The Canada economic action plan as electoral tool

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Abstract

This paper models the optimal distribution of government spending when the electoral benefit does not accrue to the party in power but to the incumbent of the district which received the spending. The model shows that, under certain parametres, more money is spent in core support districts. To verify this claim empirically, I first study the distribution of projects undertaken in the scope of the 2009-2011 Canada Economic Action Plan, and find that districts supporting the party in power received more projects than opposition districts controlling for socio-economic characteristics of electoral districts and those of its representative in Parliament. Second, taking into account the missing variable bias, I provide evidence for the fact that government spending played a positive role in the reelection of the district incumbent party in the 2011 elections.

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1 Introduction

All models explaining the distribution of discretionary government spending start with the premiss that the party in power can take credit for spending in the constituency and conclude either that core districts (Cox and McCubbins, 1986) or swing districts (Lindbeck & Weibull, 1987) are favoured. Contrary to this previous literature, the model developped in this paper explains government spending assuming that credit is given only to the incumbent of the district where the funds were spent. This electoral benefit to the incumbent could come from two channels. First, district representatives could actively contribute to the allocation of spending. They could, for example, lobby key civil servants or help project proponents through the red tape. In that sense, credit from their constituents would be duly earned. Second, one could posit that most voters know little about the allocation process. Such voters could over-estimate the role played by their representative, and give them unduly credit. Litschig and Morrison (2011) show, for example, that regional incumbents have a greater probability of reelection when their district receives more transfers from the central government. These incumbents receive the electoral benefit even though they played no role in determining the transfer. It is unclear which of the two channels is the stronger one, but it is realistic to assume that the incumbent receives some electoral benefit from the spending. Using this assumption, I find parametres under which the party in power would favour core or swing districts. To test the assumptions and the predictions of this model, I use the distribution of projects undertaken in the scope of the Canada Economic Action Plan 2009-2011: $42 billion invested in 15 000 infrastructure projects across Canada.

In the last 20 years, much empirical research has tested whether core or swing districts benefit from the allocation of pork barrel. Levitt & Snyder (1995), for example, find that Democratic control of Congress led to more intergovernmental transfers to democratic districts between 1984 and 1990, and Ansolabehere & Snyder (2006) come to the same conclusion. Denemark (2000), however, shows that the allocation of recreational projects in Australia was biased towards swing districts, just like Swedish ecological projects (Dahlberg & Johansson, 2002). This paper finds support for the core district hypothesis: the most money went towards districts strongly supporting the party in power, less money was invested in swing districts, and the least money was given to opposition districts.

In spite of the fact that the theoretical literature uses reelection as the motivation for pork barrel spending, there is surprisingly very little empirical

research connecting spending with subsequent election results. Both Alvarez & Saving (1997) and Samuels (2002) attempt this analysis. However, by not taking into account a possible missing variable bias affecting both spending and reelection, their results offer little guidance. Snyder & Levitt (1997) study the impact ofgovernment spending on the share of votes for the party in power in the district using valid instruments and find a positive correlation between spending and the share of votes. Finally, Litschig and Morrison (2011) use a regression discontinuity design to study whether the transfer from the central government have an impact on the reelection of the incumbent in the regional government. This paper also analyzes the impact of spending on the reelection of the district incumbent but using instrumental variable strategy. To address the issue of the missing variable bias, I use a dummy variable indicating whether the district was in the downtown of a major city as instrument. Using this strategy, I find that district incumbents receive electoral benefits for the projects undertaken in their district. This evidence supports the key assumption of the model.

This paper is the first to build a model explaining the optimal distribution of discretionary government spending by the party in power assuming that only the district incumbent receives the electoral benefit. Furthermore, it also contributes to a burgeoning empirical literature linking government spending to the electoral success of the incumbent. The rest of the paper is divided into the following sections. First, I build a model. I, then, describe the data and estimation strategy. Third, I present and discuss the results of the regression analysis. Finally, I conclude and present further research avenues.

2 Model

The party in power allocates spending to maximize its electoral sucess. In Lindbeck & Weibull (1987), such a strategy means investing heavily in districts without a strong political allegiance (ie swing districts) to sway the vote towards the party in power. However, when the electoral benefit goes only to the incumbent and the completion of projects is random, investments in such districts are very risky. These districts are very responsive to government spending, but they could easily change hands before the project is actually started. In such a case, an incumbent from the opposition party would benefit from the spending. Investing in such districts has the potential for a great return, but also a great loss. The trade-off between risk and

return is at the heart of the model.

Before studying further the behaviour of parties, let's first consider the behaviour of voters. They have a utility function over political platform (pp_l) and money spent in their district (B_k). I assume that: $\frac{\partial U_{lk}}{\partial B_k} > 0$ and that B_k is the same for all voters of district "k". Citizens will vote for the district incumbent if their utility is greater than a certain threshold: $u_{lk}(pp_l, B_k) > U_{lk}$.

The party in power cannot modify its political platform to sway the vote. It can only allocate funds to the electoral districts in T_0 to maximize the probability of its candidate to win the election. Each district receives one project, which is completed at a random date. This randomness could be attributed to unforeseen problems or exogenous decisions taken by civil servants mandated to complete the projects. Credit for the project accrues only to the district incumbent and only to the district incumbent in place when the project is completed. Following the allocation decision, there are two elections. The first one can take place before (with probability π) or after the completion of the project (with probability $1 - \pi$) in a given district. The second one takes place after the completion of the projects. Figure 1 illustrates the timeline.

(Figure 1)

The party in power maximizes the probability that the district elects its candidate in the first (E_k^1) and second elections (E_k^2) by allocating pork B_k to district "k". The more money a district receives, the greater is the probability that the district reelects the incumbent but at a decreasing rate ($\frac{\partial E_k}{\partial B_k} > 0$ and $\frac{\partial^2 E_k}{\partial B_k^2} < 0$). The total value of projects must satisfy the exogenous budget condition (B):

$$\max_{B_k} \; E_k^1 + E_k^2 \tag{1}$$

subject to:

$$\sum_{k=1}^{k=n} B_k = B \tag{2}$$

The marginal impact of one dollar of spending in a given district is therefore:

$$\pi \frac{\partial E_k^1}{\partial B_k}|_k + (1-\pi)\mathbb{E}\left[\frac{\partial E_k^2}{\partial B_k}|_k\right] \tag{3}$$

The first expression is the impact of the spending on the probability of winning the first election for the party in power if the project takes place before the first election. This impact will depend on the status of the district. If the incumbent is from the party in power, for example, the expression will be positive. Otherwise, it will be negative. Furthermore, the absolute magnitude of the impact will also depend on the district. If, for example, the party in power won the district by a large margin in the previous election, and is very confident to win again, the impact of spending will be positive but small. The second expression represents the expected impact of the pork on the second election if the project is completed after the first election. This impact will depend on the district and on the result of the first election. A district in the hands of the party in power before the first election could now be in the hands of the opposition for example. To simplify the model, I abstract from the impact of winning the first election on winning the second election in line with the well-documented incumbency effect (Lee, 2001).

To maximize the return of spending, the party in power will want to equalize its marginal impact across districts. If spending has a great impact in a district, it will receive more money until its decreasing marginal contribution equates the marginal benefit across districts.

The literature generally distinguishes between two types of districts: core and swing districts. Core districts have an established political allegiance, while swing districts are more easily influenced. Because the electoral effect accrues to the incumbent, it is necessary to be more specific about the types to capture who is incumbent. This model divides the districts into four types: core opposition (co), swing opposition (so), swing party in power (spp) and core party in power (cpp). I can now compare the marginal impact of spending in these four types of districts and infer the amount of spending in each type. Equation (3) can now be written explicitely to account for these four types. To do so, I introduce $P^{i \to j}$ which is the probability of transitioning from type "i" to type "j" during the first election. The marginal impact of spending in district "i" is therefore:

$$\pi \frac{\partial E_i^1}{\partial B_i}|_i + (1-\pi)\left(P_i^{i \to co} \cdot \frac{\partial E_i^2}{\partial B_i}|_{co} + P^{i \to so}\frac{\partial E_i^2}{\partial B_i}|_{so} + P^{i \to spp}\frac{\partial E_i^2}{\partial B_i}|_{spp} + P^{i \to cpp}\frac{\partial E_i^2}{\partial B_i}|_{cpp}\right) \tag{4}$$

The objective of the next section is to establish conditions under which the different types of districts will receive more or less spending. Before establishing these conditions, it is necessary to differentiate swing and core districts using the following six assumptions:

Assumption 1(symmetry 1): $P^{a \to b} = P^{b \to a}$ where "a" and "b" are types of districts.

