Regional grants as pork barrel politics[*]

Kevin Milligan[†]
and
Michael Smart[‡]

March 22, 2005

Abstract

We investigate the political and economic factors influencing the allocation of regional development grants for a panel of Canadian electoral districts in the 1988-2001 period. In a strong party system such as Canada's, models of political competition predict little role for individual legislators, as party leaders allocate resources to maximize party success. While spending is targeted toward some "swing" districts, we do also find it is higher in districts represented by members of the government party, especially those in the federal Cabinet, and those of lower seniority. We develop a model featuring bargaining over legislative and non-legislative favours that is consistent with the evidence.

1 Introduction

Governments in many countries have long pursued an activist approach to industrial policy, targeting infrastructure spending and other capital subsidies to economically backward regions. In the United States, federal spending on community and regional development programs is projected to be $16.2 billion in 2005 (Office of Management and Budget, 2004). This amount is dispersed across several departments and agencies, including regional bodies such as the Appalachian Regional Commission and the Delta Regional Authority. In Europe, approximately one-third of total European Union spending aims to reduce regional disparities through such programs as the European Regional Development Fund (European Commission, 2005).

In the conventional view, subsidies of this kind serve to ameliorate capital market failures and coordination failures associated with agglomeration economies. But more cynical observers have also pointed to overt political motivations for regional development programs. Because the spending is typically discretionary rather than formula-driven, and the effects of the spending are highly visible to the electorate, regional development programs frequently have the whiff of the pork barrel about them.

To contribute to an understanding of these issues, we present evidence on the allocation of transfers by two Canadian federal government agencies with a mandate to enhance regional development in Canada's poorest provinces. The programs, known as Atlantic Canada Opportunities Agency and Economic Development Agency of Canada for Quebec Regions, make transfers to businesses, non-governmental organizations, and local governments for a wide variety of capital projects. Importantly, funding decisions of the agencies are discretionary, rather than driven by formula, which some observers have suggested may increase the potential for funds to be diverted to serve political objectives. Our data cover the 1988-2001 period, during which two different political parties were in power federally in Canada, and cover two regions (Quebec and the Atlantic provinces) with distinctly different economic and demographic environments.

If regional grants are a political tool, then what ends do they serve? Previous research has stressed two distinct political roles for redistributive spending programs. In one perspective, parties are paramount—pork barrel programs are "vote-buying" schemes that mediate electoral competition among political parties. The spending decision is centralized among party decision makers, with no role for individual legislators. A key empirical prediction emerging from this perspective is that spending will be allocated disproportionately towards swing districts where voters do not have a strong attachment to either the government or opposition parties (Lindbeck and Weibull, 1987; Dixit and Londregan, 1995).

An alternative perspective emphasizes the role of pork barrel programs in cementing bargains among individual legislators and in building cohesion within governing legislative coalitions. A long-standing literature has investigated the political determinants of the allocation of government spending in the United States. In the standard view, parties play a relatively weak role in legislative matters, distributive politics is decentralized, and the seniority and committee assignments of individual legislators are decisive in the allocation of spending, while party electoral considerations matter correspondingly little.[1]

Given the historically strong position of political parties in Canada, electoral competition theories of government spending seem far more apt in the Canadian context than the legislative bargain-

---

[1] One exception is Levitt and Snyder (1995), who investigate the role of political parties in Congressional spending decisions. They find evidence that spending is tilted towards districts controlled by the majority party in Congress.

ing hypothesis. Governments in Canada typically enforce strict party discipline in legislative votes through the use of confidence procedures; parties typically form majority governments without the need for cross-party coalitions; and party leaders control the party nomination process for individual legislative candidates, and may retain power without regard to support from the Parliamentary caucus. In short, Members of Parliament (MPs) only rarely vote across party lines. Diermeier and Feddersen (1998) show that the use of confidence procedures allows party leadership to obtain a greater proportion of the rents associated with government spending programs. Related, Persson, Roland, and Tabellini (2000) suggest that such institutions allow parties to target spending at swing electoral districts.

Nevertheless, anecdotal evidence suggests—and our research confirms—that legislator characteristics still play a role in the allocation of spending, in a strong-party system like Canada's, as elsewhere. Our empirical strategy is to regress per capita regional development spending for each electoral district and year on measures of political factors, together with economic and demographic controls that may influence funding decisions. (We control for unobservable factors with year and district fixed effects.) We find government spending is significantly related to members' party affiliations, to their status within the hierarchy of the governing party, and to their tenure in Parliament, as well as to electoral competitiveness.[2]

This pattern of spending presents a puzzle. In a strong party system such as Canada's, the conventional view suggests that MPs are mere cannon fodder and have no role in determining spending. To account for these facts, we provide a simple formal model of legislative bargaining in a parliamentary system, of the type proposed by Baron and Ferejohn (1989). In the model, proposal power rests with the Prime Minister, who allocates government spending among districts to maximize future electoral returns, while maintaining legislative support from a simple majority of legislators. In addition to government spending, the Prime Minister may offer legislators other, off-budget favours, such as appointments to government bodies, preferment within the party, and so on. The key prediction of the model is that government spending is offered disproportionately to members who value their seats more, while support of other members is efficiently purchased with off-budget political favours. Our model therefore embeds aspects of both the legislative bargaining and the electoral competition frameworks. This is our primary theoretical contribution.

The model is consistent with our finding of greater spending allocated to Cabinet ministers—who require a seat in Parliament to retain their portfolios—and members of relatively short tenure, for whom the probability of standing for reelection is greater. Likewise, it is consistent with the more pronounced targeting of spending to swing districts held by opposition than by government members.

Our measure of the electoral competitiveness of each district is the relevant vote margin—the absolute value of the percentage difference in votes for the government party and the maximum of those received by an opposition party in the preceding general election. One possible objection to our results is that the government vote share and spending in each district are both affected by unobservable trends; indeed, if a positive trend in spending were causing an increase in the government vote share rather than the reverse, this might explain the pattern of correlations we observe in government and opposition districts. To account for this possibility, we also present instrumental-variables estimates, which exploit exogenous variation in the government vote share

---

[2]Indeed, our research is not the first to point out the role of individual legislators in Westminster systems. Cain, Ferejohn and Fiorina (1987) document the rise in influence of backbench MPs in UK politics. But this has been associated with a relaxation of party discipline in UK House votes, a phenomenon that has not occurred in Canada.

induced by personal characteristics of government and opposition candidates. Consistent with this view, our IV estimates show a much stronger role of electoral competition effects in explaining the allocation of spending.

