

A Quantitative Evaluation of the 39th Canadian Federal Election

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Abstract

This article analyzed the effect of campaign expenditure and demographic factors on election outcomes in the Canadian federal election of 2006, using OLS and instrumental variable regression models. The data is a cross-section of electoral districts in Canada. The study focuses on four parties that nominated candidates in most of the 308 electoral districts: Conservative, Liberal, Green, and NDP. It is found that campaign expenditure at district level is a significant determinant of a party's share of the votes, but a candidate's incumbency status and demographic factors are also important. The results show that low-income voters tend to favor the Liberals at the expense of the Conservatives. Expenditure by rival parties significantly reduces a party's shares.

Introduction

Understanding the factors that most likely determine who wins an election has been for long a constant endeavor of researchers and politicians. Candidates would like to know that one of the factors that they can most easily control, campaign spending, would be a reliable predictor of an election outcome. Unfortunately, or fortunately this seems not to be the case. Or it is not so much so as some would like it to be. For citizens, which happen to be the same as the taxpayers, this is good news: there is hope that democracy is not all for sale. For some candidates this is bad news: it implies that it takes more than a good fund raising campaign to win an election.

Both Canada and the United States regulate campaign financing, but their regulating principles are very different. In the US, the *Federal Election Campaign Act* of 1971 and the *Bipartisan Campaign Reform Act* of 2002 are not concerned with making elections less expensive or more equitable, but making them more transparent. The idea is not to restrict the candidate's right of free speech, but let the voters penalize inappropriate sources or uses of campaign money if they so wish to do. In Canada, the *Election Expenses Act* of 1974 and the *Canada Elections Act* with its amendments mainly reflect equity concerns: the electoral system is intended to provide a level playing field for all candidates from financial point of view. Thus, as opposed to the US, Canada imposes limits on the amounts a candidate may spend in a campaign, as well as the amounts a donor can contribute. (Griner and Zovatto, 2005, compare the U.S. and Canada electoral systems.)

Quantitative evaluations of the effects of campaign spending on voting outcomes are notoriously difficult because of the two-way causality between spending and a candidate's share of votes. To be more precise, there is not quite a two-way causality but a third factor, a candidate's popularity

determines both spending (through contributions) and a candidate's share. Since popularity cannot be measured, determining the effect of campaign spending on votes becomes a complex empirical task.

Gerber (1998), building on such work as Gelman (1990) is among the first to recognize that campaign spending and vote share are endogeneous (are both determined by some other, unobservable factors). The implications of this idea challenged the common wisdom that the dollar spent by an incumbent candidate was less effective than the dollar spent by a challenger. To address the aforementioned endogeneity problem, Gerber proposes three instrumental variables – factors correlated with spending but not with popularity: a candidate's wealth, the number of voters in the candidate's electoral district (state), and the total spending by both incumbent and challenger in the previous election in the state. Subsequent studies try to find better instrumental variables, but by and large they confirm Gerber's (1998) findings about the effect of spending by incumbent versus challenger.

In spite of the large amount of work being done to solve the question of whether the incumbent or the challenger is more likely to benefit from the extra dollar spent on campaign, the answer is still debatable. In part, the difficulty of disentangling the expenditure variable from the explained vote share variable is responsible for these contradictory results. (A recent study that marginally addresses this question is Milligan and Rekkas, 2008).

Another important breakthrough in the study of elections is how the understanding of two-party contest mechanisms applies in the context of multi-party elections. Katz and King (1999) is one of the first in-depth empirical analyses of multi-party elections. The authors use, again a novelty

at the time, electoral district level data. Using a maximum likelihood method, the authors also find a slight but significant advantage for the incumbent party.

One of the novelties of this project is to determine whether income and unemployment have an important impact on the elections outcome. One would expect that the Liberals, as opposed to the Conservatives would benefit from the support of those voters in the lower ranges of income and employment. The role of a party's ideology has been largely ignored in the quantitative literature, probably because the tendency in the contemporary political parties is to become more pragmatic than ideological.