The probabilities are symmetric. This assumption means that a district has the same probability to go, for example, from an opposition swing district to a party in power swing district as the one to go from a party in power swing district to an opposition swing district. This assumption is unrealistic if one party is gaining in popularity.

Assumption 2 (symmetry 2): $\frac{\partial E_i}{\partial B_i}|_{co} = -\frac{\partial E_i}{\partial B_i}|_{cpp}$ and $\frac{\partial E_i}{\partial B_i}|_{so} = -\frac{\partial E_i}{\partial B_i}|_{spp}$

The absolute value of the marginal impact of both core districts and both swing districts are equal.

Assumption 3 (similarity): $\frac{\partial E_i^1}{\partial B_i}|_k = \frac{\partial E_i^2}{\partial B_i}|_k$

For a given type of district, the impact of pork is the same in the first and second elections:

Assumption 4 (proximity): $P^{so \to co} > P^{so \to cpp}$ and $P^{spp \to cpp} > P^{spp \to co}$.

It is more probable for a swing opposition district to become a core opposition district for the second election than to become a core party in power district. Similarly, it is more probable for a swing party in power district to become a core party in power district than to become an core opposition district.

Assumption 5 (inertia): $P^{cpp \to cpp} > P^{spp \to spp}$ and $P^{co \to co} > P^{so \to so}$

The probability that a core district keeps the same type is greater than the probability that a swing district keeps the same type.

Assumption 6 (responsiveness): $\frac{\partial E_i}{\partial B_i}|_{spp} > \frac{\partial E_i}{\partial B_i}|_{cpp}$

Spending has a greater impact in swing districts than in core districts.

Assumption 2 already allows a simplification from equation (4) to compare the marginal impact of spending in different types of districts. Spending has a greater marginal impact in district of type "k" than district of type "l" and will therefore receive more pork if:

$$\pi\left(\frac{\partial E_i^1}{\partial B_i}|_k - \frac{\partial E_i^1}{\partial B_i}|_l\right) + (1-\pi)\left(P^{l\to co} + P^{k\to cpp} - (P^{k\to co} + P^{l\to cpp})\right)\frac{\partial E_i^2}{\partial B_i}|_{cpp}$$
$$+(1-\pi)\left(P^{l\to so} + P^{k\to spp} - (P^{k\to so} + P^{l\to spp})\right)\frac{\partial E_i^2}{\partial B_i}|_{spp} > 0 \quad (5)$$

Using the previous assumptions, it is now possible to prove the first proposition:

Proposition 1: If π is small enough, spending in core party in power districts (k=cpp) will have a greater marginal impact than in swing party in power districts (l=spp). A maximizing party would therefore spend more in core party in power districts.

Proof: Using the fact that $\frac{\partial E_i^1}{\partial B_i}|_k$ is now $\frac{\partial E_i^1}{\partial B_i}|_{cpp}$ and assumption 3, I can distribute the first term in the second and third terms:

$$\left((1-\pi)\left(P^{spp\to co} + P^{cpp\to cpp} - (P^{cpp\to co} + P^{spp\to cpp})\right) + \pi\right)\frac{\partial E_i^2}{\partial B_i}|_{cpp}$$
$$+\left((1-\pi)\left(P^{spp\to so} + P^{cpp\to spp} - (P^{cpp\to so} + P^{spp\to spp})\right) - \pi\right)\frac{\partial E_i^2}{\partial B_i}|_{spp} > 0 \quad (6)$$
$$\left((1-\pi)\left(P^{spp\to co} + P^{cpp\to cpp} - (P^{cpp\to co} + P^{spp\to cpp})\right) + \pi\right)\frac{\partial E_i^2}{\partial B_i}|_{cpp} >$$
$$\left(\pi - (1-\pi)\left(P^{spp\to so} + P^{cpp\to spp} - (P^{cpp\to so} + P^{spp\to spp})\right)\right)\frac{\partial E_i^2}{\partial B_i}|_{spp} \quad (7)$$

Without loss of generality, let's assume that:[2]

$$\left(\pi - (1-\pi)\left(P^{spp\to so} + P^{cpp\to spp} - (P^{cpp\to so} + P^{spp\to spp})\right)\right) > 0. \quad (8)$$

It is therefore possible to express the ratio of the probabilities as an upper bound for the ratio of the marginal impacts of spending on the result of one election for the two types of districts:

[2]if the term is negative, the ratio of the two partial derivatives is no longer bounded, which would also prove the proposition

$$\frac{(1-\pi)\left(P^{spp\to co}+P^{cpp\to cpp}-\left(P^{cpp\to co}+P^{spp\to cpp}\right)\right)+\pi}{\pi-(1-\pi)\left(P^{spp\to so}+P^{cpp\to spp}-\left(P^{cpp\to so}+P^{spp\to spp}\right)\right)}>\frac{\frac{\partial E_i^2}{\partial B_i}|_{spp}}{\frac{\partial E_i^2}{\partial B_i}|_{cpp}} \quad (9)$$

From assumption 6, we know that: $\frac{\frac{\partial E_i^2}{\partial B_i}|_{spp}}{\frac{\partial E_i^2}{\partial B_i}|_{cpp}} > 1$, which means that at least:

$$\frac{(1-\pi)\left(P^{spp\to co}+P^{cpp\to cpp}-\left(P^{cpp\to co}+P^{spp\to cpp}\right)\right)+\pi}{\pi-(1-\pi)\left(P^{spp\to so}+P^{cpp\to spp}-\left(P^{cpp\to so}+P^{spp\to spp}\right)\right)}>1 \quad (10)$$

$$P^{spp\to co}+P^{cpp\to cpp}-\left(P^{cpp\to co}+P^{spp\to cpp}\right)$$
$$+P^{spp\to so}+P^{cpp\to spp}-\left(P^{cpp\to so}+P^{spp\to spp}\right)>0 \quad (11)$$

The left hand side can be regrouped as a sum of four terms:

$$\left(P^{spp\to co}-P^{cpp\to co}\right)+\left(P^{spp\to so}-P^{cpp\to so}\right)$$
$$+\left(P^{cpp\to cpp}-P^{spp\to spp}\right)+\left(P^{cpp\to spp}-P^{spp\to cpp}\right)>0 \quad (12)$$

Due to assumption 4, the first and second assumptions are positive. Assumption 6 makes the third term positive, and assumption 1 makes the last term equal 0. In that sense, the expression is necessarily positive, and could therefore be greater than $\frac{1}{1-\pi}$ if π is small enough. QED

The intuition for this result is that the risk that the party-in-power inadvertently helps the incumbent in a swing opposition district is greater in swing party in power districts than in core party in power districts. This risk increases as π becomes smaller. In an extreme case where $\pi = 1$, there is a probability zero that spending in a swing party in power district will help an opposition incumbent. In such a case, more spending would go towards swing party in power districts.

Proposition 2: If π is small enough, the marginal benefit of pork in swing opposition district is greater than it is in core opposition districts.