Our work is related to several other empirical papers. Some recent empirical research has found evidence that electoral competition influences the allocation of discretionary government spending. Dahlberg and Johansson (2002) study the political allocation of an environmental spending program in Sweden, finding support for models suggesting politicians target swing voters. Dasgupta, Dhillon, and Dutta (2002) find support for a swing voter model of the allocation grants from central to state governments in India, and Cadot, Röller, and Stephan (2002) reach similar conclusions on the regional allocation of spending on roads in France. Crampton (2004) examines the allocation of job training grants in Canada in the 1990s, finding some evidence of spending targeted to swing districts and districts of Cabinet ministers. Strömberg (2004) examines the allocation of New Deal spending among US counties and argues that, controlling for unemployment and other measures of need, spending was greater where voters had better access to news media.

While the consistent pattern of evidence across countries with different institutional settings in favour of swing voter models is informative, our approach differs in three important ways. First, we include several measures that provide evidence on both the electoral competition and legislative bargaining models. Second, we offer a theoretical framework that reconciles existing models with our empirical findings. Finally, we directly address the potential endogeneity of political variables to spending.

The rest of the paper proceeds as follows. Section 2 presents a motivating theory of legislative bargaining with budgetary and off-budget favours. Section 3 describes the relevant institutions in Canada. Section 4 describes our data and Section 5 our estimates, while Section 6 concludes the paper.

2 A model

We consider a game consisting of n members of the legislature, where n is odd, and a single incumbent government leader, the Prime Minister. For simplicity, the Prime Minister is taken not to be a member of the legislature; this is unimportant for what follows.

The agents play a legislative bargaining game of the type introduced by Baron and Ferejohn (1989), but with a single proposal round. Initially, the Prime Minister proposes an allocation of government spending shares for each legislative district $(x_1^G, \ldots, x_n^G)$, together with a vector of extra-legislative favours to MPs $(y_1, \ldots, y_n)$. These favours are conditional on the outcome of subsequent voting; that is, each member receives the promised y_i if the government spending proposal is adopted by the legislature, and receive zero otherwise. Legislative voting is under a closed procedural rule: if a simple majority votes yes, then the proposal is implemented; otherwise, each district receives a status quo spending level $\bar{x}_i$. In what follows, we therefore say $W \subset N$ is a *winning coalition* if it comprises at least half the legislature.

Given the spending allocation x that is implemented, legislative elections are held. Voting in each district is on a first-past-the-post basis. Voters are non-strategic agents in the model, and they vote retrospectively, on the basis of observed spending decisions. To capture this, we merely posit that the probability the candidate of the government party in district i is returned is some increasing, concave function of local spending $p_i(x_i)$, and electoral outcomes are independent among districts.

Following the election, there are no further spending decisions, but the Prime Minister and

individual members collect rents if they are returned to office. It is convenient to normalize reservation utilities such that r_i represents the benefit received by member i if the government party is returned in district i. (Thus r_i will typically be positive for members of the party in government and negative for opposition members, but the magnitude of rents may differ among members of each party.) Similarly, let s be the benefit received by the Prime Minister per legislative seat won in the election. Favours y_i are transfers that enter linearly in the payoffs of all agents. Letting μ denote the (constant) marginal cost of public funds, the expected payoff of the Prime Minister is therefore

$$V(x,y) = \sum_i (p_i(x_i)s - y_i - \mu x_i)$$

The expected payoff to member i is in turn $p_i(x_i)r_i + y_i$.

Equilibrium. We seek to characterize subgame perfect equilibrium strategies of this game, defined by the vectors of government spending and conditional transfers proposed by the Prime Minister and the voting rules adopted by members. Evidently, it is a dominant strategy to offer a transfer of zero (the minimum) to all members in the event the spending proposal fails; we then may let y_i denote the transfer that is offered conditional on adoption of the proposal. Each member's expected payoff is therefore

$$u_i = \begin{cases} p_i(x_i^G)r_i + y_i & \text{if the proposal is adopted} \\ p_i(\bar{x}_i)r_i & \text{otherwise} \end{cases}$$

As is typical in this literature, we assume that a member who is indifferent between passage and failure of the government proposal will vote in its favour.

To make the problem interesting, we assume that preferences are such that positive transfers to at least some members are required to guarantee the proposal is adopted. That is, letting $\hat{x} = \arg\max \sum p_i(x_i)$, we require there does not exist a winning coalition W such that $\hat{x}_i \geq \bar{x}_i$ for all $i \in W$.

Since gaining passage of the proposal is costly, an optimal strategy offers transfers to the minimal number of members required to gain passage of the legislative proposal. In equilibrium, the proposal is supported by a minimal winning coalition, and each member is pivotal to its passage. Conditional on the Prime Minister's proposal, each member i will vote for the government proposal if and only if

$$y_i \geq \hat{y}_i(x_i^G) = \max\{[p_i(\bar{x}_i) - p_i(x_i^G)]r_i, 0\} \tag{1}$$

An optimal strategy for the Prime Minister is therefore a spending allocation x^*, a vector of conditional favours y^*, and a winning coalition of members who vote for the proposal $W^* \subset N$ that maximizes $V(x,y)$ subject to the incentive constraints (1) for $i \in W^*$. Since V is decreasing in y_i, the Prime Minister's best response proposal has (1) holding as an equality for all $i \in W$. The equilibrium proposal (x^*, W^*) therefore maximizes

$$V^*(x_1, \ldots, x_n, W) = \sum_{i \in W} [p_i(x_i)s + \min\{[p_i(x_i) - p_i(\bar{x}_i)]r_i, 0\} - mx_i]$$

Observe that V^* is concave in x for all W. The spending allocation is therefore chosen to satisfy the first order conditions

$$p_i'(x_i^*)(s + \delta_i r_i) = \mu \tag{2}$$

5

where

$$\delta_i = \begin{cases} 1 & \text{if } i \in W^* \text{ and } x_i^* \leq \bar{x}_i \\ 0 & \text{otherwise} \end{cases}$$

To better understand the implications of (2), it is useful to consider a special case that admits a closed-form solution. Let us suppose that the probability the government party is returned in i is a linear function of the utility derived from spending:

$$p_i(x_i) = \gamma_i^0 + \gamma_i u(x_i) \tag{3}$$

where $\gamma_i > 0$ is a parameter that measures the probability that increasing utility affects the electoral outcome in i, and γ_i^0 is some base level of probability. The decisive voter's utility function takes the iso-elastic form

$$u(x_i) = \frac{x_i^{1-\sigma}}{1-\sigma} \tag{4}$$

In this case, the first order conditions (2) can be solved to yield:

Proposition 1 *Assume* (3)–(4). *Equilibrium spending levels satisfy*

$$x_i^* = \frac{\gamma_i^{1/\sigma}(s + \delta_i r_i)^{1/\sigma}}{\mu^{1/\sigma}} \tag{5}$$

Thus the model incorporates aspects of both the electoral competition and legislative bargaining hypotheses. In particular, spending in each district is:

1. increasing in γ_i. This is the electoral competition hypothesis: spending is greater in swing districts, where a competitive race is anticipated, and increased government spending is more likely to tip the balance in favour of the government candidate.

