Regionalism and pork barrel politics*

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Abstract

We study the role of electoral politics in determining the interregional allocation of federal grants. We present evidence from a newly constructed data set on a program of discretionary regional development transfers from the federal government in Canada during the 1988-2000 period. Consistent with some theories, we find that spending is greater in electoral districts which are ”close races”, in the sense that the previous vote plurality was small. We also find evidence that districts represented by senior members of the government receive larger transfers, but no evidence that districts held by the government party are generally favoured. In marked contrast to the predictions of the standard theory, we find that spending is greater in districts where popular support for a regional secessionist party is stronger.

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1 Introduction

Inter-regional transfers are often viewed as the "glue" which holds federations together. Transfers serve an essential role in federal politics, addressing regional inequities, correcting externalities, and cementing bargains among regional coalitions. But critics charge that grant programs may serve more oblique political objectives as well – transfers may act less as "glue" and more as grease for the political machine.

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 1988-2000 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 funding decisions by the agencies are subject to political influences, a number of different political factors might be relevant to the pattern of spending observed. The principal hypothesis we investigate is that funding is allocated among federal electoral districts in order to maximize the number of seats won by the governing party in national elections. In this context, Lindbeck and Weibull (1987) and Dixit and Londregan (1995) have argued that political parties should allocate a disproportionate share of redistributive spending to "swing" districts where voters do not have a strong attachment to either the government or opposition parties. This leads us to investigate how measures of the closeness of races in individual electoral districts affect spending.

This focus on electoral competition among parties reflects the historically strong position of political parties in Canada, relative to the status of individual legislators. Governments typically enforce strict party discipline in legislative votes through the use of confidence procedures and perhaps through the allocation of Cabinet posts and other political patronage. Persson et al. (2000) and others have suggested that such institutions give rise to greater use of "pork-barrel" spending. But other theories assign a greater role to legislative bargaining and the characteristics of individual legislators in the allocation of government spending. We therefore also investigate the link between funding and the characteristics of individual legislators.

To investigate the determinants of funding allocation by the agencies, we regress spending per capita and the number of projects per capita in each eligible federal electoral district on a number of political measures, together with economic and demographic controls for other factors that may influence funding decisions.

Our results for spending in the Atlantic region are most consistent with the theories of electoral competition among parties. Districts that are perceived as close races by the government party receive a significantly greater share of transfers under the program than would be predicted based on their economic and demographic characteristics alone; however, the magnitude of the effect is relatively small. This result is robust to two alternative measures the closeness of electoral competition. The role of other political factors receives less support from the data. Districts held by the government party do not receive more funding in per capita terms than those that elect opposition members. There is however some evidence that districts represented by members of the federal Cabinet (who are senior members of the government party) receive more transfers. In contrast to our results for the Atlantic region, we find no evidence that transfers are allocated disproportionately to close districts in Quebec. Indeed, by one measure, transfers are significantly smaller there in close races.

Our work contributes to a small but growing empirical literature that examines the relationship between the allocation of government transfers and competition among political parties to gain office. In one recent contribution, Dahlberg and Johansson (2002) examine the allocation of special-purpose environmental grants to Swedish municipalities in 1998. Like us, they find evidence that grants are allocated strategically, with the aim of shoring up support for the governing party. Cadot et al. (2002) reach a similar conclusion on the regional allocation of spending on roads in France. In related work, Strömberg (2002) shows that political parties in the US allocate a disproportionate fraction of their campaign efforts to swing states in presidential elections, and he shows how incentives differ under the winner-take-all institutions of the electoral college compared to a system of direct voting. A long-standing literature has investigated the political determinants of the allocation of government spending in the United States. Given the weak institutions of party discipline in the US Congress, much of this literature has emphasized the characteristics of individual legislators and the role of legislative bargaining. One exception is Levitt and Snyder (1995), who investigate the role of political parties in Congressional spending decisions. In contrast to our work, they find evidence that spending is tilted towards districts controlled by the majority party in Congress.

2 Model

To motivate our empirical work, we sketch a model of electoral competition and pork barrel politics, essentially due to Lindbeck and Weibull (1987), adapted to apply to a system of single-district majoritarian elections such as Canada's. (Details on electoral institutions follow.) Our goal is a heuristic model to generate predictions about the links between characteristics of electoral constituencies and spending, which will motivate the empirical work to follow.