Proof:

$$\pi\left(\frac{\partial E_i^1}{\partial B_i}|_{so}-\frac{\partial E_i^1}{\partial B_i}|_{co}\right)+(1-\pi)\left(P^{co\to co}+P^{so\to cpp}-\left(P^{so\to co}+P^{co\to cpp}\right)\right)\frac{\partial E_i^2}{\partial B_i}|_{cpp}$$
$$+(1-\pi)\left(P^{co\to so}+P^{so\to spp}-\left(P^{so\to so}+P^{co\to spp}\right)\right)\frac{\partial E_i^2}{\partial B_i}|_{spp}>0 \quad (13)$$

Using assumptions 2 and 3, we can substitute $\frac{\partial E_i^1}{\partial B_i}|_{so} - \frac{\partial E_i^1}{\partial B_i}|_{co}$ by $\frac{\partial E_i^2}{\partial B_i}|_{cpp} - \frac{\partial E_i^2}{\partial B_i}|_{spp}$ and rearrange to get:

$$\begin{aligned}&((1-\pi)(P^{co\to co} + P^{so\to cpp} - (P^{so\to co} + P^{co\to cpp})) + \pi)\,\frac{\partial E_i^2}{\partial B_i}|_{cpp} > \\ &(-(1-\pi)(P^{co\to so} + P^{so\to spp} - (P^{so\to so} + P^{co\to spp})) + \pi)\,\frac{\partial E_i^2}{\partial B_i}|_{spp} \qquad (14)\end{aligned}$$

which can be rewritten as:

$$\frac{((1-\pi)(P^{co\to co} + P^{so\to cpp} - (P^{so\to co} + P^{co\to cpp})) + \pi)}{(-(1-\pi)(P^{co\to so} + P^{so\to spp} - (P^{so\to so} + P^{co\to spp})) + \pi)} > \frac{\frac{\partial E_i^2}{\partial B_i}|_{spp}}{\frac{\partial E_i^2}{\partial B_i}|_{cpp}} \qquad (15)$$

Since $\frac{\frac{\partial E_i^2}{\partial B_i}|_{spp}}{\frac{\partial E_i^2}{\partial B_i}|_{cpp}} > 1$, the left-hand side expression must also be strictly greater than zero for this condition to be met:

$$\frac{((1-\pi)(P^{co\to co} + P^{so\to cpp} - (P^{so\to co} + P^{co\to cpp})) + \pi)}{(-(1-\pi)(P^{co\to so} + P^{so\to spp} - (P^{so\to so} + P^{co\to spp})) + \pi)} > 1 \qquad (16)$$

$$P^{co\to co} + P^{so\to cpp} - P^{so\to co} - P^{co\to cpp} + P^{co\to so} + P^{so\to spp} - P^{so\to so} - P^{co\to spp} > 0 \qquad (17)$$

$$P^{co\to co} + P^{so\to cpp} - P^{so\to co} - P^{co\to cpp} + P^{co\to so} + P^{so\to spp} - P^{so\to so} - P^{co\to spp})) > 0 \qquad (18)$$

$$(P^{co\to co} - P^{so\to so}) + (P^{so\to cpp} - P^{co\to cpp}) + (P^{co\to so} - P^{so\to co}) + (P^{so\to cpp} - P^{co\to cpp}) > 0 \qquad (19)$$

From assumption 6, the first term is positive. From assumption 4, the second and fourth term are positive. From assumption 1, the third term is zero. The whole expression is therefore positive, and the inegality (15) is possible. QED

If π is small enough, the distribution of spending corresponds to the predictions of the core district hypothesis: $B_{co} \leq B_{so}$ and $B_{spp} \leq B_{cpp}$. If π is large, the distribution resembles the predictions of the swing district hypothesis, only that $B_{co} = B_{so} = 0$. In the extreme case where $\pi = 1$, any pork going to opposition districts would necessarily hurt the candidate from the party in power. There would therefore be no spending in opposition districts.

2.1 Numerical Example

The last two propositions establish that it is possible for core party in power districts to receive more pork than swing party in power districts if π is small enough. Using a transition matrix which meets the previous assumptions (see table 1), I find how small π has to be for plausible parametres to lead to this conclusion. Taking those transition probabilities and using equation (9), I build table 2 which shows the upper bound for $\frac{\frac{\partial E}{\partial B}|_{spp}}{\frac{\partial E}{\partial B}|_{cpp}}$ which supports an allocation to core districts. It would be plausible for $\frac{\frac{\partial E}{\partial B}|_{spp}}{\frac{\partial E}{\partial B}|_{cpp}}$ to be at or above 1.6, which would mean that if $\pi < 0.4$, one would expect core districts to receive more projects.

(Table 2 here)

(Table 3 here)

3 Data and Estimation Strategy

3.1 Data

Before discussing in detail the methodology used to verify the model, it is important to describe the Economic Action Plan (EAP) in more detail. This plan is a very general term used to frame government budgets following the 2008 financial crisis. The purpose of these budgets was to stimulate the Canadian economy through increased government spending. This paper focuses on the infrastructure projects introduced in the EAP. The provision for these projects existed only in the 2009 and 2010 budgets, and they should have been completed by the end of 2011. About 15 000 such projects were financed through the EAP for a total value of $42 billion. Examples of projects include: road resurfacing, sewage water plant improvements, social housing renovations, improvements to arenas, purchase of new equipment for businesses, renovations to federal buildings etc.

The first step in the allocation procedure was to create and endow approximately 30 iniatives which address certain infrastructure needs. Examples of initiatives include: housing for low-income seniors, northern housing, cleaning-up contaminated sites, knowledge infrastructure program, national historic sites of Canada etc. These initiatives were then given to departments according to their specialties.

The second step was to choose the specific projects to be funded. An important criteria for the approval of all projects was "shovel-readiness", meaning that projects could start once the funds had been approved. All departments were responsible to establishing further criteria and allocating the funds. In some cases, money was given to provinces who chose the projects, while in other ones, municipalities or NGOs applied directly for federal funding. In most cases, the federal government only funded a percentage of the total cost of the project. On average, the federal government covered 40 percent of the cost. Due to the application and cost-sharing mechanisms, the amount invested in an electoral district is not completely determined by the federal government.

Finally, once a project was approved, this information was publicized on the website of the EAP [3] and a large poster was erected on the site of the project. These posters (see figure X for an example) stated the purpose of the project, the fact that it was funded through the EAP and a maple leaf to signal that the funding was from the federal government. These measures provided much publicity to these projects and for the EAP in general.

In May 2011, when all probjects had been approved and publicized, I started collecting data on the EAP. I first summed the federal/total amount spent and the number of projects undertaken in each of the 308 electoral districts. Second, I gathered information on party allegiance across districts. Parties presented candidates in each electoral district for the 2008 election, and the candidate who received the most votes in the district was chosen as Member of Parliament (MP) for that district. These elections preceded the EAP and brought the Conservative Party of Canada (CPC) to Parliament as a minority government with 142 MPs. For every district, I gathered information on the share of the votes for each of the four main parties and on the party of the winning candidate. The 2011 election followed the distribution and completion of projects. To determine the impact of spending on reelection, I collected information on the reelection of incumbent parties by district and the share of the vote of the 2008 incumbent. Third, I incorporate information on the MP representating the district between 2008 and 2011 (39th legislature). The experience and the previous positions MP could play a role in the distribution of projects, and could possibly play a role in the reelection of the MP.

[3] http://actionplan.gc.ca/eng/map.asp and http://www.spatialdatabox.com/map-demos/canada-economic-action-plan-map.html

Finally, I used per district data from the 2006 census to control for socio-economic differences between districts. This data includes the population of the district [4], the share of the population aged 19 and below, the share of the population aged 65 and above, the median income of a family, the share of the immigrant population, the share of the aboriginal population, the unemployment rate, whether the district was downtown, whether the district was in the North, and whether the district was in the National Capital Region. These explanatory variables should capture some of the needs of districts for infrastructure.

Using this unique dataset, I can verify the model presented in the previous section. First, I study the allocation of projects by electoral district to determine if swing or core districts were favoured. Second, to provide an empirical basis for the key assumption of the model I estimate whether the number and total value of projects had a positive impact on the incumbent's reelection in 2011 and the change of his/her vote share between the 2008 and 2011 elections.

3.2 Impact of Political Allegiance on the Distribution of Projects: Core or Swing?

The model predicts an allocation to core or swing districts depending on the value of π, the probability that the projects are completed before the first election. As much as it is impossible to know the value of π, it is important to know that the party in power in 2009 formed a minority government that could have been defeated at any time. If such an event had happened, new elections would have been called. It is therefore reasonable to assume that π would be small, which would speak for an allocation to core districts.

In the theory section, core and swing districts were distinguished through their responsiveness ($\frac{\partial E_i}{\partial B_i}$) and transition probabilities. Neither of these parametres is observable. Generally, in the empirical literature, the share of votes is used as an approximation for swing or core district (see for example Snyder and Levitt, 1995). Since Canada has three major parties (four in Quebec), the variable used to distinguish between the two types of district is the difference between the share of the votes for the party in power (CPC)

[4] All districts have a population of approximately 100 000, except districts in Prince-Edward-Island and in the three territories: Yukon, Northwest Territories and Nunavut that have an approximate population of 30 000 each

and the best opposition party. For simplicity purposes, table 3 uses a cut-off of 10 percent to separate core and swing districts. Districts where the CPC won by more than 15 percent are core party in power districts, and when they won by less than 15 percent, the districts are swing party in power districts. The same cut-off is used for opposition districts.

