30***	–	.25***
		(.034)		(.020)
Ln Density	−.15***	.0069	−.57***	−.0063
	(.045)	(.012)	(.14)	(.030)
Legislative Party Strength	−.11*	−.013	–	–
	(.060)	(.024)		
Ln Population	−.127***	−.0069	–	–
	(.043)	(.014)		
Elderly	1.29	.31	1.37	−.63
	(1.89)	(.68)	(1.52)	(.53)
Schoolage	.39	.65	.82	−1.13***
	(1.75)	(.68)	(1.00)	(.35)
Dem Leg Seat Share	.19	−.12*	.06	−.059**
	(.18)	(.067)	(.13)	(.028)
Avg Dem Vote Share	.56	.0054	.16	−.11
	(.39)	(.18)	(.18)	(.09)
Divided Govt (dummy)	−.015	−.0021	.011	.0012
	(.025)	(.0090)	(.012)	(.0044)
South (dummy)	−.075	−.015	–	–
	(.11)	(.037)		
Upper House Seats	.0019	.0015	.0072	.00064
	(.0025)	(.0012)	(.0076)	(.0013)
Lower House Seats	−.00039	−.00043***	−.00046	.00034**
	(.00044)	(.00011)	(.00070)	(.00016)
Initiative (dummy)	.00020	−.035*	–	–
	(.093)	(.020)		
State fixed effects	No	Yes	No	Yes
R-squared	.83	.93	.94	.98
N	644	644	2024	2024

OLS regression with standard errors clustered by state and year dummies included in all specifications. *p < .10; **p < .05; ***p < .01.

Discussion and Conclusion

This article has offered a new understanding of how and why strong political parties change the preferences of legislators for distributive spending versus public goods. While much of the literature on parties and spending in the United States has focused on the role of parties in the legislature, we have shown how the environment *outside* the legislature, especially the electoral situation, can have a significant impact on decisions made *inside* the legislature. Moreover, party organizational structure outside the legislature may be one of the more important aspects shaping how the electoral environment affects legislator behavior. To summarize our perspective, legislators in

political parties that offer significant resources in elections receive a smaller return on distributive spending, since the "personal vote" and credit claiming are less important than in a world with weak parties. This has the direct effect of reducing the demand for distributive spending and the indirect effect of increasing the demand for spending on public goods benefitting all districts, with a net effect of producing lower and more efficient spending. Using data from 1957–2000, we demonstrate that U.S. states with strong parties have consistently spent less than states with weak parties. We also find some evidence that during this time period, states with strong party organizations received less in federal aid, consistent with the idea that members of Congress from strong party states felt less of a need to bring aid back home.

Our model and empirical findings for the United States fit naturally into a large comparative literature that provides both intuition and a substantive foundation for connecting party organizations and government spending. This literature focuses on individual countries as well as cross-national data analyses and theoretical explorations.[32] The single-country studies provide evidence of the link between pork and party strength. For instance, Keefer and Khemani (2009) use data from constituency development funds in India to show that legislators in party strongholds are less likely to secure pork for their constituents. The theoretical and cross-national literature, which typically focuses on the influence of party fragmentation, electoral systems, and federalism, reinforces the link between parties and spending. For instance, Rodden (2005) shows that countries in which the same party has tight control of national and subnational governments tend to spend less because party cohesion prevents subnational governments from behaving irresponsibly in anticipation of a federal bailout.

The formal and empirical results presented in our article, together with the larger comparative literature, suggest promising directions for future work. For example, we need tighter comparisons across electoral systems, perhaps case studies exploiting changes within countries. We also need more objective measures of party organizational strength that are comparable over time. In addition, our article raises new substantive questions. Does stronger party organizational structure in the electoral environment translate into greater party cohesion in legislative voting? Our current model cannot address this, but one could imagine a model in which weights on taxation and/or the benefits of public goods, influenced by party, could have such an impact.