We consider a system with M electoral districts, and two parties which compete for seats. We label the parties L and R (for "left" and "right", though the interpretation of the labels is unimportant). Prior to the election, parties promise per capita spending amounts (x_{Li}, x_{Ri}) to voters in each district $i = 1, \ldots, M$. There are N_i voters in district i. Such promises constitute binding commitments for spending if the party is elected to office. Voters then evaluate the parties based on spending promises and on their ideological characteristics, which we take as fixed. The party attachments of individual voters in each district are unpredictable from the perspective of parties. We suppose that a typical voter in district i votes for party L, given spending promises, if

$$u(x_{Li}) \geq u(x_{Ri}) - \mu_i + \nu + \epsilon \tag{1}$$

where μ_i is a known parameter representing mean attachment of voters in i to party L, $\nu \sim G_i(\nu)$ is a random variable that is common to all voters in i, but independently distributed across districts, and $\epsilon \sim F_i(\epsilon)$ is an idiosyncratic shock to preferences, independently and identically distributed among voters in the district. Without loss of generality, let $F_i(0) = 1/2$: the median value of idiosyncratic attachment to L is zero. Thus $G_i(\nu)$ can be viewed as the cdf of party attachment for the *median* voter in district i.

Equation (1) implies, applying the law of large numbers, that the share of votes received by L in district i is, conditional on the common shock,

$$V_{Li}(x_{Li}, x_{R_i}, \nu) = F(\Delta(x_i) + \mu_i - \nu) \tag{2}$$

where $\Delta(x) \equiv u(x_{Li}) - u(x_{Ri})$ is the difference in utility derived from the spending promises of the two parties. Since the electoral system is "first-past-the-post", the probability that L wins district i is

$$\begin{aligned}\pi_{Li}(x_i) &= \text{Prob}(V_{Li}(x_i, \nu) \geq 1/2) \\ &= \text{Prob}(F_i(\Delta(x_i) + \mu_i - \nu) \geq 1/2) \\ &= G_i(\Delta(x_i) + \mu_i)\end{aligned} \tag{3}$$

Parties choose spending promises simultaneously to maximize their expected number of seats in the legislature, subject to a fixed budget constraint on total redistributive spending,

$$\sum_i N_i x_{pi} = X \qquad (p = L, R) \tag{4}$$

Party L therefore seeks to maximize $\sum_i \pi_{Li}(x_i)$ subject to (4), and taking x_R as given. Letting λ_L denote the Lagrange multiplier for (4), and using (3), the first-order conditions for L's problem are[1]

$$g_i(\Delta(x_i^*) + \mu_i)u'(x_{Li}^*) = \lambda_L N_i \tag{5}$$

where g_i is the density of G_i, evaluated at the value of the common shock that makes the median voter indifferent between the two parties.

Party R's problem is to minimize $\sum_i \pi_{Li}(x_i)$ subject to the same budget constraint. Its first-order conditions are therefore symmetric:

$$g_i(\Delta(x_i^*) + \mu_i)u'(x_{Ri}^*) = \lambda_R N_i \tag{6}$$

We therefore look for a symmetric Nash equilibrium that solves the first-order conditions, i.e. one in which $x_{Li}^* = x_{Ri}^* = x_i^*$ for all i, so that $\Delta(x_i^*) = 0$. In such an equilibrium, both parties make the same spending promises to voters in a district, regardless of the extent μ_i to which voters in the district "lean" to one party or the other.

However, spending promises will differ among districts. To see how, we assume for concreteness that voters evaluate spending promises relative to ideological concerns according to the utility function $u(x) = \log x$, so that $u'(x) = 1/x$. We then substitute $\Delta = 0$ into (5) and then sum over districts and use the budget constraint to eliminate the multiplier λ, yielding an expression the equilibrium spending promises:

$$\frac{x_i^*}{X} = \frac{1}{N_i}\frac{g_i(\mu_i)}{\sum_l g_l(\mu_l)} \tag{7}$$

[1] We assume there is sufficient concavity in the utility function u that the first-order conditions fully characterize an equilibrium.