These univariate results indicate that core party in power districts had more projects than all other types of districts. When considering the value of projects, however, there is no difference across the types of districts. Since swing districts (party in power or opposition) did not receive more projects or money, these preliminary results would speak for the core district hypothesis. It could however be the case that certain socio-economic groups tended to vote CPC and that these groups needed more investment in infrastructure. Table 4 explores this possibility. Not surprisingly, the socio-economic chracteristics of a district are correlated with the party representing it. For example, constituents of CPC districts have higher income, a lower unemployment rate and a higher participation rate. Since CPC districts seem to be richer on average, the positive bias towards CPC district will probably be accentuated when socio-economic variables are included in the multivariate regression.

(Table 3 here)

(Table 4 here)

The first regression models the amount of money spent by the federal government. This amount is used and not the total amount, because the federal government did not control the total value of the project, but only the amount it invested. One problem with the value of projects is its lack of robustness. Every project is indicated at a single location on the map of the EAP, but certain large projects (highways or bridges, for example) could be taking place across many districts. Furthermore, there could be a mistake in the location of projects on the map used to create the dataset. If all projects were of the same magnitude, these two problems would probably even themselves out. The EAP, however, contains a large spectrum of projects of different sizes. It is therefore also useful to model the number of projects in a district as well, because the number of projects is not as much affected by large projects or mistakes. It can therefore serve as a robustness check. I explain these two dependent variables with the socio-economic characteristics of the district, the characteristics of the MP representing the district, and the results of the 2008 election:

$$\text{federal amount} = \beta_1 2008 \text{ Election} + \beta_2 \text{ MP} + \beta_3 \text{ socioeconomic} + \epsilon \quad (20)$$

The coefficients of interest are those related to 2008 elections. If the core district hypothesis is true, one would expect a positive coefficient for districts that elected a CPC candidate in 2008. Furthermore, if the model elaborated previously and the one from Cox & McCubbins (1986) are correct, one would predict a positive coefficient for the difference between the CPC candidate and the best opposition candidate as illustrated by figure 2. This difference is small and postive when a CPC candidate is elected by a small margin and is large and negative when an opposition candidate is elected with a large margin. Conversely, if the swing district hypothesis is correct, I expect a significant negative coefficient on the absolute value of the difference between the CPC candidate and the best opposition candidat. When this difference is small, the district is considered a swing district (see figure 2).

(Figure 2)

Alvarez & Saving (1987b) and Smart & Milligan (2005) show that MP characteristics play a major role in the distribution of pork barrel. More experienced and better connected MPs should be able to bring more money to their district. More specifically, members of the Privy Council and more experienced MPs should bring more money to their district. The Privy Council is not particularly well known among Canadians, but all its members are actual or former members of the cabinet. These politicians are or have been important figures of government, and therefore know its inner-workings. It is therefore realistic to assume that they have an advantage when seeking projects for their constituents. As for experience, I include two dummies: fewer than 5 years of experience as MP and more than 10 years of experience as MP.

The purpose of the EAP is to support families and communities in need. The socio-economic characteristics of districts should remove this effect and show to which extent spending was directed towards these communities. The unemployment rate should, for example, be positively correlated with the value of projects, while the median income of the district should negatively impact the resources going towards a given district. Independently of these characteristics, some districts simply require more money. For example, districts comprising the downtown area of a city have more and older infrastructure, and districts located in the North are in dire need for infrastructure.

3.3 Estimation of the Electoral Impact of Projects

The second part of the empirical verification provides evidence for the fact the key assumption of the model: government spending brings an electoral benefit to the district incumbent. The objective is to study the impact of the EAP projects on the reelection probability of the district incumbent party using the total amount spent in the district, the 2008 election results, and MP characteristics in a probit regression. The variable of interest is the total amount of spending in a district. This variable is used instead of the amount spent by the federal government, because it is easier for voters to assess the total value of a project than to determine how much the federal government invested. Actually, in light of the publicity done by the federal government, it would not be surprising that voters give full credit to the federal government for projects only partially funded by it. As in the previous model, the number of projects in a district is also used, but the motivation is slightly different. When voters travel through the district, the probability of them seeing the poster of a project and being reminded of the EAP would depend on the number of projects, not on the value of projects. By using both the total value and the number of projects, I can compare the two coefficients. A significant difference would indicate whether there is an electoral benefit to undertake many low-scale projects or a few expensive projects. Finally, to provide more robustness to the findings, I also run a regression explaining the difference in the shares of votes between the 2011 and 2008 elections for the party who won the 2008 elections. If, for example, the liberal party won the district with 45 % of the vote in 2008 and 50% in 2011, the value of the variable for this district is 5%. If government spending provides an electoral benefit to the incumbent, more money should be correlated with an increase in this difference.

As noted by Snyder & Levitt (1997), it would be inappropriate to simply use the total amount (or the number of projects) in the regression, because of a missing variable bias. Both the total value of projects in a district and the probability of reelection are correlated with the perceived tightness of the race and with the political skills of the incubment. In the latter case, incumbents with superior political skills will have the connections to direct money towards their districts, and these skills will also serve them to secure reelection. Since neither the perceived tightness of the race nor the political skills can be observed and included in a regression, instrumental variables are needed to remove the correlation between explanatory variables and the error term. Such variables should be correlated with the total value of projects, but uncorrelated with the probability of reelection. The instrument chosen is

whether the district comprises the downtown of a major city. Downtown districts have more and older infrastructure. They therefore need more money. However, there is no reason to believe that constituents in downtown districts have a greater or lower tendency to reelect the incumbent party. The equations estimated are therefore:

To verify this claim, I compare downtown districts with non-downtown districts in table 5. Two differences stand out: there are fewer children and more immigrants in downtown districts. Since immigrants probably have not had time to choose a favourite party, their vote could be more volatile. Similarly, downtowns probably have a greater fluctuation of people thus leading to a greater fluctuation in party allegiance. Both factors would speak for a negative relationship between the reelection of the district incumbent party and downtown districts. If this were the case, it would mean that the number of projects in a district would have a negative impact on incumbency since there were more projects in downtown districts. Since the opposite is found (see table 8), the number of immigrants and the transient nature of downtowns do not jeopardize the validity of the instruments.

Furthermore, there is no evidence that downtown districts have had a higher probability of reelecting the incumbent in previous elections. The probability of an incumbent party to be reelected in the 2004, 2006 and 2008 elections was 86.7 percent in downtown districts and was 83.6 percent in non-downtown districts. This difference is not significant. If I include regional dummies (East, Quebec, Ontario and West) and time dummies in a probit regression, the variable downtown is still not significant.

(Table 5 here)

The 2004 election is particularly interesting, because it followed a recession (2001-2002) as did the 2011 election. During the 2004 election, 80 percent of downtown incumbents were reelected and 83 percent of non-downtown incumbents were reelected. There was no major spending program following the 2001 recession. There was also no special measure in the 2003 or 2004 budgets [5] which could have favoured downtown locations. Budget 2003 increased spending for municipal infrastructure by $ 3 billion over ten years, and budget 2004 alloted $1 billion for the municipal rural infrastructure fund (Canadian Department of Finance, 2011). In comparison to the $ 42 billion plan over two years, these two initiatives are very small, and the biggest

[5]There was no budget in 2002 as the 2001 budget was in December.

from the two, the municipal rural infrastructure fund clearly went to rural districts. There was therefore no increase in spending in downtown districts preceding the 2004 election. Had there been such a program and a similar incumbent reelection probability, it would mean that spending does not necessarily affect the reelection of incumbents. All in all, downtown districts have not been more prone to reelect incumbents, especially not in elections following economic downturns.

The last check to insure the validity of the instrument is to examine who were the incumbents in downtown districts in the 2011 election. It could be that parties put special candidates into downtown districts, because these districts might have more visibility. Table 6 presents the previous employment of downtown incumbents for the 2008 elections. The only one who is member of the privy council is Bob Rae. Olivia Chow and Marc Garneau are the two other ones who would be known across Canada. The incumbents in downtown districts do not stand out as being different from other members of Parliament.