2. strictly increasing in r_i if $\delta_i = 1$. Relative to what is predicted by the electoral competition hypothesis, spending is targeted more at members who assign greater value to their seats (i.e. r_i larger), if the member is part of the government coalition and loses under the government's preferred spending allocation ($x_i^* \leq \bar{x}_i$). The reason is that all members of the government coalition must be compensated in some way to ensure legislative cohesion; members who value their seats more highly are more efficiently compensated through government spending than through other transfers from the party leadership.

   A further implication of this pattern is that there is more pronounced targeting of spending to swing districts held by opposition than by government members, if the distributions of γ_i and r_i are stochastically independent among government members.

3   Institutional Background

We apply this model to the recent Canadian experience with regional development programs. Before describing our data set in the next section, we offer some details on how the regional development programs worked and on the Canadian electoral system.

3.1   Regional development programs in Canada

The federal government in Canada operates a number of agencies to deliver transfers for development assistance to underdeveloped regions of the country. Our spending data cover transfers from

two of the agencies currently known as Atlantic Canada Opportunities Agency (ACOA, for the four Atlantic provinces[3]) and Economic Development Agency of Canada for Quebec Regions (CEDQ, for the province of Quebec). The five eligible provinces are the poorest in the country in terms of per capita income and receive the bulk of regional development transfers from federal government sources.

ACOA was established in 1987 with a broad mandate to (in the language of the enabling legislation) "increase opportunity for economic development in Atlantic Canada and . . . enhance the growth of earned incomes and employment opportunities." CEDQ followed in 1991 with a similar mandate. The agencies interpret this mandate broadly, offering loans and "non-repayable contributions" to a wide variety of businesses, non-governmental organizations, and provincial and local governments for a wide variety of purposes. Recipients must apply to the agencies for funds, and eligibility is determined on a case-by-case basis according to a set of broad criteria that include incrementality, economic viability, and the like. About half of ACOA transfers are paid to businesses in the form of capital subsidies for commercial projects, and about half allocated to non-commercial projects, including operating subsidies to local economic development agencies, research centres, and industry groups; support for the construction of community centres, roads and other local public "infrastructure"; and miscellaneous specific-purpose grants to government agencies (Auditor General, 2001). The allocation of CEDQ's funds has been similar.

The amount of spending by the agencies is large. In the seven fiscal years from 1994-95 to 2000-01, transfer payments from ACOA averaged (on a public accounts basis) $285.9 million annually in real 2000 Canadian dollars, or about $130 per capita for residents of the eligible provinces. The analogous figures for CEDQ were $293.6 million annually, or $45 for each Quebec resident. Taken together, transfer payments committed by the agencies accounted for more than five per cent of total federal program spending over the period.

The discretionary nature of the funding rules have led a number of observers to suggest in the past that the agencies have been subject to political interference in the allocation of funds. Of course, previous evidence to this effect has been anecdotal at best. Government auditors have on a number of occasions taken issue with the agencies' failure to document their funding decisions adequately, and with the methodology used for cost-benefit analysis of projects. In a small number of cases, auditors have found that the agencies' own rules were ignored or evaded in the funding of projects (Auditor General, 1995, 2001). In some cases, the agencies have been embroiled in public scandals. In one example, ACOA's chief administrator resigned in 1996 amid suggestions that the political minister responsible for the agency had exerted pressure to gain funding for specific projects (see Haddow, 2001).

3.2 Elections in Canada

Canada operates a Westminster-style system of majoritarian elections, with first-past-the-post voting used to elect representatives to federal Parliament from single-member constituencies. As of 2001, there were 301 electoral constituencies represented in Parliament, 107 of them in the five provinces covered by our spending data.

Our data cover the period from 1988 to 2001, which was a period of change in Canadian politics. Traditionally, federal politics in Canada have been dominated by two major national parties, the Liberal Party and the Progressive Conservative Party. Control of the government has alternated

---

[3]These are Newfoundland, Prince Edward Island, Nova Scotia, and New Brunswick.

between these parties. For the last generation, the social-democratic New Democratic Party has also typically returned a few dozen members to Parliament. Since the 1993 federal election, however, the relative fortunes of the two major parties has changed significantly. After winning majority governments in 1984 and 1988, the Progressive Conservative Party was reduced to two seats in 1993. The Liberal Party won three consecutive majorities in the elections of 1993, 1997, and 2000.

The 1993 election also saw the rise to electoral prominence of two regional parties, the Bloc Quebecois in Quebec and the Reform Party, based in the western provinces. The Reform Party disbanded in early 2000, reconstituting itself as the Canadian Alliance in an attempt to broaden its appeal. In the 1993, 1997, and 2000 elections the Bloc and the Reform/Alliance parties held down second and third positions in parliament, with the New Democrats and Progressive Conservatives reduced to fourth and fifth places.

Some political scientists have suggested that the 1993 election was a watershed in Canadian politics, marking the end of the two major national parties as "brokerage coalitions" of diverse regional interests (Uslaner, 1990), and the rise of distinct, regional parties (see, e.g., Clarke, Jenson, LeDuc, and Pammett, 1996). Nevertheless, electoral competition naturally continued in that environment. While the Liberal Party was thought likely to gain a plurality of seats in Parliament for the foreseeable future, its ability to form majority governments[4] and hence to govern effectively was more in doubt — indeed the 2004 election returned a Liberal Party minority government. Likewise, despite the strong regional diversity in party attachments in the 1990s, many individual constituencies remained competitive. With some important exceptions, the Liberal Party typically competed against the Bloc Quebecois in Quebec, against the New Democratic Party and Progressive Conservative Party in Atlantic Canada, and against the Reform/Alliance Party in the West.

4   Data description

Our goal is to form a data set with the unit of observation being a particular electoral district in a particular year. We focus only on the five provinces covered by ACOA and CEDQ, and take the years from 1988 to 2001. We draw on three sources of information, described in detail below.

The data on regional development spending come from the spending agencies.[5] The raw data set records information on all spending commitments from April 1987 to December 2001 for ACOA, and from April 1989 to March 2001 for CEDQ. Because our other data are on a calendar year basis, we restrict attention to the years 1988-2001 for ACOA and 1989-2001 for CEDQ.