Equation (7) shows how the distribution of spending among districts depends on relative values of the density $g_i(\mu_i)$ of the median voter's preferences at the point of indifference between the parties. Somewhat loosely, $g_i(\mu_i)$ measures the the proportion of "swing voters" in the riding, who are susceptible to marginal changes in parties' spending promises. To go further, assume additionally that G_i is single-peaked at $\nu = 0$. Then the qualitative implications of the model are:

1. x_i^* is decreasing in the absolute value of μ_i: districts known to lean to the right or left receive less than centrist districts.

2. Predictability of the local race has ambiguous effects on spending: a mean preserving spread in G_i causes spending to rise if μ_i is large in absolute value and causes spending to fall if μ_i is near zero. Thus, as all local races become more predictable, spending becomes more concentrated on districts where races are expected to be close.

3. Per capita spending is decreasing in district population: districts with small populations represent "cheap seats" that parties compete more intensively to win.

Of course, other factors, both political and economic, might be expected to influence the pattern of spending. For example, ... Our empirical analysis will include controls for a number of other factors, in addition to our measures of the closeness of local electoral races, described below.

3 Institutional Background

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 the agencies currently known as Atlantic Canada Opportunities Agency (ACOA, for the four Atlantic provinces[2]) 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

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

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. At present, there are 301 electoral constituencies represented in Parliament, 107 of them in the five provinces covered by our spending data.

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 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 parties have changed significantly. After winning majority governments in 1984 and 1988, the Progressive Conservative Party was reduced to two seats in 1993. The Liberal Party has since won three consecutive majorities in the elections of 1993, 1997, and 2000.

The 1993 election 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 et al., 1996). Whether or not that proves to be the case, electoral competition naturally continues in the current environment. While the Liberal Party seems likely to gain a plurality of seats in Parliament for the foreseeable future, its ability to form majority governments[3] and hence to govern effectively remains more in doubt. In the 1997 election, for example, the government's majority was five seats in the 301-seat Parliament. Likewise, despite the present strong regional diversity in party attachments, many individual constituencies remain competitive. With some important exceptions, the Liberal Party typically competes 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.

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

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 2000. We draw on four sources of information, described in detail below.

The data on regional development spending come from ACOA and CEDQ through a request from the Canadian Taxpayers' Federation. The raw data set records information on all spending commitments in the 1987/88 fiscal year through the 2000/01 fiscal year for ACOA, and the 1989/90 fiscal year through the 2000/01 fiscal year for CEDQ. Because our other data are on a calendar year basis, we restrict attention to the years 1988-2000 for ACOA and 1990-2000 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 postal codes. 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. Statistics Canada provides a file reporting the association of postal codes to federal electoral districts, which allows us to attach the recipients to the districts.

These procedures successfully matched more than 99 per cent of the 46,840 recorded individual grants to a federal electoral district. For our empirical analysis, we exclude payments to provincial government offices, and to province-wide business associations and 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. We also exclude recipients that reside in an electoral district outside the five provinces that are the target of the programs. This leaves a total of 41,448 individual grants that are linked to electoral districts used in our analysis. For each electoral district, we aggregate the total number of projects and total spending to arrive at the variables we use for our analysis.

The second source of data is electoral results, which were obtained from the Library of Parliament for the 1984, 1988, 1993, 1997, and 2000 elections. For each constituency and election year, we record the vote totals of each of the five parties that elected members to Parliament during this period. The voting data are then used to construct our measures of "swing" districts. For each district, we measure our MARGIN variable as the 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. We also use the voting data to estimate our predictive model of district elections, used to construct an estimated probability the government wins the district in the next election. The voting data were also linked to records of appointments to the federal Cabinet, also from Library of Parliament records to construct our CABINET variable at the district level.

The number and boundaries of electoral districts has differed from year to year over the sample period because of redistricting. Redistricting evidently creates problems in constructing a balanced panel of spending data, and also in correctly linking lagged values of electoral variables (vote shares and incumbent party) to each district. Redistricting occurs roughly every ten years, following the decennial census, and our data cover constituencies defined under each of the 1976, 1987, and 1996 Representation Orders. Our goal is to link districts under each of the three Representation Orders to construct a balanced panel. In most cases, the changes in riding boundaries following redistricting are minimal, and 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). In a small number of cases, a new district is created from small parts of several old ones, or an old district is divided among several new districts, and 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 2000. Note that the number of deletions is small: in the current, 1996 Representation Order, there are in total 107 districts in the target provinces.