(Table 6 here)

Since the downtown variable is also able to withhold these tests, it is a valid instrument, and I can estimate the following equations:

$$\text{Reelected} = \beta_1 \text{Spending} + \beta_2 \text{Election Results} + \beta_3 \text{MP Char} + \epsilon \quad (21)$$

$$\text{Spending} = \gamma_1 \text{Downtown} + \gamma_2 \text{Election Results} + \gamma_3 \text{MP Char} + u \quad (22)$$

Since a CPC government allocated the resources, theory would suggest that I also test whether spending had an impact on the election of CPC candidates instead of testing only whether it had an impact on the reelection of district incumbent. Unfortunately, the missing variable bias makes it difficult to test the former model. It would be very difficult to find valid instruments for a regression with the election of the CPC as dependent variable. Indeed, any district characteristic related with the spending pattern would be correlated with the party elected. Districts in the north, for example, could have been brought towards the CPC in the 2011 elections due to their opposition to the long gun registry. District characteristics not related with the election of a CPC candidate would probably be only remotely related to the spending. This situation would therefore lead to a weak instrument problem, and the relatively small sample of 308 observations would make identification nearly impossible.

The second block of explanatory variables stems from the 2006 and 2008 elections. The first variable is the difference between the winning and runner-up candidate independently of parties in the 2008 elections. When this difference is small, I expect the probability of defeat of the incumbent to be high. The second variable consists of a dummy whether the district reelected the same party in 2006 and 2008. A district that changed hands between 2006 and 2008 is volatile and will probably change hands again in 2011. The last variable is whether the district elected a candidate from the CPC in 2008 and captures the gain of popularity of the CPC from 2008 to 2011.

The third block consists of MP characteristics. Certain MPs are better known, which should help their reelection bid. I therefore include whether the MP is a member of the Privy Council, and two dummies for experience.

4 Results and Discussion

4.1 Impact of Political Allegiance on the Distribution of Projects

Table 7 presents the results of the regression explaining the federal amounts spent by district. The first surprising result is the general lack of significance of socio-economic variables. One of the pillars of the plan was to provide support to communities and families, but there is no indication that money was directed towards poorer districts in need of support. One possible explanation is that census data from 2006 no longer reflected the relative poverty of districts in 2009, possibly because the financial crisis hurt specific districts independently of their initial situation. The plan could therefore still have supported poorer communities and families, but the data used does not capture the specific impact of the financial crisis.

Contrary to findings from Smart & Milligan (2005), MP characteristics played no role in the allocation of funds. This result supports the idea that MPs play little role in policy development in Canada.

The coefficients for the political variables support the"core district hypothesis, and corroborate the results of Smart & Milligan (2005). Furthermore, the results correspond exactly to the predictions from Cox & McCubbins (1986). In Table 7, model (5) shows that the increase in the difference between the share of votes of the CPC candidate and the best opposition

candidate leads to more spending. In other words, districts where the CPC won by a great margin (support group) received a lot of money, districts where it was a close race reaped less (swing districts), and, finally, districts where the opposition party won by a great margin got the least. Unsurprisingly, the CPC dummy is positive and gains significance when going from the over-specified model (2) to the more parsimonious model (4) thus supporting the core district hypothesis.

(Table 7 here)

Table 8 contains the coefficients when the number of projects per district is the dependent variable. This robustness check confirms previous findings concerning political variables. CPC districts did receive more projects, but this coefficient loses its significance when the difference between the CPC candidate and the best opposition candidate is included meaning that the latter variable explains better the variations in the number of projects. For every 1% increase in this difference, the district received 0.3 projects more. This number might seem small but knowing that the average project represents almost $3 million, a small increase in the voting difference would have a substantial impact on the community.

Interestingly, when considering the number of projects, more socio-economic variables become significant. The unemployment rate and the share of senior citizens, for example, become significant and positive. One reason for this sudden change is that poverty reduction projects were smaller in scope but greater in number. Indeed, the average project for the renovation and retrofit of social housing was $107 924, while the average project from the infrastructure stimulus fund was close to one million dollars.

(Table 8 here)

4.2 Impact of Projects on Reelection

Before considering the results of the probit regression explaining the reelection of incumbent parties, it is important to consider the significance of the variable: downtown in explaining both the value of federal funding and the number of projects. In both cases, the variable is highly significant, because there is a need for investment in downtown cores. The "downtown dummy explains by itself 27 percent of the variation in federal investment (F-value:

112.2) and 7 percent in the variation in the number of projects (F-value: 23.3). In that sense, it captures enough of the variation to avoid the problem of weak instruments, but it also does not capture too much of the endogenous part of the variable.

Table 9 presents the results of the probit regressions explaining the reelection of the incumbent party of the district. These results must be taken with caution, because the coefficients of instrumental variables are still biased in finite sample in the presence of endogeneity, and it is dubious whether 308 observations are sufficient to assume asymptotic properties. Even though the coefficients of the IV regression are about double the size of the probit coefficients, the Wald test of exogeneity fails to reject exogeneity at the 5% mark in both cases (it rejects at the 10% mark). The endogeneity problem discussed in Levitt & Snyder (1997) might not be as much of a problem as initially assumed, because the federal government does not fully control the total amount of pork barrel going to a given district. The fact that other organisations contribute to the projects could reduce the missing variable bias, because the decisions of these organisations do not depend on the missing variable.

The most important result of table 8 is the significant and positive coefficient for both the number of projects and the total amount spent in a district. This finding contradicts the ones from Samuels (2002), and clearly shows that the incumbent party received credit for the value and the number of projects undertaken in the district as assumed in the model. Since it would be interesting to see whether CPC MPs get more credit, I also ran the regression explaining the number of projects with the interaction between CPC and the number of projects. Since OLS estimates seem unbiased, this regression was done with the setting of model 1. The coefficient of the interaction term was positive but not significant (result not reported), meaning that CPC MPs did not benefit more than opposition MPs from the number of projects spent in their district.

At first glance, it seems surprising that the incumbent party of a district would get any credit for decisions taken by the party in power. However, since voters are generally known to be poorly informed about policies and politicians (Bartels, 1996), it is realistic to think that voters probably know very little about the process leading to the allocation of projects. Voters could therefore give credit to their MP for projects in their district. If voters punish the incumbent for natural disasters (Cole, Healy and Werker, 2008), they could equally well give credit to the incumbents for positive outcomes

outside of his control as reported by Litschig and Morrisson (2011).

The difference in magnitude between number of projects and total amount is small. As previously mentioned, the value of the average project is about $3 million. It would therefore seem that adding an extra project in a district would benefit more the incumbent than an increase of $3 million in an already established project. Again, since the IV estimates are biased in finite sample, this difference only suggests that there could be an advantage to spread out money in many projects instead of concentrating it in a few expensive projects, but more research needs to be done.

As for the other variables, conservative candidates benefited from a net advantage for reelection. This finding is not surprising considering the gain of popularity of the party across Canada. Members of the Privy council and MPs running again tend to be reelected with a greater probability. In both cases, these candidates are better known and therefore have an advantage against challengers. The margin between the runner-up and the elected candidate has a positive but small impact on reelection.

(Table 9 here)

As a final robustness check [6], I also perform a regression explaining the difference between the share of the vote of the winner of the 2008 elections in the 2011 and 2008 elections. If this difference is positive, the incumbent increased his/her popularity from 2008 to 2011. Using a similar model as the one explaining the reelection probability, I find that the number and the total value of projects have a significant positive impact on the share of the vote of the incumbent. One project would have increased the share of the vote by 0.15 percentage point. Since the average electoral district received approximately 50 projects, this impact of these projects would have been an increase in the share of the vote by 7.5 percentage points for the 2008 incumbent. The results provide stronger evidence that the incumbent received an electoral benefit from the projects as is assumed in the model.

(Table 10 here)

5 Conclusion

This paper develops a model of government spending where the incumbent and not the party in power receives electoral credit and finds empirical sup-

[6] I thank Matt Webb for this suggestion

port for it. First, it finds evidence for the core district hypothesis using data from the projects of the 2009-2011 Canada Economic Action Plan. Second, it shows that the number and value of projects undertaken within the economic action plan had a significant impact on the reelection of the incumbent in the 2011 election. The latter empirical finding suggests that pork barrel may not affect only benefit the party in power, but also the district incumbent. This new channel increases the complexity of pork barrel distribution.