The data report the name and municipality of the transfer recipient, the date, and the amount of the transfer. To attach these data to federal electoral districts we take two steps. First, for municipalities that lie entirely within one electoral district we match the municipality observed in the data with lists of municipalities provided in the Canadian Census and from Elections Canada. For municipalities that span more than one district and for observations with missing municipality information, we match to electoral districts using recipients' postal codes.[6] We exclude payments to non-residents, to provincial government offices, and to province-wide business associations and

---

[4]Minority governments have been rare in federal politics and, unlike other countries with multi-party systems, minority parties have not formed formal coalition governments in Canada during the post-war era.

[5]The data were obtained under federal access-to-information legislation by the Canadian Taxpayers Federation, and supplied to us subsequently.

[6]Postal codes for a recipient's head office were obtained from (in the order searched) the granting agencies' own records, from provincial business registries, and finally from internet searches for the companies' own web pages and business-to-business service directories.

NGOs, as these payments are likely to have a wide impact within the region, rather than being confined to the district in which the organization's offices are located. Approximately two percent of the full sample could not be matched, and an additional 7.5 per cent were not geographically specific, leaving a total of 42,222 individual grants that are linked to electoral districts used in our analysis. Individual project spending amounts were then aggregated for each of the 1,344 district-year cells used in our analysis.

Data on electoral results and MP characteristics were obtained from the Library of Parliament. For each district, we measure closeness by the vote margin: the absolute difference between the votes received by the party in power and the best of the opposition parties, expressed as a percentage of total votes cast. The voting data were also linked to Library of Parliament records of the characteristics of members, including appointments to the federal Cabinet and year first elected. For each year in our data, we attach the political data for the most recently completed election.[7]

Data on economic and demographic characteristics of electoral districts were obtained from the quinquennial Canadian Census. When electoral district names and boundaries change due to periodic redistricting, we link successor districts together in order to construct a balanced panel for which demographic and electoral variables are defined consistently over time.[8] In six cases, a new district was created from small parts of several old ones, and it was not possible link districts over all years. these procedures could not be used consistently. In such cases, we simply deleted observations for all years. This leaves a balanced panel of 101 electoral districts in the target provinces for all years from 1988 to 2001. We link the Census data to our spending data using the most recent past Census.[9]

4.1 Descriptive Statistics

Table 1 reports statistics for the variables of interest, for the full sample as well as for the subsamples of government-held and opposition-held districts. The first row displays the spending per resident of the electoral district, which averages $52.36 overall. In government-held districts, average spending is $58.24, which is 28 per cent greater than spending in opposition-held districts.

The next rows report means of the political variables, including an indicator for government-held districts (54.3 per cent of the sample), whether the local member is a Cabinet minister (22.3 per cent of government-held districts), the percentage vote margin between the government party and the maximum of the opposition parties expressed as percentage of all votes cast (23.3 percentage points on average), and four categorical variables measuring the previous Parliamentary

---

[7]For election years, we continue to use the previous electoral results. Three of the four elections were in the Fall (1988, 1993, and 2000), while the 1997 election was in June with Parliament not sitting until the Fall. Given this timing, the great majority of the spending projects we observe in the data for these election years would have been approved by the outgoing government.

[8]Redistricting occurs roughly every ten years, once the data from the decennial census in the '1' years (1971, 1981, 1991) has been processed. Our data cover constituencies defined under each of the 1976, 1987, and 1996 Representation Orders. We linked districts under each of the three Representation Orders to construct a balanced panel. Because none of the provinces we study gained or lost districts under these three Representation Orders, the changes in riding boundaries following redistricting are in most cases minimal. We were able to link districts using information from the Library of Parliament on the history of federal ridings (for the 1987 redistricting), and by determining the district under the new Order that contains the largest fraction of postal codes in each old district (for the 1996 redistricting).

[9]For the years of the Census, we still assign the data from the previous Census so that all Census data will be predetermined rather than potentially responding to contemporaneous spending. So, the 1986 Census data is assigned to the 1988-1991 spending data, 1991 Census data to 1992-1996 spending data, and 1996 Census data to 1997-2001 spending data.

Table 1: Descriptive statistics

	Full sample	Government seats	Opposition seats
Observations	1,344	730	614
Spending per capita	52.36	58.24	45.36
	(82.13)	(88.09)	(73.89)
Government seat	0.543	1.000	0.000
Cabinet minister	0.138	0.253	0.000
Vote margin	0.233	0.254	0.208
	(0.165)	(0.180)	(0.141)
MP previous experience:			
None	0.448	0.344	0.572
1–4 years	0.310	0.389	0.215
5–9 years	0.137	0.133	0.142
10+ years	0.106	0.134	0.072
Average income	47,043	47,196	46,860
	(9232)	(10057)	(8149)
Percent in urban area	0.682	0.674	0.691
	(0.275)	(0.286)	(0.263)
Unemployment rate	0.143	0.144	0.141
	(0.057)	(0.057)	(0.057)
Participation rate	0.627	0.628	0.626
	(0.050)	(0.051)	(0.048)
Population	85,614	85,108	86,216
	(19940)	(20189)	(19641)

Notes: Reported are the means for a selection of the variables used in the analysis. Standard deviations for continuous variables lie beneath the means. All dollar values converted to 2000 Canadian dollars.

experience of the local member. Note that in 44.8 per cent of our sample, the member had no previous Parliamentary experience. Opposition-held districts were even more likely to be held by a freshman member (57.2 per cent of cases).

The final rows report statistics for certain economic and demographic control variables. These data are taken from the most recent quinquennial Census prior to the year of the spending, so that no endogenous effect of spending on local economies contaminates our estimates. In addition to those shown here, we use data on educational attainment and the age structure of the population, both of which may be determinants of the vigour of the local economy and hence the level of spending attracted to the district.