[32]For studies focusing on a single geographical area, see, for example, Ames (1995, 2001); McCubbins and Rosenbluth (1995); Curtis (2002); Samuels (2002); Chhibber and Nooruddin (2004); Hallerberg and Marier (2004); and Keefer and Khemani (2009). For theoretical and cross-national work, see, for example, Perotti and Kontopoulos (2002); Scartascini and Crain (2002); Persson, Roland, and Tabellini (2007); Persson and Tabellini (2004); Lizzeri and Persico (2005); and Bawn and Rosenbluth (2006).

Proofs

Remark A1. Let $(\hat{X}, \hat{\mathbf{z}})$ be the socially optimal policy vector. Then $\hat{z}_i = 0$ for all $i = 1, \ldots, n$, and $\hat{X}$ solves $Nb'(\hat{X}) = c'(\hat{X})$.

Proof. Differentiating (2) yields:

$$\frac{\partial U}{\partial X} = Nb'(\hat{X}) - c'(\hat{X} + \hat{Z}) = 0 \tag{4}$$

$$\frac{\partial U}{\partial z_i} = \frac{N}{n}[1 - c'(\hat{X} + \hat{Z})] = 0 \tag{5}$$

Since $c' > 1$, $\partial U/\partial z_i$ is always negative, so $\hat{z}_i = 0$ (corner solution), implying $\hat{Z} = 0$. Substituting this optimal value of $\hat{Z}$ into (4) yields the condition for $\hat{X}$. *QED*

Remark A2. The ideal policy vector for legislator i, $(\bar{X}, \bar{\mathbf{z}})$, consists of a smaller-than-optimal public good $\bar{X}$, $\bar{z}_j = 0$ for $j \neq i$, and $\bar{z}_i > 0$, where $\bar{z}_i$ solves (7).

Proof. Differentiating (1) yields:

$$\frac{\partial U}{\partial X} = \frac{1}{n}[Nb'(\bar{X}) - c'(\bar{X} + \bar{Z})] = 0 \tag{6}$$

$$\frac{\partial U}{\partial z_i} = \frac{N}{n}[1 - c'(\bar{X} + \bar{Z})/n] = 0 \tag{7}$$

$$\frac{\partial U}{\partial z_j} = -\frac{N}{n^2}c'(\bar{X} + \bar{Z}) = 0 \tag{8}$$

Since $c' > 1$, $\partial U/\partial z_j$ is always negative, so $\bar{z}_j = 0$ (corner solution). Next, $\bar{z}_i > 0$ and $\bar{X} > 0$ solve (6) and (7) (assuming an interior solution) such that $c'(\bar{X} + \bar{Z}) = n$ and $b'(\bar{X}) = n/N$. Since $c''(X + Z) > 0$ and $b''(X) < 0$, $\bar{X} < \hat{X}$. *QED*

Remark A3. Let $(\tilde{X}, \tilde{z}_i)$ be optimal for legislator i given the behavior of all other legislators, who are assumed to select the projects for their districts. Then, $\partial \tilde{z}_i/\partial \alpha > 0$; $\partial \tilde{X}/\partial \alpha < 0$; and $\partial(\tilde{X} + \tilde{Z})/\partial \alpha > 0$.

Proof. Differentiating (3) yields:

$$\frac{\partial U}{\partial X} = \frac{1}{n}[Nb'(\tilde{X}) - c'(\tilde{X} + \tilde{Z})] = 0 \tag{9}$$

$$\frac{\partial U}{\partial z_i} = \frac{N}{n}[\alpha - c'(\tilde{X} + \tilde{Z})/n] = 0 \qquad (10)$$

We can combine (9) and (10) to obtain $n\alpha = Nb'(\tilde{X})$. Since $b''(X) < 0$ by assumption, this implies $\partial \tilde{X}/\partial\alpha < 0$. Next, we can rewrite (10) as $n\alpha = c'(\tilde{X} + \tilde{Z})$. Since $c''(\tilde{X} + \tilde{Z}) > 0$, this implies that $\partial(\tilde{X} + \tilde{Z})/\partial\alpha > 0$, implying that total spending is increasing in α. These two results imply that $\partial \tilde{z}_i/\partial\alpha > 0$. *QED*

Proposition A1. *In the stationary subgame perfect Nash equilibrium of the game,* $\partial(X^* + Z^*)/\partial\alpha > 0$, $\partial X^*/\partial\alpha < 0$, *and* $\partial Z^*/\partial\alpha > 0$.