Throughout this paper, I consider projects as homogeneous, but this assumption is hardly realistic. Repairs to an aqueduct could be as expensive as repairs to arenas, but the latter is much more visible. Different kinds of projects could serve different purposes. Future research will focus on the differences between the kinds of projects, their distribution and their differential impact on voting. These differences in visibility could explain the variety of empirical results found in the literature. If certain kinds of projects have a great impact on the electorate, third parties should allocate these resources and not politicians to reduce pork barrel spending. The approval process also differs across kinds of project. There is no one person who approved all projects. Different agencies/departments were responsible for different kinds of projects, and all their own procedures. In some cases, there was cooperation with provincial authorities to choose projects; in other cases, NGOs competed to receive financing. If procedures matter, the distribution of these projects will depend on the allocation process. Future research will investigate the numerous processes for different strands of projects and the outcomes they produced. This future research could lead to an improvement in the efficiency of project allocation by finding procedures that minimize the impact of pork barrel spending.

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A Definitions

Diff MP Opp - Cons cand/ Difference between opposition MP and conservative candidate: share of the vote for the opposition canadidate who won the election in the district minus the share of the vote for the conservative candidate. Always positive. If this number is negative, the variable equals 0.

Diff MP Cons - Opp cand / Difference between conservative MP and best opposition candidate: share of the vote for the conservative candidate who won the election in the district minus the share of the vote for the opposition candidate who received the most vote. Always positive. If this number is negative, the variable equals 0.

Difference Cons - Best Opp cand / Difference between conservative candidate and best opposition candidate: share of the vote for the conservative candidate who won the election in the district minus the share of the vote for the opposition candidate who received the most vote.

Northern districts: Labrador, Manicouagan, Abitibi Baie-James Nunavik Eeyou, Kenora, Timmins James Bay, Churchill, Desnethe Missinippi Churchill River, Fort McMurray Athabasca, Peace River, Prince George Peace River, Skeena Bulkley Valley, Yukon, Western Arctic, and Nunavut.

Downtown districts: Quebec, Westmount Ville-Marie, Hamilton Centre, Ottawa Centre, Toronto Centre, Trinity Spadina, Winnipeg Centre, Calgary Centre, Edmonton Centre, and Vancouver Centre.

Privy Council: Humber St. Barbe Baie Verte, Cardigan, Charlottetown, Malpeque, Central Nova, Halifax West, Kings Hants, Sydney Victoria, Beauseejour, Fredericton, New Brunswick Southwest, Beauce, Bourassa, Jonquiere Alma, Laurier Sainte-Marie, Louis-St-Laurent, Megantic L'Erable, Mount Royal, NDG Lachine, Pontiac, Roberval Lac-St-Jean, Saint-Laurent Cartierville, Beaches East York, Bramalea Gore Malton, Cambridge, Carleton Mississipi Mills, Durham, Eglington Lawrence, Etobicoke Lakeshore, Haldimand Norfolk, Halton, Kingston and the Islands, Markham Unionville, MississaugaBrampton South, Mississauga East Cooksville, Niagara Falls, Ottawa Vanier, Ottawa West Nepean, Parry Sound Muskoka, Pickering Scaborough East, Richmond Hill, St. Paul's, Scaborough Agincourt, Scaborough Guildwood, Simcoe-Grey, Thornhill, Toronto Centre, Toronto Danforth, Vaughan, Wellington Halton Hills, Whitby Oshawa, York Centre, York Simcoe, York

West, Charleswood St.James Assiniboia, Provencher, Winnipeg South Centre, Battlefords Lloydminster, Blackstrap, Wascana, Calgary Centre-North, Calgary Nose-Hill, Calgary Southeast, Calgary Southwest, Edmonton Spruce Grove, Yellowhead, Chilliwack Fraser Canyon, Esquimalt Juan de Fuca, Okanagan Coquihalla, Port Moody Westwood Port Coquitlam, Prince George Peace River, Saanich Gulf Islands, Vancouver Centre, Vancouver South, Yukon, and Nunavut.

Cabinet: Egmont, Central Nova, Fredericton, Fundy Royal, New Brunswick Southwest, Jonquiere Alma, Louis-Saint-Laurent, Megantic-L'Erable, Pontiac, Roberval Lac St-Jean, Cambridge, Carleton, Mississipi Mills, Durham, Haldimand Norfolk, Halton, Niagara Falls, Ottawa West Nepean, Parry Sound Muskoka, Simcoe Grey, Whitby Oshawa, York Simcoe, Charleswood St. James Assiniboia, Provencher, Battlefords Lloydminster, Blackstrap, Calgary Centre North, Calgary Nose Hill, Calgary Southeast, Calgary Southwest, Edmonton Spruce Grove, Yellowhead, Chilliwack Fraser Canyon, Okanagan Coquihalla, Port Moody Westwood Port Coquitlam, Prince George Peace River, Saanich Gulf Islands, Nunavut.

Ottawa districts: Hull Aylmer, Gatineau, Ottawa Centre, Ottawa Orleans, Ottawa South, Ottawa Vanier, and Ottawa West Nepean.

B Figures

Figure 1: Timeline of Events

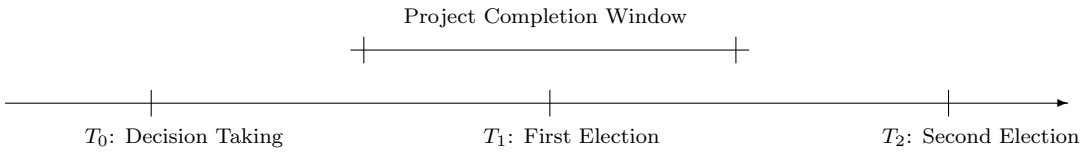
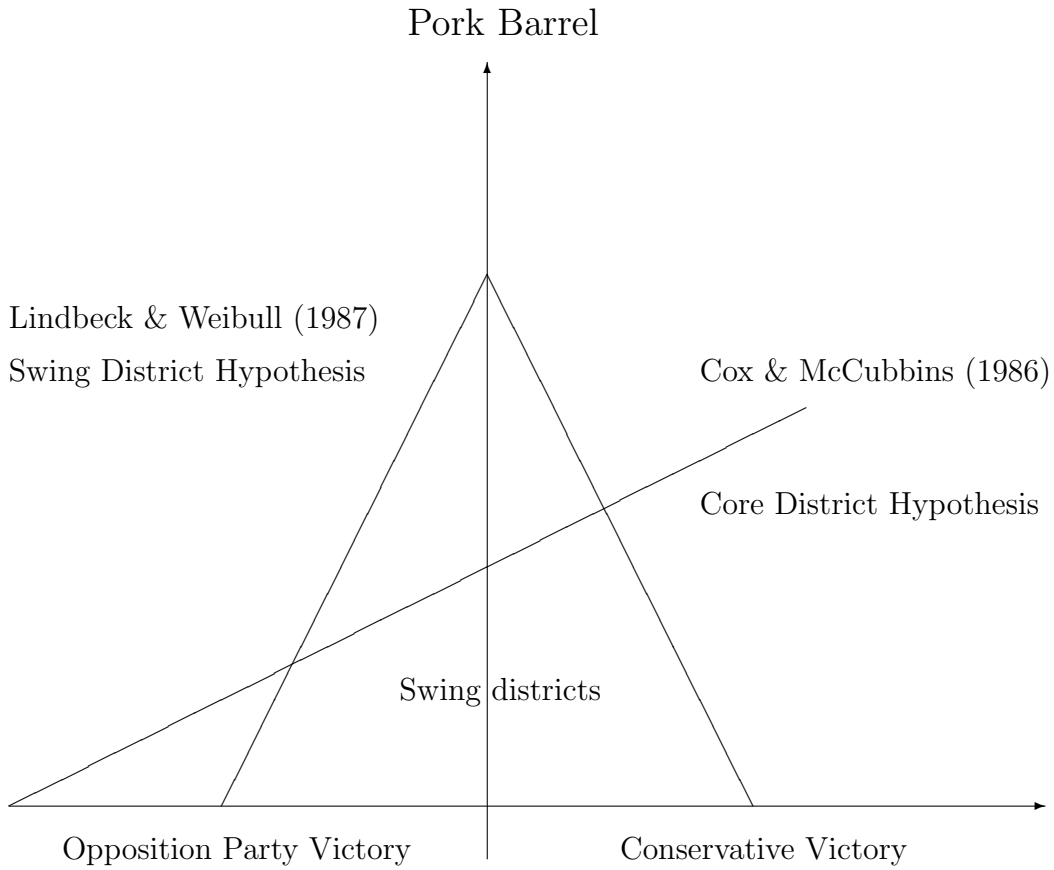