The third source of data is the Canadian Census. Statistics Canada provides files for the Census at the federal electoral district level of aggregation. These files report district-level demographic and labour market characteristics such as population, education, income, and employment.

The final source of data are opinion polls on voting intentions conducted monthly by the Canadian Gallup Company during the 1988-2000 period. We record the poll results of the four parties (Liberals, Progressive Conservatives, New Democrats, and Bloc Quebecois) that elected members in the five provinces studied during the 1988-2000 period.[4] The results were aggregated to the regional level (i.e. Quebec and the Atlantic provinces separately) for each month in the sample period. Results for months in which federal elections were held are used in estimation of the predictive model of elections described in the Appendix. For non-election years, we calculate predicted values of the probability the governing party would win each district in each years, using the polling data for the month of April (the start of the government's fiscal year) and the estimated coefficients from the logit share equations. This is then used to construct estimates of the MARGPROB variable used in the spending regressions for each year of the sample.

Table 1 displays some statistics for the variables in our sample. The first column has the mean over the entire sample of 1173 observations. The next two columns break down the sample into the Atlantic Provinces (ACOA) and Quebec (CEDQ), We report the mean of each variable as well as the standard deviation in parentheses below.

The first two rows displays the measures of government spending. The first is ACOA/CEDQ spending per resident of the district, in year 2000 dollars (SPENDPC). On average, spending was \$57.26 per resident. There are great differences between ACOA and CEDQ, with spending per resident more than six times higher in ACOA provinces. Note that spending per capita is substantially lower in our sample than in the aggregate public accounts data reported above. This reflects the grants and constituencies excluded from our analysis, as well as differences in accounting conventions.

The second indicator of spending intensity is the number of projects per 100 thousand residents (PROJPC). This variable shows a similar disparity across the two agencies. The distribution of spending is highly skewed the top 20 percent of district-year observations account for 64 per cent of total spending. In our regressions below, we show results using a log transformation of spending per resident as the dependent variable to explore robustness to outliers.

The political variables are reported next. Around 53 per cent of constituencies in these provinces were held by members the governing party (GOVWIN), with a slightly higher share in the Atlantic provinces. Cabinet ministers held 13.1 per cent of constituencies in the five provinces we consider (CABINET). This proportion is very similar to the proportion in the country as a whole. The average margin of victory between the governing

[4]The polls asked respondents a standard question about "unprompted" voting intentions: "If a federal election were held today, which party's candidate do you think you would favour?"

party and the highest opposition party was 23.5 per cent on average (MARGIN). The races in the Atlantic provinces were much closer than those in Quebec, on average. Finally, our other measure of the closeness of the race is MARGPROB. This variable represents the estimated marginal increase in the probability of winning the seat with an increase in spending. Overall, the average value of MARGPROB is 0.329, with a slightly higher value in the Atlantic provinces than in Quebec.

The population is not equal across constituencies in a given year. The inequality arises both from differences across and within provinces. Across provinces, the district allocation formula favours smaller population provinces. Within provinces, relatively large (up to 25 per cent) deviations from the provincial average for district population are tolerated.

The final set of variables reports information on the economic and demographic makeup of the districts. The variables take sensible values. The 14.1 average for the unemployment rate is much higher than the overall Canadian average, but accurately reflects the relatively weak employment patterns in these provinces over this time period — especially in the Atlantic provinces.

5 Results

We present regression results featuring our two measures of closeness in a number of specifications. Both dollar levels of spending per resident and natural logarithms of spending per resident are reported. Results for ACOA and CEDQ appear separately, as we uncovered profound differences in the results for the two agencies.

The predicted signs on our two measures of closeness differ. The predicted coefficient on MARGIN is negative. The larger is MARGIN, the less close the previous election was in the district. If spending is attracted to close ridings, then we expect to see a negative relationship. In contrast, the expected sign on the coefficient on MARGPROB is positive. The model predicts that spending should be attracted to ridings where the greatest increment to the probability of winning can be found.