Data and Model

This report is based on the 39th federal election in Canada, which took place in 2006. The 40th election of 2008 may be included in this study when complete financial information becomes available. Data is aggregated at the electoral district level. Election outcomes and spending amounts by each candidate come from Elections Canada's web site, while demographic data for each of the 308 districts was compiled from Statistics Canada's public data files.

The names of the variables considered in the following statistical models include the suffixes 'cons,' 'lib,' 'green,' and 'ndp' indicating to which of the four parties a variable refers. The appendix gives a descriptive statistics table. The variable 'share' is a party's share of votes in an electoral district. Obviously, 'share' must take values between 0 and 1. The sum of shares for the four parties considered is typically less than one because of the votes that go to the other parties represented in the district but not included here. The variables considered in this analysis are as follows:

Share	Share of votes obtained by a party in a particular district
Incumbent	=1 if a candidate is incumbent, =0 otherwise
Texp (Spending)	A party's campaign expenditure in a district (Total EXPenditure)
Lowincp	Percentage of low-income persons in district population
Immgrp	Percentage of immigrants in district population
Unemprate	Unemployment rate in district
Dummy BC	Dummy =1 if province = 'BC' and =0 otherwise
Dummy West	Dummy =1 if province = 'AB,' SK,' or 'MB,' and =0 otherwise
Dummy Quebec	Dummy =1 for Quebec and =0 for all other provinces

The base for comparison for the dummy variables is Ontario plus all other provinces and territories that are not represented in the model. The statistical model consists of one regression equation for each party. Using a single equation for all parties is inadequate because vote shares in each district are inter-related: they are close or sum up to one in many districts. Therefore, while a given set of values of the independent variables can only predict one value of the vote share, in reality there are several share numbers in a district – one for each party. The explained variable is a party's share of the valid votes cast at each district. Here only the four parties that were present in most of the 308 districts are considered, the Conservatives the Liberals, the Greens and the NDP. This limitation was chosen against the alternative of picking only those districts where all parties were represented, which would have implied a large share of missing data.

The Achilles' heel of all studies involving campaign expenditures is how this variable is instrumented. Milligan and Rekkas (2008) choose the spending limits in each district as an

instrument for actual expenditure. However, the limits depend in a sophisticated but deterministic way on the population density in district. A simpler instrument, district population is possibly at least as appropriate as campaign spending limits. Campaign spending is higher in districts having higher population.

Results and discussion

Table 1 summarizes the results of two models, Ordinary Least Squares (OLS) and Instrumental Variables (IV), each applied separately to the four parties. One should not lightly dismiss an OLS model in favor of an instrumental variable model when the instruments available are weak, because the latter comes at a cost in terms of efficiency. With weak instruments, probably the best choice is to estimate both models and use judgment in interpreting their results. In addition, here a third model is estimated, one in which the campaign spending by a party, the variable causing the endogeneity issue is excluded, but the rivals' expenditures are included instead.

Examining Table 1, a first observation is that the coefficients of many variables do not change sign when moving from OLS to IV and still remain significant. The estimates for the Green party should be considered with caution, since the low R^2 may indicate flaws in the data.

[Table 1 about here]

The discussion of results concentrates on three questions. First, is there evidence of an ideological component in the election? For instance, would less favored persons be more likely to prefer a particular party? Second, when controlling for all other relevant factors, does a regional component in the pattern of votes persist? In other words, would one likely vote a

certain party only because of being an inhabitant of a certain province or region? Third, how important spending by rival parties is in determining a party's share, and how could one interpret such a result?

Some evidence of ideological voting exists in the data, though many believe that politics these days is becoming overly pragmatic. However, such evidence is not consistent across parties. Everything else being equal, low-income voters tend to distrust the Conservatives, while immigrants tend to favor the Liberals and the Greens.

Regional dummies are also highly significant in many of the estimates, which suggests that those who live in certain areas tend to have a favorite party beyond all other determinants of their vote. This result is still in need of understanding, because it is not obvious why region would matter when all other variables are accounted for. Data show that western provinces (BC excluded) tend to prefer the Conservatives and the Greens at the expense of the Liberals, who perform better in Ontario than BC, and that most of the parties included in this study perform worse in Quebec than in Ontario. This finding may seem trivial when looking at the number of seats won by each party in different provinces, but what makes it interesting is its persistence after controlling for all other factors.