Figure 2:
Empirical Predictions for the Amount of Pork Barrel



Difference between the share of votes to the conservative candidate and the share of votes to the best opposition candidate

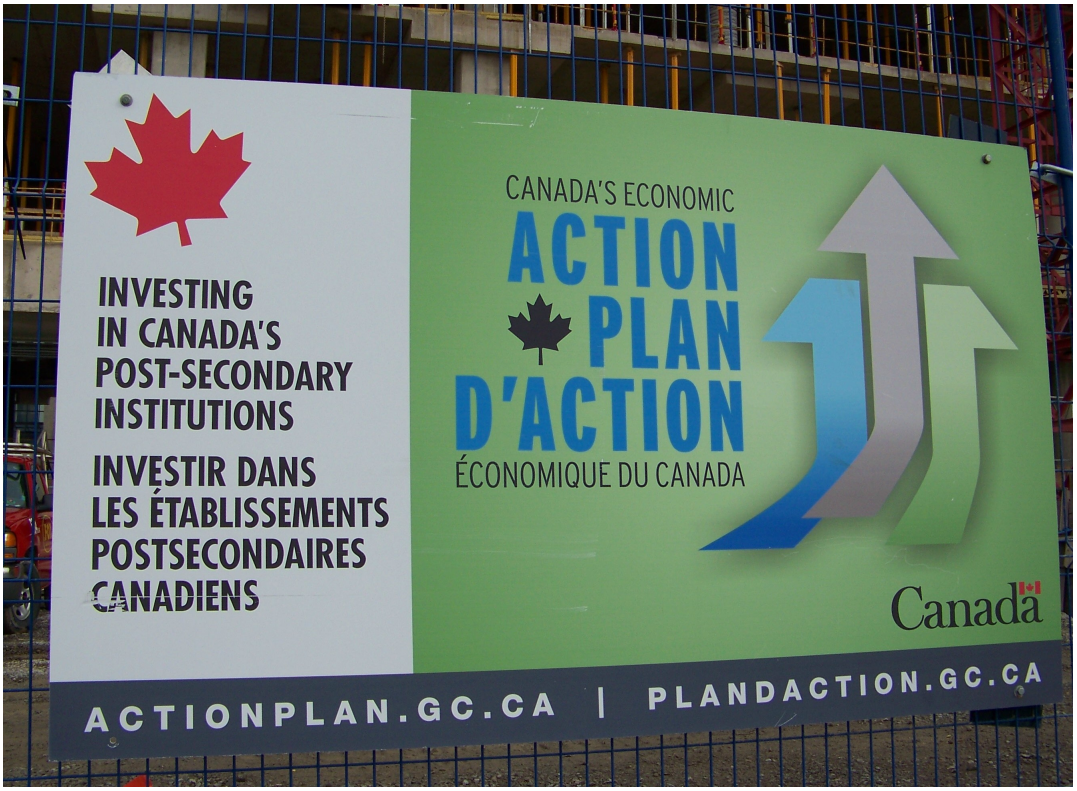

INVESTING
IN CANADA'S
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Figure 3

C Tables

Table 1: Transition Probability of Status

		District Status (First Election)			
		CO	SO	SPP	CPP
District Status (Second Election)	CO	65	25	10	0
	SO	25	35	30	10
	SPP	10	30	35	25
	CPP	0	10	25	65

Note: All numbers are probabilities.
Definitions: CO: Core Opposition, SO: Swing Opposition, SPP: Swing Party in Power, and CPP: Core Party in Power.

Table 2: Upper bound of $\frac{\frac{\partial E}{\partial B}|_{spp}}{\frac{\partial E}{\partial B}|_{cpp}}$ to ensure a distribution to core districts for different values of π

π	Upper Bound
0.1	2.34
0.2	1.87
0.3	1.60
0.4	1.43
0.5	1.30
0.6	1.21
0.7	1.14
0.8	1.08
0.9	1.03
1.0	1

Table 3: Distribution of Projects per District according to the Results of the 2008 Elections

	Average Number of Projects	Total Federal Investment (million $)	Total Value (million $)	Number of Districts
Core Party in Power	56.5	56.7	149	103
Swing Party in Power	47.5	48.7	111	43
Swing Opposition	43	53	139	52
Core Opposition	43.9	57	135	109

Note: Core Party in Power districts are those where the candidate from the Conservative Party of Canada (CPC) won by more than 15% of votes. Swing Party in Power districts are those where the candidate from CPC won by fewer than 15% of votes. The CPC candidate lost in opposition districts by less than 15% (swing opposition) or by more than 15% (core opposition). There are 308 electoral districts in Canada, but the CPC party did not present a candidate in the district of Port-Neuf-Jacques-Cartier in the 2008 election. For this reason, the sum of districts is 307.

Table 4: Socio-Economic Description of Districts

	Conservative	Opposition	Significant Difference in Means (5%)
Population	105,060	100,568	No
Share under 19 (%)	25.8	23.2	Yes
Share over 65 (%)	13.8	13.9	No
Median Income ($)	67,670	60,900	Yes
Immigrant (%)	14.0	21.2	Yes
Aboriginal (%)	5.8	3.6	Yes
Unemployment Rate (%)	5.8	8.1	Yes
Downtown (%)	1.4	4.8	No
North (%)	4.2	4.8	No
National Capital Region (%)	1.4	3	No
Number of Districts	142	166	

Note: The variables are described in more details in the appendix.

Table 5: Socio-Economic Description of Downtown Districts

	Non-Downtown	Downtown	Significant Difference in Means (5%)
Population	102,363	110,869	No
Share under 19 (%)	24.7	16.0	Yes
Share over 65 (%)	13.8	13.6	No
Median Income ($)	64,070	62,565	No
Immigrant (%)	17.6	28.0	Yes
Aboriginal (%)	4.7	3.6	No
Unemployment Rate (%)	7.0	6.7	No
Number of Districts	298	10	

Note: The variables are described in more details in the appendix.

Table 6: Previous Employment of Downtown Incumbents in 2011 Elections

District	Party	Name	Life before federal politics
Quebec	BQ	C. Gagnon	real estate agent
Westmount-Ville-Marie	Lib.	M. Garneau	military, astronaut
Ottawa Centre	NDP	P. Dewar	teacher, union activist
Toronto Centre	Lib	B. Rae	Ontario premier
Trinity Spadina	NDP	O. Chow	municipal politician
Hamilton Centre	NDP	D. Christopherson	Union activist
Winnipeg Centre	NDP	P. Martin	Business manager
Calgary Centre	CPC	L. Richardson	Political staff
Edmonton Centre	CPC	L. Hawn	Military
Vancouver Centre	Lib	H. Fry	Medical Doctor

Table 7: Allocation of Federal Money to Canadian Electoral Districts

	(1)	(2)	(3)	(4)	(5)
Diff MP Opp - Cons cand	-530786.0				
	(-1.46)				
Diff MP Cons - Opp cand	260696.8				
	(1.40)				
Conservative 2008		15379764.9		14311302.5*	
		(1.95)		(2.05)	
Diff Cons - Best Opp cand			364120.6*		298561.6*
			(2.42)		(2.25)
Privy Council	-13993642.3	-12665829.7	-13533706.8		
	(-1.85)	(-1.72)	(-1.84)		
MP less than 5 years	1552446.8	2261979.2	2775101.1		
	(0.19)	(0.33)	(0.40)		
MP more than 10 years	4527982.6	3344735.8	3820685.1		
	(0.51)	(0.37)	(0.42)		
Total population	270.4	267.0	263.8		
	(1.90)	(1.86)	(1.85)		
Share below 19	-422086089.0*	-393948528.8*	-420169438.9*	-311250665.7**	-333904765.5**
	(-2.30)	(-2.20)	(-2.30)	(-3.15)	(-3.17)
Share above 65	-104346933.2	-76191796.8	-89784836.2		
	(-0.75)	(-0.55)	(-0.66)		
Median income	-51.28	26.71	-11.91		
	(-0.17)	(0.09)	(-0.04)		
Share immigrant	-12732885.2	-12913268.1	-10080145.4		
	(-0.44)	(-0.44)	(-0.34)		
Share aboriginal	29976526.6	37365345.3	33788890.7		
	(0.69)	(0.81)	(0.76)		
Unemployment rate	136446715.8	76287842.2	132435259.7		
	(1.76)	(1.05)	(1.74)		
Downtown	167353242.9***	168399545.6***	167068846.8***	178592420.0***	177367505.2***
	(3.49)	(3.47)	(3.48)	(3.54)	(3.56)
North	98879857.9***	97395377.1***	98133575.9***	104444834.2***	106373469.6***
	(5.78)	(5.43)	(5.71)	(6.92)	(7.08)
Ottawa	14503623.9	13066180.8	15166095.3		
	(0.92)	(0.81)	(0.97)		
Constant	133599904.8	112116957.6	125179029.7	113935317.6***	125487882.4***
	(1.87)	(1.73)	(1.89)	(4.85)	(4.84)
R^2	0.395	0.388	0.395	0.373	0.378
N	307	308	307	308	307

t statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
Note: all standard errors are robust. The variables are defined in the appendix.