Table 2 contains the results with the ACOA provinces. The first two columns feature the MARGIN measure of closeness, and the last two feature the MARGPROB measure. In all regressions, we include a vector of demographic and economic characteristics of the district, along with provincial dummies and a dummy for each parliament.[5] The other variables are the

[5] Regressions including year dummies instead of parliament dummies showed similar results for MARGIN, but weaker results for MARGPROB. The explanation may lie in our as-

proportion of low income families, the log of median income, the local unemployment rate, the proportion with high school education, the proportion with some post-secondary, the proportion with a university degree, and the proportion in white-collar occupations. The results are not particularly sensitive to changes in the set of demographic and economic variables included.

In the first column, we present results on the levels of spending. The r-squared value indicates that our model explains about one third of the variation in the dependent variable. The estimated coefficient on MARGIN is -71.23, which is significant at the 10 per cent level. The economic magnitude of this coefficient, however, is not large. The coefficient implies that a 10 point decrease in MARGIN will lead to an increase in spending of $7.12, which is a 5.5 per cent increase on the average of SPENDPC in the Atlantic provinces.

Having a cabinet minister as a representative appears to have some influence on spending. The coefficient on CABINET suggests that these districts received $36.61 more per resident than other districts, or 28 per cent more than the average district. The coefficient is significant at the 10 per cent level. In contrast, we do not find evidence in favour of increased spending for government seats held by non-cabinet members. The estimated coefficient on GOVWIN is not statistically distinguishable from zero.

Finally, the coefficient on logarithm of population is negative, large, and strongly statistically significant. It implies that a 10 per cent increase in district population would lead to a $7.24 decrease in spending. This finding is consistent with the prediction of our model above, as 'cheap seats' carry the same electoral advantage but may be cheaper to influence. This finding is consistent with other work in political science by Ansolabehere et al. (2002), among others.

In the second column, we replace the dependent variable with its natural logarithm. The estimated coefficients for this specification therefore carry an easy interpretation as percentage changes in the dependent variable. The magnitudes of the estimated coefficients are comparable to the first column. For example, the coefficient on MARGIN implies that a 10 point decrease in MARGIN is associated with a 4.96 per cent increase in spending, compared to a 5.5 per cent decrease calculated at the mean for the first column.

The next two columns in Table 2 report the results using the MARGPROB measure of closeness. The estimated coefficient on MARGPROB is significant at $199.59. The positive sign is consistent with the prediction of

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sumptions about the speed of the response of spending to changes in voting preferences within an election cycle.

the model, as districts featuring a larger increment to the probability of winning attract more spending. The estimated magnitude of the effect is also large. A ten point increase in the marginal probability is associated with an approximate increase of $19.96, or 15 per cent of the average spending level in the Atlantic provinces. The other variables display a similar pattern to the first two columns of Table 2, although the coefficient on the CABINET variable slips beneath the ten percent level of significance.

In Table 3, we repeat the analysis for Quebec. As there are 105 cases in which a constituency did not receive any grants in a particular year, they are excluded from the log-transformed specifications.[6] The r-squared for the Quebec regressions is substantially smaller than for ACOA. As discussed above, the size of the program relative to the size of the population in Quebec is a fraction of the size in the Atlantic provinces. Since the spending is smaller, politicians may not find it an effective channel for influencing voters. This may explain the difference in fit.

We estimate a positive coefficient on MARGIN for Quebec in the first two columns of the table. This estimate indicates that spending is concentrated in districts that were not close in the previous election. We again find some influence of cabinet members, but the negative coefficients on GOVWIN indicate spending is concentrated in ridings that were previously lost. The population coefficient is again negative, which is consistent with our theory and the ACOA results. The results on MARGPROB in the last two columns indicate no evidence of a relationship between this measure of closeness and CEDQ spending.

To summarize, we find strong evidence in favour of the hypothesis that spending is targeted to close races in ACOA, but not for CEDQ in Quebec. In addition, there is some evidence that districts represented by cabinet ministers attract more spending. Finally, our estimates indicate strong support for the prediction that spending will be targeted at 'cheap seats.'