4.2 Comparison of means

We begin by establishing a prima facie case for the influence of political considerations over spending allocation, based on simple comparisons of conditional means. Figure 1 shows the average per capita level of annual spending commitments in ridings with opposition Members of Parliament, Government backbenchers, and Cabinet ministers. Ridings represented by government members received \$65.86 (in year 2000 dollars) in per capita spending each year, compared to \$48.58 in opposition ridings. But not all government MPs are equally successful in delivering support to their

Figure 1: Spending per capita, by status of local member
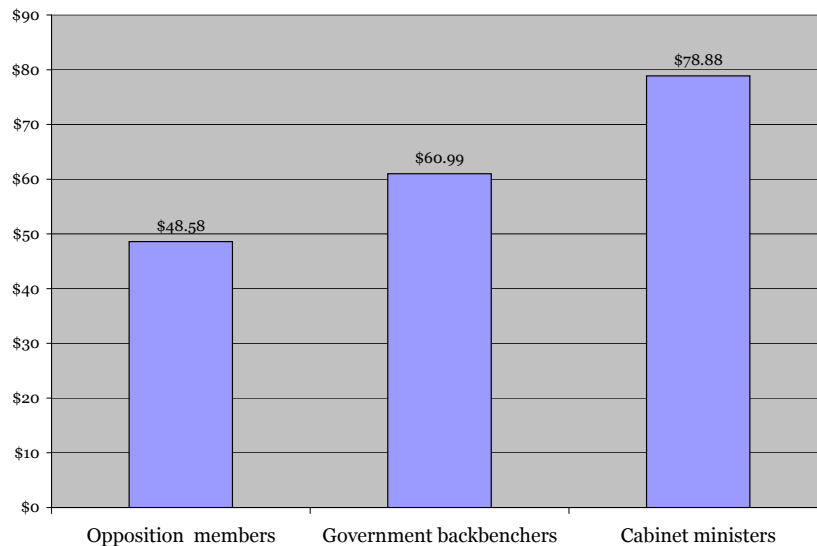
ridings. Figure 1 shows that Cabinet ministers' ridings received $78.88 per capita, compared to $60.99 per person in government backbenchers' ridings.

As our theory suggests, political influence might be used to influence future electoral outcomes, as well as to reward individual MPs. In a first-past-the-post electoral system, however, popular votes don't really matter, only seats do—and a clever politician should allocate more grants to ridings where the past margin of victory was small, and a few grant dollars are most likely to swing the riding from the opposition to the government party. To examine this possibility, we next report mean spending for quartiles of the (positive or negative) vote difference between government and opposition. Figure 2 shows the results. In ridings that had previously elected an opposition MP, the half with the closest margin of victory again have higher spending - $61.89 per capita each year for narrow margin ridings, versus $35.18 for wide margin ridings. For ridings that had elected a government MP, however, the difference is negligible. Thus the data support the idea that funds are allocated disproportionately to swing ridings that had previously gone to the opposition, but not among government districts.

While MPs have few powers of agenda control in the Canadian parliament, one member serves as minister responsible for the ACOA department and so may be able to tilt spending in his own favour.[10] The ACOA ministry has been shuffled frequently: between 1988 and 2001, no fewer than eight MPs held the portfolio. We can therefore examine how spending in each riding changes, relative to other ridings, as the local MP is promoted the ACOA portfolio.

---

[10]CEDQ, the sister agency of ACOA for Quebec, did not have its own Cabinet minister for most of our sample period.

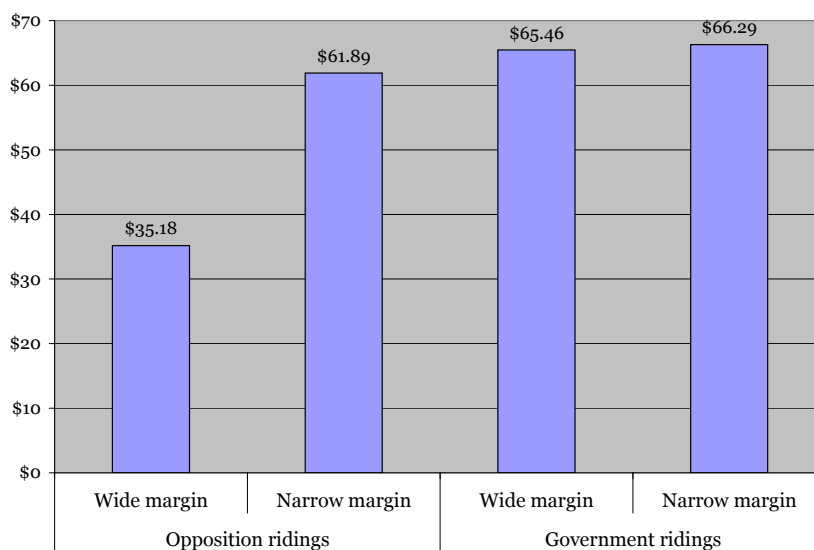Figure 2: Spending per capita, by previous vote margin

Figure 3 shows average spending in ACOA ministers' ridings, relative to baseline levels.[11] In the year following an MP's promotion to the ACOA portfolio, per capita spending in his riding increases by $153.21 on average—error bars in the figure indicate the 95 per cent confidence intervals around the point estimates. The effect is also significant in the second year after appointment, though smaller at $83.07 on average. In the third and subsequent years (when the ACOA portfolio had generally been rotated to another member), spending remains somewhat higher, but not significantly so.

5   Estimates

We present ordinary least squares and instrumental variables results for a number of specifications. In all cases the dependent variable is the per capita spending level in each district. The control variables include the political controls, which describe the characteristics of the representative and district, and economic controls, which describe local economic conditions.[12] We include both year

---

[11]That is, the figure reports regression coefficients for years since appointment to the ACOA portfolio, controlling for year and district fixed effects.

[12]The precise variables we include for the political variables are a dummy for government winning the seat, an indicator for the riding being represented by a cabinet minister, government margin, and a set of dummies for the experience of the member. For the economic controls, we include log average income, shares with terminal education at high school graduation, some post-secondary, and university degree, percent in urban areas, the unemployment rate, the participation rate, and finally age shares for the groups 15-44, 45-64, and 65 plus.

Figure 3: Spending per capita in district of ACOA ministers
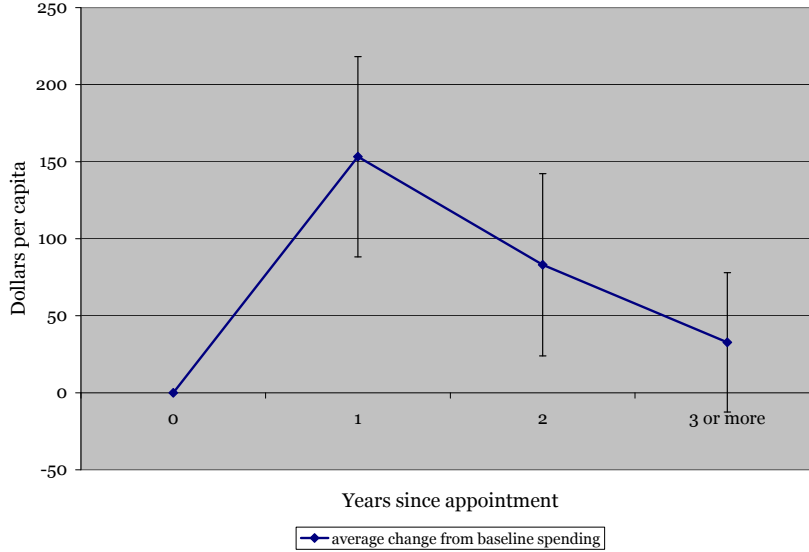
Note: Error bars indicate 95 percent confidence band.

and district fixed effects as well. All equations are of the form

$$\text{Spending}_{dt} = \beta_1 + \beta_2 \cdot \text{Politics}_{dt} + \beta_3 \cdot \text{Economics}_{dt} + \delta_d + \tau_t + \epsilon_{dt} \tag{6}$$

where d indexes districts and t indexes years, δ is a vector of district fixed effects and τ is a vector of year fixed effects.