Proof. Denote i as the agenda setter and k as any other legislator receiving a project in the bill. The agenda setter maximizes

$$\frac{1}{n}[\alpha N z_i + Nb(X) - c(X + Z)] + \lambda\left(\frac{1}{n}[\alpha N z_k + Nb(X) - c(X + Z)] - \delta v\right),$$

where $v = \frac{\alpha N}{n}[\frac{z_i^*}{n} + \frac{(q-1)z_k^*}{n}] + \frac{1}{n}[Nb(X^*) - c(X^* + Z^*)]$ is the equilibrium continuation value of a legislator receiving an offer from the agenda setter.

The first order conditions are as follows:

$$\frac{\partial L}{\partial X} = \frac{(1+\lambda)}{n}[Nb'(X^*) - c'(X^* + Z^*)] = 0 \qquad (11)$$

$$\frac{\partial L}{\partial z_i} = \frac{N}{n}[\alpha - (1+\lambda)c'(X^* + Z^*)/n] = 0 \qquad (12)$$

$$\frac{\partial L}{\partial z_k} = \frac{N}{n}[\lambda\alpha - (q-1)(1+\lambda)c'(X^* + Z^*)/n] = 0 \qquad (13)$$

$$\frac{\partial L}{\partial \lambda} = \frac{1}{n}[\alpha N z_k^* + Nb(X^*) - c(X^* + Z^*)] - \delta v = 0. \qquad (14)$$

We can simplify the above as follows:

$$(11) \text{ implies } \quad Nb'(X^*) = c'(X^* + Z^*). \qquad (15)$$

$$(12) \text{ implies } \quad \alpha n = (1+\lambda)c'(X^* + Z^*). \qquad (16)$$

$$(13) \text{ implies } \quad \lambda\alpha n = (q-1)(1+\lambda)c'(X^* + Z^*). \qquad (17)$$

First, taking second order conditions on (11)–(14), and using the assumption that $b''(X) < 0$ and $c''(X + Z) > 0$, it follows that we are working with maxima and not minima. Next, we establish that λ^* is independent of α. To see this, note that (16) and (17) imply that $\lambda^* = (q-1)$. Next, from (16) and (17), it follows that $(X^* + Z^*) = (c')^{-1}(\frac{\alpha n}{q})$. From (15) and (16) it follows that $X^* = (b')^{-1}(\frac{\alpha n}{Nq})$. Combining these two facts gives $Z^* = (c')^{-1}(\frac{\alpha n}{q}) - (b')^{-1}(\frac{\alpha n}{Nq})$. $(c')^{-1}$ is increasing (since c' is, by assumption) and $(b')^{-1}$ is decreasing (since b' is, by assumption). It immediately follows that $\partial(X^* + Z^*)/\partial\alpha > 0$ and $\partial X^*/\partial\alpha < 0$, which in turn implies $\partial Z^*/\partial\alpha > 0$.