6 Conclusion

Our results for Atlantic Canada show clear support for the view that transfers are used to influence electoral outcomes. Spending is greater in swing districts than those that show strong attachment to either government or opposition parties. Moreover, while there is no evidence that districts returning a government member to Parliament are favoured by the spending

[6]This exclusion is worth further study, as regressions (not shown here) on a binary variable indicating the presence of at least one project indicate that they are systematically different from districts with projects.

allocation, those represented by members of the federal Cabinet are.

It remains puzzling, however, that the pattern of spending in Quebec appears so different. This may simply reflect the different scale of the program there: per capita incomes and industrial development are generally greater in Quebec than the Atlantic region, and transfers per capita from the development agency correspondingly smaller. Thus politicians may not perceive the transfers as an important lever to influence elections. As well, the nature of political competition differs markedly between the two regions. Since 1993, competition in Quebec electoral districts has been mainly between the governing Liberal party and the secessionist Bloc Quebecois, which runs regionally and has no chance of forming a national government. Over the same period, federal political strategy is Quebec has been focussed on a pair of province-wide referenda on constitutional issues, as well as on traditional partisan politics. The role of such considerations appears a fruitful avenue for future research.

A Appendix: A predictive model of elections

For our empirical work, we require proxy measures of the "closeness" of the race in each electoral district, as perceived by the government party, which is predicted to influence he pattern of spending across districts in each year. Our simplest proxy for closeness is MARGIN, the percentage vote difference between the government party and the best of the opposition parties in the district at the preceding election. An alternative approach, that may better capture the persistent tendencies of ridings to "swing" between parties and the information available to parties at the time spending decisions are made, is to estimate a predictive model of voting at the district level. This appendix describes our approach to doing so, which is used to construct the alternative proxy for closeness, MARGPROB, used in the spending regressions.

Our goal is a simple model of voting behaviour that reflects the fact that a number of constituencies in Canada are often "three-way races" among parties, and that four different parties returned members from constituencies in the provinces we study. We therefore estimate a multinomial logit of voter choice. In what follows, we describe how voter choice probabilities are estimated, and how the resulting estimates can be used to construct consistent estimates of the probability the government party wins the constituency in the next election.

In each electoral district $i = 1, \ldots, M$, there are J parties standing for election, and a continuum of voters. Omitting the district index i for now, a representative voter derives utility

$$U_j = \mu_j + \nu_j + \epsilon_j \tag{A1}$$

from voting for party $j = 1, \ldots, J$, where μ is non-stochastic "mean" preference for the party, ν is a common shock (the same for all voters in the riding), and ϵ is an iid shock for individual voters in the riding. Assume that ϵ_j is distributed extreme value with mean 0 and variance 1 ($\epsilon_j \sim EV(0,1)$), iid for all parties and voters in the riding. Assume that $\nu_j \sim EV(0, \sigma^2)$, iid across parties in the riding, but the common to all voters.

In what follows we make use (twice) of the following result: if $u_j \sim EV(0, \sigma^2)$ then

$$\text{Prob}(z_j + u_j \geq \max_k \{z_k + u_k\} | z_1, \ldots, z_J) = \frac{e^{z_j/\sigma}}{\sum_k e^{z_k/\sigma}} \tag{A2}$$

Using (A2) and the law of large numbers, the vote shares of each party conditional on the common shocks are

$$\begin{aligned} s_j(\nu) &= \text{Prob}(\mu_j + \nu_j + \epsilon_j \geq \max_k \mu_k + \nu_k + \epsilon_k | \nu) \\ &= \frac{e^{\mu_j + \nu_j}}{\sum_k e^{\mu_k + \nu_k}} \end{aligned} \tag{A3}$$

To estimate (A3), we replace the mean preference for each party by a linear function of observables, $\mu_{ij} = x'_{ij}\beta + z'_i\gamma_j$ for party j in district i, where x_{ij} are characteristics of the parties relevant to district i, and z_i are characteristics of the district. Taking logs in (A3) and normalizing $\nu_1 = 0$ without loss of generality, we have estimating equations

$$\log(s_{ij}/s_{i1}) = (x_{ij} - x_{i1})'\beta + z'_i(\gamma_j - \gamma_1) + \nu_j \qquad j = 2, \ldots, J \tag{A4}$$

which is to be estimated using data on party vote shares to recover estimates of β, γ, and $\sigma^2 = \text{Var}(\nu_{ij})$.