The inclusion of year effects and district effects means that the parameters are identified by variation *within* each electoral district through time. Taking the margin variable as an example, the regression compares the spending outcome in a particular riding when the margin is low with spending in a different electoral cycle when the margin is high. Any unchanging fixed characteristics of the riding will be picked up by the fixed effect, and therefore not influence our estimates.

The variables we employ are reported with different frequency. While our dependent variable is annual, our right-hand side variables are often the same for several years since previous election results and Census data change infrequently.[13] We account for this well-known grouped variables problem by adjusting our standard errors through clustering on election cycle-electoral district cells.

---

[13]Our cabinet minister indicator variable is updated annually, but the other political variables are only updated every political cycle. The Census variables are updated every five years, following a Census.

Table 2: OLS results

	(1) SPENDPC	(2) SPENDPC	(3) SPENDPC	(4) SPENDPC
Government seat	9·97**	10·34***	8·97**	−0·05
	(3·90)	(3·99)	(3·88)	(6·71)
Vote margin	−21·46	−28·71	−23·93	−56·83*
	(18·11)	(20·23)	(21·89)	(32·11)
Government seat*Vote margin				45·32*
				(24·75)
Cabinet minister	16·30**	14·44**	16·09***	15·71**
	(6·66)	(6·03)	(6·06)	(6·10)
MP experience:				
1-4 years			7·79*	7·08*
			(4·36)	(4·30)
5-9 years			−3·17	−3·00
			(7·19)	(7·14)
10+ years			−15·56**	−16·35**
			(7·26)	(7·23)
Observations	1344	1344	1344	1344
R-squared	0·63	0·64	0·64	0·64
Economic controls	no	yes	yes	yes

Notes: Robust standard errors in parentheses, clustered on electoral district–electoral cycle groups. All specifications also include year and electoral district effects and controls percentage urban, unemployment and participation rates, education shares, age shares, and log population.
* significant at 10% level; ** significant at 5% level; *** significant at 1% level.

5.1 OLS results

Table 2 presents the OLS results. The first column shows a parsimonious specification that includes only the political variables and the district and year fixed effects. The estimated impact of being in a government-held riding is an extra $9.97 per capita, an increase of 19.0 per cent over the mean. The districts of cabinet ministers do better than other ridings, with an extra $16.30 per capita. The impact of the government margin is not significant, although the point estimate is negative.

Thus our initial results give little support for the electoral competition hypothesis: spending is not significantly greater in electorally competitive districts than safe ones. Characteristics of sitting members have more explanatory power: Government districts appear to be favoured by spending, with even more allocated to districts represented by important members—those in cabinet.

The second specification includes the economic variables, with little effect on the estimates for the political variables appearing in the table. Tested jointly, the *F*-test on the set of economic controls sharply fails to reject the null hypothesis ($p = 0.471$). This likely reflects the lack of variation within districts through time in the economic variables. Instead, the effect of the economic differences across districts is absorbed by the district fixed effects.

The third column in Table 2 includes all of the variables in the second specification, but with the addition of the three indicator variables for the previous experience of the winning candidate. (The excluded category is for having no previous experience.) The estimates for the other political

variables change little when the experience dummies are added.

Observe that the point estimates on the three experience variables suggest a "hump-shaped" effect of experience on spending, with members of 1-4 years' seniority receiving significantly more, and members of 10 or more years' seniority receiving significantly less, than freshman members. This result stands in marked contrast to much research on US redistributive politics, which typically finds a strong positive effect of legislative seniority on spending. One explanation for the result consistent with our theory is related to the career concerns of individual Members of Parliament. As members of 10 years' seniority are nearing the normal "retirement" age from the House, their demand for spending to enhance reelection probability is less, implying they are more efficiently compensated by the Prime Minister at the margin through other means. Members of shorter tenure may therefore be more interested in ensuring reelection, particularly given that full vesting of Parliamentary pension benefits occurs after serving 6 years in the House.[14]

Our theory suggests that electoral competitiveness, measured by the margin variable, should affect spending differently in government and opposition districts, but the specifications reported so far constrain the margin effect to be the same for all. The final column of Table 2 reports estimates from a specification that includes the interaction between margin and the indicator for government-held districts, thereby permitting the margin effect to differ for government and opposition districts. The point estimates of the effect of margin in opposition-held districts is -56.83, significant at the ten per cent level: the closer the race, the greater is spending. The effect of margin in government-held districts is obtained by adding this coefficient to that on the interaction term to obtain -11.56 (insignificantly different from zero). These results suggest that the electoral competition hypothesis can rationalize the pattern of spending in opposition-held districts, but not among government members, in which legislative-bargaining factors are also at work. One qualification is in order, however: if government vote shares are affected by unobservable district-level trends in spending, this might also explain the pattern of correlations we observe in government and opposition districts. This possibility is discussed further addressed in the next section.

5.2 Instrumental variables estimation

In forming our variables, we were careful to use both political and economic controls that were determined before the spending decisions in order to minimize concerns about the endogenous response of these variables to changes in government spending. However, past spending decisions may influence the current political variables as well as having some influence on current spending decisions, if spending patterns are trending through time. Indeed, standard specification tests indicate possible endogeneity of both the government margin and the government won variables.[15]

We expect that having a cabinet minister and the years of experience should not raise endo-

---

[14]Of course, a number of factors outside our theory may also lay behind the correlation between experience and spending. One possibility is that members of longer tenure are a selected group, with different characteristics than freshman. But if greater spending increases the probability of reelection, then spending would be positively related to spending through the selection effect—the opposite of what we find. Other considerations may also lead to a correlation between experience and unobservable determinants of spending—for example, repeated reelection of a member might provide information about the electoral competitiveness of the district for which the lagged vote margin is not a sufficient statistic. Because our panel is relatively short, we are unable to test this hypothesis against the alternative.