The models summarized in Table 2 attempt to avoid the endogeneity problem of campaign spending by dropping this variable from all equations and replacing it with spending by competitors. In addition to the previous models, those in Table 2 consider spending in per-capita terms, thus accounting for the differences in population between various districts. Per capita spending by competitors appears to be an important determinant of a party's shares. A first possible explanation of this finding could be that a vote going to a party because of that party's

spending is a vote less for the competitors. However, this does not have to be so because much of the campaign funds are directed to convince citizens to go to vote. From this point of view, a party's dollar spent on campaign creates a 'public good' in the sense that all parties benefit from it.

Another possible explanation could be that parties spend large resources on negative campaign, and the coefficients in Table 2 might be viewed as a measure of negative campaign. For instance, according to the estimates in Table 2, Model 1, an additional (per capita) dollar spent by the Liberals reduces the Conservatives share by an average of 7.117 percentage points.

[Table 2 about here]

A bizarre result is that an increase in the Conservatives' expenditure would in fact increase the Liberals chances. Although theoretically this may be possible via the 'public good' effect discussed above, it may also be the result of errors in the data (there is a significant fraction of missing data in Model 2, which may bias its coefficients.) Another possible explanation of a perverse effect of spending is that a bitterly negative campaign may convince some otherwise apathetic voters to vote for a competitor. To determine which of these effects prevail is a matter of empirical investigation.

Conclusion

The 39th federal election data shows, first, that people still form their political preferences along ideological lines, at least to some extent. In particular, the Liberal Party tends to be the average choice for immigrant persons, while low-income persons seem not to trust the Conservatives.

Second, data reveal a regional cleavage in voting preferences, which persists when all other factors are accounted for. Finally, the effect of competitors' campaign spending on a candidates share is found to be mainly negative and significant. Theoretically, several opposite consequences of campaign spending are identified, and which of these prevail is an empirical question and a possible extension of this report.

References

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Table 1: For each party, the dependant variable is ‘Share’ in both OLS and IV equations. All equations were estimated using heteroskedasticity robust standard errors. Spending is the endogenous included variable; unemployment rate and income per capita are instruments. Tests (Hansen’s J statistic, Anderson) indicate that the instrumental variables are relevant, but weak. The null hypothesis of exogeneity of the instrumented variable (spending) is rejected in appropriate tests (Durbin-Wu-Hausman).

	(1) Cons OLS	(2) Cons IV	(3) Lib OLS	(4) Lib IV	(5) Green OLS	(6) Green IV	(7) NDP OLS	(8) NDP IV
incmbcons	12.30 ^a (1.670)	10.66 ^a (2.183)						
lowinc	-0.954 ^a (0.110)	-0.979 ^a (0.148)	0.123 (0.0812)	0.349 (0.280)	-0.0162 (0.0256)	-0.0427 (0.0336)	0.687 ^a (0.0994)	-0.0265 (0.320)
immgrp	5.651 (3.759)	-2.511 (6.202)	22.87 ^a (3.489)	40.23 ^a (10.62)	1.473 ^c (0.865)	2.100 ^c (1.084)	-24.13 ^a (3.245)	-2.793 (10.58)
ibc	2.187 (1.810)	-2.470 (2.466)	-8.375 ^a (1.149)	-17.92 ^a (5.737)	1.091 ^a (0.396)	0.590 (0.651)	7.342 ^a (1.744)	-0.943 (4.526)
iwest	14.40 ^a (2.091)	18.37 ^a (3.031)	-10.87 ^a (1.388)	-25.94 ^a (7.407)	1.048 ^a (0.361)	2.256 ^a (0.328)	-3.195 ^b (1.355)	0.190 (1.454)
iq	-4.584 ^a (1.559)	13.24 ^b (5.529)	-11.87 ^a (1.307)	-28.02 ^a (7.452)	0.108 (0.252)	1.816 ^a (0.342)	-15.06 ^a (1.034)	-2.515 (5.620)
texpcns		0.000493 ^a (0.000137)						
incmblib			15.30 ^a (1.013)	22.16 ^a (3.793)				
texplib				-0.000803 ^b (0.000326)				
texpgreen						0.000699 ^a (0.000123)		
incmbndp							21.30 ^a (2.468)	3.661 (9.488)
texpndp								0.000515 ^b (0.000245)
<i>N</i>	308	244	308	291	308	256	308	297
<i>R</i> ²	0.655	-	0.784	-	0.071	-	0.608	-