Given estimates of the parameters, the probability each party wins the race in district,

$$\pi_{ij} = \text{Prob}(s_{ij}(\nu) \geq \max_k s_{ik}(\nu))$$

Note that, for any k, $s_{ij} \geq s_{ik}$ if and only if

$$\log(s_{ij}/s_{ik}) = (\mu_{ij} + \nu_{ij}) - (\mu_{ik} + \nu_{ik}) \geq 0$$

Applying (A2) once again,

$$\pi_{ij}(\mu_i, \sigma) = \text{Prob}(\mu_{ij} + \nu_{ij} \geq \max_k \mu_{ik} + \nu_{ik}) = \frac{e^{\mu_{ij}/\sigma}}{\sum_k e^{\mu_{ik}/\sigma}} \tag{A5}$$

Consistent estimates of $\hat{\pi}_{ij}$ can therefore be calculated by substituting fitted values of μ_{ij} and the estimated σ into (A5). Finally, we recover our proxy for the predicted closeness of the race by calculating the derivative of the probability the government party (say, party 1) wins the district with respect to the mean preference μ_{i1}. Differentiating (A5),

$$\text{MARGPROB}_i = \frac{\partial \pi_{i1}}{\partial \mu_{i1}} = \frac{\hat{\pi}_{i1}(1 - \hat{\pi}_{i1})}{\sigma} \tag{A6}$$

A.1 Estimates

Table A.1 presents estimates of the logit vote share equations using data from the 1988, 1993, 1997, and 2000 elections. We pool data across elections but, since electoral competition appears to be very different in Quebec than in the Atlantic provinces, we estimate the model separately for the two regions. In both regions, the base category (party 1 in equation (A4)) is the Liberal Party. Therefore, estimated coefficients should be interpreted as indicating how each independent variable influences the vote share of the other parties relative to the Liberal Party.

The dependent variable is the vote share of each of the three parties that won seats in these regions during these elections (these are the Liberal and Progressive Conservatives parties in both regions, the Bloc Quebecois in Quebec, and the New Democratic Party in the Atlantic region). The independent variables are as follows. For party characteristics, we use: the log of the party's share of decided voters in opinion polls conducted during the month preceding the election, aggregated to the region level (LPOLL) and also at the national level (LNATPOLL); a dummy variable equal to one if the party's candidate is the incumbent Member of Parliament for the constituency (INC); and a dummy variable equal to one if the party won the constituency during the previous general election (INCP). For district characteristics, we use: the unemployment rate (UERATE); the proportion of families with incomes below the "low-income cutoff" poverty threshold (LOWINC); the median family income (MEDINC); the proportion of workers in professional, administrative, and clerical occupations (WHITECOL); the proportion of families who rent their homes (RENT); the proportion married (MARRIED); the proportion whose first language is French (FRENCH); and the proportion who are immigrants to Canada (IMMIGRANT).

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Table 1: Descriptive Statistics

	Full sample	1988-1993	1994-2000
Observations	1121	677	444
Spending per person	60.39	59.59	61.61
	(84.96)	(79.89)	(92.23)
Projects per 100K persons	53.14	46.71	62.94
	(92.31)	(85.09)	(101.66)
Government won	0.518	0.419	0.669
	(0.500)	(0.494)	(0.471)
Government margin	0.235	0.252	0.210
	(0.168)	(0.172)	(0.159)
Has a cabinet minister	0.131	0.136	0.124
	(0.338)	(0.343)	(0.330)
log of population	86440	87525	84785
	(21,618)	(21,057)	(22,368)
Proportion of low income families	0.171	0.183	0.153
	(0.064)	(0.067)	(0.055)
Log of median family income	46755	45732	48315
	(7698)	(7,498)	(7,744)
Unemployment rate	0.141	0.139	0.144
	(0.059)	(0.056)	(0.062)
Proportion with high school	0.198	0.199	0.195
	(0.047)	(0.048)	(0.047)
Proportion with post-secondary	0.299	0.306	0.289
	(0.047)	(0.044)	(0.048)
Proportion with university degree	0.103	0.110	0.093
	(0.065)	(0.068)	(0.059)
Proportion white-collar	0.694	0.708	0.671
	(0.105)	(0.105)	(0.102)

Reported are the means and standard deviations for each variable.