[15]Using the binary candidate experience variables (described in detail below) we performed a Durbin-Wu-Hausman test of the exogeneity of government margin and government won. The chi-squared test statistic of 5.954 has a p-value of 0.051, which indicates rejection of the null of exogeneity at the 10 percent level but not at the 5 percent level of confidence.

geneity problems. Cabinet ministers are chosen by the Prime Minister rather than by voters, so past spending should not affect whether one is chosen as a cabinet minister. For the experience measure, more spending in a given year cannot change the previously determined year of first election. Both of these assumptions hold up in formal specification tests.

Another source of potential endogeneity lies in parties' candidate selection processes. Government parties often seek to attract and elect "star" candidates by assigning them to safe districts, in which the government vote margin is large. Once elected, star candidates may in turn more effective in attracting spending to their districts. Considerations such as these may account for our finding that spending is decreasing in the vote margin for opposition districts but not for government districts.

To correct for the potential endogeneity of the margin and government-seat variables, we pursue two different instrumental variables strategies. The primary set of instruments we consider comes from our electoral data. We form variables that capture the attributes of the candidates in the election. Candidate attributes are likely to affect electoral outcomes, but the attributes of losing candidates are not very likely to affect spending decisions. We therefore form three variables indicating whether the government candidate, the major opposition candidate, and the minor opposition candidate had previous parliamentary experience.[16] Since we already include the experience of the *winning* candidate in the second stage spending equation, it seems quite plausible to posit that the experience of the party candidates be excluded from the spending equation. That is, only the experience of the winning candidate should matter for spending allocation decisions and the only way the experience of losing candidates should matter is through their impact on who wins.

The second set of instruments is drawn from the Census. We have several demographic variables that may be related to party preferences of the local electorate but can reasonably be considered unrelated to the spending decision. For this purpose we use the proportion of the population whose first language is French, the proportion whose first language is neither English nor French, and the proportion of the population that is married. These instruments are valid if the only way they influence spending is through their effect on who is elected; that spending itself does not depend directly on these attributes of the districts.

As is well known, instrumental variable estimates are consistent, but may be biased in finite samples. Having more instruments can improve the asymptotic efficiency of estimates using instrumental variables, but may result in an increased bias in the direction of the OLS estimates in finite samples.[17] Given our relatively small samples, these issues may become acute. For this reason, we show results using a parsimonious set of instruments and compare them to results with expanded sets of instruments.

Another issue arising in our application of instrumental variables is the potential heteroskedasticity of our errors. Because we are concerned that errors within each electoral cycle-electoral district cell may be correlated, we clustered our OLS standard errors. In the presence of heteroskedastic errors, estimating the two equations jointly using the Generalized Method of Moments (GMM) can improve efficiency. We therefore use our instrumental variables in GMM estimation.[18]

---

[16]We define major opposition candidate to be the candidate from the Liberal Party in the 1988 and 1993 elections. For the 1997 and 2000 elections, the major opposition candidate is the candidate for the Bloc Quebecois in Quebec, and from the Progressive Conservatives in the Atlantic provinces. For all elections, the top-placing candidate from the remaining parties is the minor opposition candidate.

[17]See, for example, Staiger and Stock (1997).

[18]Our errors terms strongly reject the homoskedastic null hypothesis in a Pagan-Hall test for heteroskedasticity. We

The choice of GMM over standard two-stage least squares is not pivotal; inferences are very similar using either method.[19]

5.2.1 Results

Table 3 reports GMM estimates. The first column has our preferred OLS specification, repeated for comparison purposes from the third column of Table 2. The second column uses the simplest set of instruments, being three binary variables indicating whether the government, major opposition, and minor opposition candidate has previously sat in parliament. Down the column, we report the F-statistics for both of the first-stage equations, followed by the information on the Hansen J-test on the exclusion of the instruments from the spending equation. The F-tests indicate the instruments are very strong predictors of whether the government won the riding, and what the government margin was. The J-test indicates that the instruments can be excluded reasonably from the spending equation, with a p value of 0.757.

The estimates using the parsimonious set of instruments in column 2 are somewhat different than the OLS estimates in column 1. The predicted impact of the government winning the seat is an increase of $43.05 in spending per capita, significant at the five percent level of confidence. This is almost five times the magnitude of the OLS coefficient. The impact of having a cabinet minister in the district is insignificantly estimated at $9.80 per capita. However, the size of the standard error means that the GMM estimate is not statistically different from the OLS estimate.

The largest difference between the first two columns is the magnitude of the vote margin coefficient, which is -225.76 with GMM. This indicates that a 10 percentage point tightening in the margin is predicted to increase spending by $22.58, or 43.1 percent of the mean. This corresponds to an elasticity evaluated at the means of -1.005. A simple heuristic may help to interpret this coefficient: Observe that, if an increase in a district's spending causes an increase in the government vote share, this will induce a positive correlation with the measured margin variable in government-held districts but a negative correlation with margin in opposition districts. Ignoring correlations with other explanatory variables, we therefore expect OLS estimates to be downward-biased for government districts and upward biased for opposition districts.[20]

The third column adds a set of three demographic instruments (proportion French, other language speaking, and married) to the three candidate experience dummies. With more instruments, the efficiency of the estimates should improve. However, the finite sample bias may worsen. The F-tests and the exclusion test indicate that these new variables both help the first stage and can be excluded reasonably from the spending equation.

The results in column 3 for the spending equation are similar to those in the second column, but are estimated with more precision. The vote margin coefficient is now significant at the five percent level, at -217.50. The other results change little, although standard errors are smaller.

In the fourth column, we use the same set of six instruments but include the interaction of government won and government margin as an additional endogenous variable. The results in column 4 provide no evidence of a different response in the two types of ridings. However, the

---

employ the IVREG2 package in Stata to perform the tests and the estimation. See Baum, Schaffer, and Stillman (2003) for details.

[19]For example, the estimate and standard error of the effect of the government candidate winning the seat in column 2 of table 3 is 43.05 (19.82) with GMM and 43.68 (19.93) with 2SLS.

[20]In fact, however, the GMM estimate of the margin effect is significantly larger in all cases than both the OLS margin effects reported in column 4 of Table 2, suggesting that more may lay behind the difference in results than is captured by the heuristic.