As in other models of this type (Baron 1993), the continuation value v is an expected value determined in equilibrium and is, therefore, treated as a constant when taking first order conditions. Allowing v to vary when taking first order conditions would imply that the agenda setter is also determining the choice of X and Z for future agenda setters. The value of v is determined when the first order conditions are used to solve for the equilibrium values of the individual projects. For this to be an equilibrium, we must ensure that the continuation value, which is a function of the agenda setter's proposal, is consistent with maximizing behavior. In this model, X^* and Z^* can be determined without reference to v, but v is needed to fix the values of z_i^* and z_k^*. Using (14) and substituting the formula for v provided earlier gives $\frac{(1-\delta)}{n}[Nb(X^*) - c(X^* + Z^*)] + \frac{\alpha N}{n}[z_k^* - \delta\frac{z_k^*(q-1)}{n} - \delta\frac{z_i^*}{n}] = 0$. Because by construction $Z^* = \frac{N}{n}(z_i^* + (q-1)z_k^*)$, we can solve for both z_k^* and z_i^*, with $z_k^* = \frac{\delta Z^*}{N} - \frac{(1-\delta)}{\alpha N}(Nb(X^*) - c(X^* + Z^*))$ and $z_i^* = (n - (q-1)\delta)\frac{Z^*}{N} + \frac{(q-1)(1-\delta)}{\alpha N}(Nb(X^*) - c(X^* + Z^*))$. (This is a slight abuse of notation, since technically Z^* is comprised of z_i^* and z_k^*. However, Z^* can be treated as fixed here, since it was determined earlier.) Note that if $\delta = 1$, this reduces down to a simple relationship between z_i^* and z_k^*, with $z_i^* = (n - q + 1)z_k^*$, reflecting the agenda setter's advantage in the legislative process. *QED*

Remarks A4 and A5. Proof follows immediately from the proof of Proposition A1.

References

Alvarez, R. Michael, and Jason L. Saving. 1997. "Deficits, Democrats, and Distributive Benefits: Congressional Elections and the Pork Barrel in the 1980s." *Political Research Quarterly* 50(4): 809–31.

American Political Science Association. 1950. "Toward a More Responsible Two-Party System: A Report of the Committee on Political Parties." *American Political Science Review* 44(3, part 2).

Ames, Barry. 1995. "Electoral Strategy under Open-List Proportional Representation." *American Journal of Political Science* 39(2): 406–33.

Ames, Barry. 2001. *The Deadlock of Democracy in Brazil*. Ann Arbor: University of Michigan Press.

Ansolabehere, Stephen, and James M. Snyder, Jr. 2002. "The Incumbency Advantage in U.S. Elections: An Analysis of

State and Federal Offices, 1942–2000." *Election Law Journal* 1(3): 315–38.

Ashworth, Scott, and Ethan Bueno de Mesquita. 2006. "Delivering the Goods: Legislative Particularism in Different Electoral and Institutional Settings." *Journal of Politics* 68(1): 168–79.

Baron, David P. 1993. "A Theory of Collective Choice for Government Programs." Research Paper No. 1240. Stanford Graduate School of Business.

Baron, David P., and John A. Ferejohn. 1989. "Bargaining in Legislatures." *American Political Science Review* 83(4): 1181–1206.

Battaglini, Marco, and Stephen Coate. 2008. "A Dynamic Theory of Public Spending, Taxation, and Debt." *American Economic Review* 98(1): 201–36.

Bawn, Kathleen, and Frances Rosenbluth. 2006. "Short versus Long Coalitions: Electoral Accountability and the Size of the Public Sector." *American Journal of Political Science* 50(2): 251–65.

Beck, Nathaniel, and Jonathan N. Katz. 1995. "What to Do (and Not to Do) with Time-Series Cross-Section Data." *American Political Science Review* 89(3): 634–47.

Bertrand, Marianne, Esther Duflo, and Sendhil Mullainathan. 2004. "How Much Should We Trust Differences-in-Differences Estimates?" *Quarterly Journal of Economics* 119(1): 249–75.

Book of the States. Various Years. Lexington, KY: Council of State Governments.

Burnham, W. Dean. 1985. *Partisan Division of American State Governments, 1834–1985* [Computer file]. Ann Arbor, MI: ICPSR.

Cain, Bruce, John Ferejohn, and Morris Fiorina. 1987. *The Personal Vote*. Cambridge, MA: Harvard University Press.

Chari, V. V., Larry E. Jones, and Ramon Marimon. 1997. "The Economics of Split-Ticket Voting in Representative Democracies." *American Economic Review* 87(5): 957–76.

Chhibber, Pradeep, and Irfan Nooruddin. 2004. "Do Party Systems Count? The Number of Parties and Government Performance in the Indian States." *Comparative Political Studies* 37(2): 152–87.