Table 2: ACOA - Atlantic Results

	Closeness Measure			
	MARGIN		MARGPROB	
Dependent variable:	SPENDPC	log (SPENDPC)	SPENDPC	log (SPENDPC
# obs	403	403	403	403
R-squared	0.333	0.327	0.310	0.345
GOVWIN	4.58 (12.22)	0.014 (0.087)	-8.43 (12.60)	-0.107 (0.088)
MARGIN	-71.23 * (38.05)	-0.496 ** (0.239)	--	--
MARGPROB	--	--	199.59 ** (60.80)	1.823 ** (0.474)
CABINET	36.61 * (20.98)	0.186 * (0.112)	31.72 (19.95)	0.157 (0.109)
log (POP)	-72.42 ** (23.88)	-0.691 ** (0.180)	-64.04 ** (22.47)	-0.633 ** (0.172)
Parliament effects	yes	yes	yes	yes
prov effects	yes	yes	yes	yes
Income / education / UE controls	yes	yes	yes	yes

Notes: Variable construction described in text.
Significance at the 10% level is indicated with a single asterisk. Two asterisks indicates significance at the 5% level.
Spending is measured in 2000 Canadian dollars.
Reported are robust standard errors.

Table 3: CEDQ - Quebec Results

	Closeness Measure			
	MARGIN		MARGPROB	
Dependent variable:	SPENDPC	log (SPENDPC)	SPENDPC	log (SPENDPC
# obs	770	665	770	665
R-squared	0.100	0.116	0.904	0.108
GOVWIN	-4.10	-0.246 *	-3.61	-0.224
	(3.11)	(0.144)	(3.23)	(0.146)
MARGIN	24.15 **	0.899 **	--	--
	(7.57)	(0.382)		
MARGPROB	--	--	-2.45	0.033
			(8.60)	(0.495)
CABINET	6.75	0.284 *	8.07 *	0.347 *
	(4.42)	(0.198)	(4.56)	(0.192)
log (POP)	-7.73	-0.802 **	-8.66	-0.830 **
	(10.68)	(0.386)	(10.75)	(0.382)
Parliament effects	yes	yes	yes	yes
prov effects	yes	yes	yes	yes
Income / education / UE controls	yes	yes	yes	yes

Notes: Variable construction described in text.
Significance at the 10% level is indicated with a single asterisk. Two asterisks indicates significance at the 5% level.
Spending is measured in 2000 Canadian dollars.
Reported are robust standard errors.

Table 4: Estimates of log vote share equations

	Atlantic Region		Quebec	
	Coefficient	Standard Error	Coefficient	Standard Error
Party Characteristics				
LPOLL	·70**	·12	·73**	·17
LNATPOLL	·11	·15	·65**	·2
INC	·19**	·06	·21**	·05
INCP	−·06	·12	−·01	·04
District Characteristics: Progressive Conservative Party				
UERATE	−7·40**	1·85	−2·57	2·93
LOWINC	·10*	·05	·01**	·00
MEDINC	·39	·46	·17	·72
WHITECOL	−2·24*	·72	·15	·76
RENT	−1·25	3·50	−4·95**	1·49
MARRIED	4·7**	2·22	−7·64**	2·10
FRENCH	−·29	·26	1·09**	·39
IMMIGRANT	6·07	5·43	·12	·69
District Characteristics: Third Party[a]				
UERATE	−3·07	1·81	1·46**	·57
LOWINC	·10**	·01	−·00	·01
MEDINC	·64	·41	·34	·29
WHITECOL	1·34**	·42	−·44**	·11
RENT	−7·12**	2·86	·60	2·17
MARRIED	−2·9	2·13	−1·74	3·06
FRENCH	·10**	·04	3·73**	·45
IMMIGRANT	19·1**	5·70	1·47**	·39

Notes: All specifications include year and municipality fixed effects. Standard errors are robust standard errors, clustered by year.

[a]Third party is New Democratic Party in Atlantic and Bloc Quebecois in Quebec.

*: Significant at the ten per cent level.

**: Significant at the five per cent level.