Table 3: GMM results

	(1) OLS	(2) GMM	(3) GMM	(4) GMM	(5) GMM
Government seat	8·97**	43·05**	42·37**	42·42	21·84***
	(3·88)	(19·82)	(16·45)	(40·71)	(8·13)
Vote margin	−23·93	−225·76*	−217·50**	−217·36	−93·01*
	(21·89)	(119·00)	(101·28)	(156·52)	(54·87)
Government seat*Vote margin				−0·22	
				(149·29)	
Cabinet minister	16·09***	9·80	8·54	8·53	10·91*
	(6·06)	(9·72)	(8·12)	(8·23)	(5·79)
MP experience:					
1-4 years	7·79*	13·20*	12·42*	12·42*	8·39*
	(4·36)	(7·28)	(6·57)	(6·61)	(4·75)
5-9 years	−3·17	8·37	7·99	7·98	−1·09
	(7·19)	(10·74)	(10·02)	(10·63)	(7·03)
10+ years	−15·56**	3·06	3·32	3·32	−7·75
	(7·26)	(14·78)	(13·21)	(13·29)	(9·12)
Observations	1344	1344	1344	1344	1344
R-squared	0·64	0·58	0·58	0·58	0·63

First stage diagnostics:

Instruments:	–	set 1	set 1,2	set 1,2	set 3,2
F-statistics for excluded instruments in equation:					
Government seat	–	28·03	33·14	33·14	23·81
Vote margin	–	13·79	9·689	0·68	7·00
Government seat*Vote margin	–	–	–	32·00	–
J-statistic (χ^2)	–	0·095	0·325	0·325	10·534
(p-value)		(0·757)	(0·988)	(0·955)	(0·395)
degrees of freedom	–	1	4	3	10

Notes: Robust standard errors in parentheses, clustered on electoral district–electoral cycle groups. All specifications also include year and electoral district effects and controls percentage urban, unemployment and participation rates, education shares, age shares, and log population. Instrument sets: (1) binary candidate experience variables; (2) language and marital variables; (3) three experience categorical variables for each candidate.
* significant at 10% level; ** significant at 5% level; *** significant at 1% level.

relative inefficiency of the GMM estimation compared to the OLS results for this specification leaves it difficult to draw any strong conclusions.

The final column in Table 3 expands the set of instruments further by more richly representing the experience of the candidates. We include dummies for having 1-4, 5-9, and 10 or more years of experience for each of the government, the major, and the minor candidate. We also include the three demographic instruments in this specification. The results show the coefficients and the standard errors cut approximately in half. This brings forward both the benefit of more instruments (increased efficiency of the estimator) and the cost (bias of results toward OLS estimates). As the F-tests are not as strong for this specification, the richer representation of candidate experience may not be providing enough explanatory power to the system of equations to be justified.

6   Conclusion

Our main finding—that political factors explain some portion of the variation in regional development assistance that economic factors cannot—should likely be of little surprise. By virtue of their flexibility, such discretionary grants are a natural vehicle for reaching the political objectives of the government of the day, as much as for targeting assistance based on economic criteria.

More surprising, perhaps, is the evidence we find of substantial and systematic asymmetries in spending that depends on the party affiliations, legislative experience, and seniority of individual legislators. Previous research, for the US in particular, has attributed similar findings to the procedural rules used in legislatures and the importance of the "personal vote" (Cain, Ferejohn, and Fiorina, 1987) in systems where political parties are weak. Yet we find such effects even in an extreme Westminster system of government as Canada's, where parties are strong, and individual legislators have no significant procedural role in forming legislation, and little bargaining power relative to party leaders. Our theory reconciles these two views by noting that even a strong party leader will cement legislative coalitions by spending disproportionately on members who value their seats more, while purchasing support of other members with off-budget political favours.

References

AUDITOR GENERAL (various years): *Report of the Auditor General of Canada*. Queen's Printer, Ottawa.

BARON, D. P., AND J. A. FEREJOHN (1989): "Bargaining in Legislatures," *American Political Science Review*, 83(4), 1181–1206.

BAUM, C. F., M. E. SCHAFFER, AND S. STILLMAN (2003): "Instrumental Variables and GMM: Estimation and testing," *The Stata Journal*, 3(1), 1–31.

CADOT, O., L.-H. RÖLLER, AND A. STEPHAN (2002): "Contribution to productivity or pork barrel? The two faces of infrastructure investment," Discussion Paper FS IV 02-09, Wissenschaftszentrum Berlin.

CAIN, B., J. FEREJOHN, AND M. FIORINA (1987): *The Personal Vote: Constituency service and electoral independence*. Harvard University Press, Cambridge MA.

CLARKE, H. D., J. JENSON, L. LEDUC, AND J. H. PAMMETT (1996): *Absent Mandate: Canadian Electoral Politics in an Era of Restructuring*. Gage, 3rd edn.

CRAMPTON, E. (2004): "Distributive politics in a strong party system: Evidence from Canadian job grant programs," Discussion paper, University of Canterbury.

DAHLBERG, M., AND E. JOHANSSON (2002): "On the Vote-Purchasing Behavior of Incumbent Governments," *American Political Science Review*, 96, 27–40.

DASGUPTA, S., A. DHILLON, AND B. DUTTA (2002): "Electoral goals and center-state transfers: A theoretical model and empirical evidence from India," Discussion paper, University of Warwick.

DIERMEIER, D., AND T. J. FEDDERSEN (1998): "Cohesion in legislatures and the vote of confidence procedure," *American Political Science Review*, 92(3), 611–621.

DIXIT, A., AND J. LONDREGAN (1995): "Redistributive politics and economic efficiency," *American Political Science Review*, 89.

EUROPEAN COMMISSION (2005): *General budget for the European Union for the financial year 2005*. Office for offical publications of the European Communities, Brussels.

HADDOW, R. (2001): "Regional development spending: A nexus of policy and politics," in *How Ottawa Spends 2001-2002*, ed. by L. A. Pal. Oxford University Press, Toronto.

LEVITT, S. D., AND J. M. SNYDER (1995): "Political parties and the distribution of federal outlays," *American Journal of Political Science*, 39, 958–980.

LINDBECK, A., AND J. WEIBULL (1987): "Balanced-budget redistribution as the outcome of political competition," *Public Choice*, 52, 273–297.

OFFICE OF MANAGEMENT AND BUDGET (2004): *Analytical Perspectives, Budget of the United States Government, FY2005*. US Government Printing Office, Washington.

PERSSON, T., G. ROLAND, AND G. TABELLINI (2000): "Comparative politics and public finance," *Journal of Political Economy*, 108, 1121–1161.

STAIGER, D., AND J. H. STOCK (1997): "Instrumental Variables Regression with Weak Instruments," *Econometrica*, 65(3), 557–586.

STRÖMBERG, D. (2004): "Radio's Impact on Public Spending," *Quarterly Journal of Economics*, 119, 189–221.

TABELLINI, G., AND T. PERSSON (1999): "The size and scope of government: Comparative politics with rational politicians," Discussion Paper 2051, Centre for Economic Policy Research.

USLANER, E. M. (1990): "Spitting image: Partisan affiliations in Canada's 'two political worlds'," *American Journal of Political Science*, 34, 961–981.