Cox, Gary W., and Mathew D. McCubbins. 1986. "Electoral Politics as a Redistributive Game." *Journal of Politics* 48(2): 370–89.

Cox, Gary W., and Mathew D. McCubbins. 1993. *Legislative Leviathan: Party Government in the House*. Berkeley: University of California Press.

Curtis, Gerald L. 2002. "Politicians and Bureaucrats: What's Wrong and What's to Be Done?" In *Policymaking in Japan: Defining the Role of Politicians*, ed. Gerald L. Curtis. Tokyo: Japan Center for International Exchange, 1–17.

Dixit, Avinash, and John Londregan. 1995. "Redistributive Politics and Economic Efficiency." *American Political Science Review* 89(4): 856–66.

Fiorina, Morris P. 1980. "The Decline of Collective Responsibility in American Politics." *Daedalus* 109(3): 25–45.

Fitts, Michael A., and Robert P. Inman. 1992. "Controlling Congress: Presidential Influence in Domestic Fiscal Policy." *Georgetown Law Journal* 80(5): 1737–85.

Gilligan, Thomas W., and John G. Matsusaka. 1995. "Deviations From Constituent Interests: The Role of Legislative Structure and Political Parties in the States." *Economic Inquiry* 33(3): 383–401.

Gilligan, Thomas W., and John G. Matsusaka. 2001. "Fiscal Policy, Legislature Size, and Political Parties: Evidence from the First Half of the Twentieth Century." *National Tax Journal* 54(1): 57–82.

Golden, Miriam A., and Lucio Picci. 2008. "Pork-Barrel Politics in Postwar Italy, 1953-94." *American Journal of Political Science* 52(2): 268–89.

Grossman, Gene M., and Elhanan Helpman. 2008. "Party Discipline and Pork-Barrel Politics." In *Institutions and Economic Performance*, ed. Elhanan Helpman. Cambridge, MA: Harvard University Press, 329–60.

Hallerberg, Mark, and Patrik Marier. 2004. "Executive Authority, the Personal Vote, and Budget Discipline in Latin American and Caribbean Countries." *American Journal of Political Science* 48(3): 571–87.

Inman, Robert P., and Michael A. Fitts. 1990. "Political Institutions and Fiscal Policy: Evidence from the U.S. Historical Record." *Journal of Law, Economics, and Organization* 6 (special issue): 79–132.

Jones, Mark P., Pablo Sanguinetti, and Mariano Tommasi. 2000. "Politics, Institutions, and Fiscal Performance in a Federal System: An Analysis of the Argentine Provinces." *Journal of Development Economics* 61(2): 305–33.

Keefer, Philip, and Stuti Khemani. 2009. "When Do Legislators Pass on Pork? The Role of Political Parties in Determining Legislator Effort." *American Political Science Review* 103(1): 99–112.

Key, V. O. 1964. *Politics, Parties, and Pressure Groups*. New York: Crowell.

Larcinese, Valentino, James M. Snyder, Jr., and Cecilia Testa. 2006. "Testing Models of Distributive Politics Using Exit Polls to Measure Voter Preferences and Partisanship." Unpublished manuscript, LSE.

Leblanc, William, James M. Snyder, Jr., and Micky Tripathi. 2000. "Majority-rule Bargaining and the Under Provision of Public Investment Goods." *Journal of Public Economics* 75(1): 21–47.

Levitt, Steven D., and James M. Snyder, Jr. 1997. "The Impact of Federal Spending on House Election Outcomes." *Journal of Political Economy* 105(1): 30–53.

Lindbeck, Assar, and Jorgen W. Weibull. 1987. "Balanced-budget Redistribution as the Outcome of Political Competition." *Public Choice* 52(3): 273–97.

Lizzeri, Alessandro, and Nicola Persico. 2005. "A Drawback of Electoral Competition." *Journal of the European Economic Association* 3(6): 1318–45.