Table 8: Allocation of Projects to Canadian Electoral Districts

	(1)	(2)	(3)	(4)	(5)
Diff MP Opp - Cons cand	-0.516***				
	(-3.86)				
Diff MP Cons - Opp cand		0.339***			
		(3.70)			
Conservative 2008			10.89**	-1.124	-0.747
			(2.88)	(-0.23)	(-0.16)
Diff Cons - Best Opp cand				0.297***	0.308***
				(3.59)	(3.84)
Privy Council	1.805	3.138	2.701	1.920	
	(0.47)	(0.83)	(0.68)	(0.50)	
MP less than 5 years	-4.884	-0.995	-3.110	-2.839	
	(-1.61)	(-0.35)	(-1.02)	(-0.95)	
MP more than 10 years	6.875	4.656	5.243	5.610	
	(1.74)	(1.14)	(1.30)	(1.40)	
Total population	0.00000970	-0.0000142	-0.0000124	-0.0000156	
	(0.09)	(-0.13)	(-0.11)	(-0.14)	
Share below 19	12.22	14.62	16.47	-7.195	
	(0.21)	(0.25)	(0.27)	(-0.12)	
Share above 65	189.9**	232.0***	211.2***	198.8***	176.0***
	(3.20)	(4.17)	(3.48)	(3.42)	(4.30)
Median income	0.000107	0.000226	0.000183	0.000149	
	(0.63)	(1.35)	(1.04)	(0.88)	
Share immigrant	-58.12***	-49.43***	-52.85***	-49.99***	-50.87***
	(-6.89)	(-5.60)	(-5.98)	(-5.84)	(-7.49)
Share aboriginal	49.09	60.08	55.06	52.06	
	(1.24)	(1.60)	(1.38)	(1.39)	
Unemployment rate	259.4***	249.1***	228.5***	276.8***	280.5***
	(4.77)	(4.64)	(4.12)	(5.24)	(5.51)
Downtown	48.91***	47.81***	48.38***	47.20***	50.82***
	(4.47)	(4.62)	(4.47)	(4.45)	(4.92)
North	27.59*	25.48*	26.74*	27.48*	42.16***
	(2.32)	(2.17)	(2.18)	(2.41)	(4.22)
Ottawa	14.16	16.38	14.79	16.66	
	(1.30)	(1.55)	(1.30)	(1.55)	
Constant	3.819	-20.82	-13.22	-2.076	9.532
	(0.13)	(-0.78)	(-0.45)	(-0.07)	(1.40)
R^2	0.459	0.453	0.444	0.467	0.439
N	308	307	308	307	307

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Note:All standard errors are robust. The variables are defined in the appendix.

Table 9: Reelection of District Incumbent Party in the 2011 Elections

	(1) Probit	(2) IV Probit	(3) IV Probit	(4) Probit	(5) IV Probit	(6) IV Probit
Number Project	0.0122***	0.0281***	0.0287***			
	(3.86)	(4.26)	(4.73)			
Value Projects (10mio)				0.0190**	0.0364***	0.0364***
				(3.10)	(3.33)	(3.37)
Conservative 2008	1.746***	1.279**	1.310**	1.782***	1.620***	1.635***
	(7.66)	(3.08)	(3.12)	(8.05)	(6.00)	(6.21)
Change Party 06-08	0.609*	0.304	0.303	0.768**	0.760**	0.787**
	(2.09)	(0.93)	(1.04)	(2.65)	(2.71)	(2.94)
Victory Margin 08	0.0173*	0.0111	0.00791	0.0218**	0.0200**	0.0192**
	(2.31)	(1.41)	(1.07)	(2.91)	(2.73)	(2.81)
MP Ran	0.532	0.573		0.662*	0.697*	0.704*
	(1.64)	(1.96)		(1.97)	(2.17)	(2.26)
MP less 5 years	0.138	0.195		0.102	0.0741	
	(0.58)	(0.90)		(0.43)	(0.33)	
MP more than 10 years	0.0744	0.0409		0.0879	0.0152	
	(0.29)	(0.17)		(0.34)	(0.06)	
Privy Council	0.373	0.322		0.484*	0.557*	0.542*
	(1.57)	(1.46)		(2.04)	(2.44)	(2.57)
[1em] Constant	-1.823***	-2.356***	-1.655***	-1.783***	-1.973***	-1.935***
	(-4.54)	(-6.40)	(-8.05)	(-4.23)	(-4.88)	(-5.14)
R^2	0.38			0.37		
N	308	308	308	308	308	308

t statistics in parentheses
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Note: In column 1, the number of project is used to explain the re-election of the district incumbent party in a probit regression. In columns 2 and 3, whether the district was downtown or not was used as instrument for the number of projects. Even though, the coefficient from the IV regression is twice the one from the probit regression, the Wald test cannot reject exogeneity at the 5% level. In column 4, the value of projects (10 mio) is used in a probit regression to explain the dependent variable. In columns 5-6, the fact that the district or not was downtown is used as instrument for the value of projects. Even though, the coefficient from the IV regression is twice the one from the probit regression, the Wald test cannot reject exogeneity at the 5% level.

Table 10: Changes in the Share of the Vote for the 2008 Winner Between 2011 and 2008 Elections

	(1)	(2)	(3)	(4)	(5)	(6)
Number Project	0.0553***	0.162**	0.150*			
	(3.82)	(2.65)	(2.36)			
Value Projects (10mio)				0.0650*	0.170**	0.164**
				(2.07)	(2.77)	(2.76)
Conservative 2008	11.00***	10.08***	11.07***	11.40***	11.28***	11.59***
	(11.61)	(8.73)	(9.90)	(11.76)	(11.40)	(12.22)
Change Party 06-08	4.194**	3.243*		4.887**	5.211***	5.537***
	(2.62)	(2.03)		(3.06)	(3.58)	(4.07)
Victory Margin 08	-0.100***	-0.118***	-0.163***	-0.0910**	-0.0916**	-0.101**
	(-3.42)	(-3.39)	(-5.26)	(-3.05)	(-2.87)	(-3.30)
MP Ran	5.144**	5.743**	6.763***	5.245**	5.906***	6.022***
	(2.80)	(3.15)	(3.99)	(2.99)	(3.36)	(3.73)
MP less 5 years	1.413	1.819		1.031	0.751	
	(1.29)	(1.47)		(0.93)	(0.64)	
MP more than 10 years	-0.187	-0.208		-0.502	-1.029	
	(-0.15)	(-0.14)		(-0.38)	(-0.73)	
Privy Council	-0.124	0.176		0.0286	0.525	
	(-0.12)	(0.14)		(0.03)	(0.43)	
Constant	-14.55***	-19.52***	-18.09***	-13.18***	-15.11***	-14.85***
	(-6.97)	(-5.85)	(-5.22)	(-7.36)	(-7.49)	(-7.48)
N	307	307	307	307	307	307

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Note: These models explain the difference between the share of votes received by the candidate who won the 2008 election in the 2011 and 2008 elections. If, for example, the winner of the 2008 elections received 40 % of the vote in 2008 and 50% of the vote in 2011, the value of the variable is 10% for this electoral district. In column 1, the number of project is used to explain this difference in a OLS regression. In columns 2 and 3, whether the district was downtown or not was used as instrument for the number of projects. In column 4, the value of projects (10 mio) is used in an OLS regression to explain the difference in the shares of votes. In columns 5-6, the fact that the district or not was downtown is used as instrument for the value of projects (10mio).