Standard errors in parentheses

^c $p < 0.1$, ^b $p < 0.05$, ^a $p < 0.01$

Table 2: OLS regressions, including campaign spending by competitors.
The dependant variable is each party's vote share.

	(1) Cons OLS	(2) Lib OLS	(3) Green OLS	(4) NDP OLS
incmbcons	8.474 ^a (1.338)			
texppndp	-21.94 ^a (2.370)	-2.616 (2.388)	-1.260 ^b (0.522)	
texpplib	-8.007 ^a (2.571)		-1.160 ^b (0.517)	3.316 (3.244)
texppgreen	-19.69 ^b (9.522)	-4.731 (8.845)		6.557 (15.44)
lowinc	-0.409 ^a (0.132)	0.110 (0.122)	0.120 ^a (0.0333)	0.690 ^a (0.140)
iq	-15.82 ^a (1.843)	-10.40 ^a (1.842)	-1.961 ^a (0.423)	-13.84 ^a (1.723)
ibc	2.391 ^c (1.302)	-6.263 ^a (1.456)	0.613 (0.508)	11.43 ^a (2.413)
iwest	10.40 ^a (1.770)	-9.361 ^a (1.850)	-0.345 (0.393)	-1.752 (1.699)
immgrp	-17.91 ^a (4.324)	31.63 ^a (4.737)	-2.485 ^b (1.103)	-26.47 ^a (4.316)
incomep	1.107 (2.312)	4.982 ^c (2.567)	1.882 ^a (0.516)	2.455 (3.771)
unemprate	-0.490 ^b (0.192)	0.636 ^b (0.298)	-0.252 ^a (0.0411)	0.294 (0.274)
incmblib		11.91 ^a (1.140)		
texppcons		5.588 ^a (1.962)	-1.753 ^a (0.596)	-1.005 (3.997)
incmbndp				17.44 ^a (3.768)
<i>N</i>	236	199	226	192
<i>R</i> ²	0.797	0.825	0.261	0.571

Standard errors in parentheses

^c $p < 0.1$, ^b $p < 0.05$, ^a $p < 0.01$

Appendix

Table A1: Summary statistics

variable	N	mean	sd	max	min
sharecons	308	36.08	15.83	82.56	6.38
texppcons	244	.5684	.2767	1.875	.02701
incmbcons	308	.2987	.4584	1	0
texpcons	244	56414	23773	95976	2633
sharegreen	308	4.319	1.92	12.91	.63
texppgreen	256	.02362	.03915	.2761	0
incmbgreen	308	0	0	0	0
texpgreen	256	2495	4296	30187	0
sharelib	308	30.47	14.89	65.62	2.96
texplib	291	.5041	.282	1.879	.004552
incmblib	308	.3864	.4877	1	0
texplib	291	49412	24107	89127	490
sharendp	308	17.84	11.81	57.18	2.55
texppndp	297	.2152	.251	1.19	0
incmbndp	308	.05519	.2287	1	0
texpndp	297	20606	22747	90617	0
iq	308	.2435	.4299	1	0
ibc	308	.1169	.3218	1	0
iwest	308	.1818	.3863	1	0
immgrp	308	.1774	.1646	.6753	.005264
unemprate	308	7.016	3.325	26.4	3
lowinc	308	11.13	6.08	31.7	0
pop	308	102639	21856	170420	26360
income	308	64022	12220	100281	37519
immgr	308	20087	20313	88445	385
incomep	308	.6575	.2468	2.613	.3852