Matsusaka, John G. 1995. "Fiscal Effects of the Voter Initiative: Evidence from the Last 30 Years." *Journal of Political Economy* 103(3): 587–623.

Mayhew, David. 1986. *Placing Parties in American Politics*. Princeton, NJ: Princeton University Press.

Mayhew, David R. 1974. *Congress: The Electoral Connection*. New Haven, CT: Yale University Press.

McCubbins, Mathew D., and Frances McCall Rosenbluth. 1995. "Party Provision for Personal Politics: Dividing the Vote in

Japan." In *Structure and Policy in Japan and the United States*, ed. Peter F. Cowhey and Mathew D. McCubbins. Cambridge: Cambridge University Press, 35–55.

McCubbins, Mathew D., and Thomas Schwartz. 1988. "Congress, the Courts, and Public Policy: Consequences of the One Man, One Vote Rule." *American Journal of Political Science* 32(2): 388–415.

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

Milgrom, Paul, and John Roberts. 1992. *Economics, Organization and Management*. Englewood Cliffs, NJ: Prentice-Hall.

Nielson, Daniel L. 2002. "Electing to Develop: The Political Economy of Reform." Book manuscript, Brigham Young University.

Perotti, Roberto, and Yianos Kontopoulos. 2002. "Fragmented Fiscal Policy." *Journal of Public Economics* 86(2): 191–222.

Persson, Torsten, Gerard Roland, and Guido Tabellini. 2007. "Electoral Rules and Government Spending in Parliamentary Democracies." *Quarterly Journal of Political Science* 2(2): 155–88.

Persson, Torsten, and Guido Tabellini. 1999. "The Size and Scope of Government: Comparative Politics with Rational Politicians." *European Economic Review* 43(4-6): 699–735.

Persson, Torsten, and Guido Tabellini. 2004. "Constitutions and Economic Policy." *Journal of Economic Perspectives* 18(1): 75–98.

Poole, Keith T., and Howard Rosenthal. 1997. *Congress: A Political-Economic History of Roll Call Voting*. New York: Oxford University Press.

Ranney, Austin. 1962. *The Doctrine of Responsible Party Government*. Urbana: University of Illinois Press.

Rodden, Jonathan A. 2005. *Hamilton's Paradox: The Promise and Peril of Fiscal Federalism.* New York: Cambridge University Press.

Rohde, David W. 1991. *Parties and Leaders in the Postreform House*. Chicago: University of Chicago Press.

Samuels, David J. 2002. "Pork Barreling Is Not Credit Claiming or Advertising: Campaign Finance and the Sources of the Personal Vote in Brazil." *Journal of Politics* 64(3): 845–63.

Scartascini, Carlos G., and W. Mark Crain. 2002. "The Size and Composition of Government Spending in Multi-Party Systems." Unpublished manuscript, Inter-American Development Bank and George Mason University.

Schattschneider, E. E. 1942. *Party Government*. New York: Farrar and Rinehart.

Shepsle, Kenneth A. 1989. "The Changing Textbook Congress." In *Can the Government Govern?*, ed. John Chubb and Paul Peterson. Washington, DC: Brookings Institution Press, 238–67.

Stein, Robert M., and Kenneth N. Bickers. 1994. "Congressional Elections and the Pork Barrel." *Journal of Politics* 56(2): 377–99.

Volden, Craig, and Alan E. Wiseman. 2007. "Bargaining in Legislatures over Particularistic and Collective Goods." *American Political Science Review* 101(1): 79–92.

Weingast, Barry R., Kenneth A. Shepsle, and Christopher Johnsen. 1981. "The Political Economy of Benefits and Costs: A Neoclassical Approach to Distributive Politics." *Journal of Political Economy* 89(4): 642–64.

Wilson, Woodrow. 1885. *Congressional Government*. New York: Houghton Mifflin.

Wolfinger, Raymond E., and Joan Heifetz. 1965. "Safe Seats, Seniority, and Power in Congress." *American Political Science Review* 59(2): 337–49.

Zeller, Belle. 1954. *American State Legislatures*. New York: Crowell.