

# Campaign spending limits and electoral competition in a floating two-party system\*

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## Abstract

This paper deals with the influence of campaign spending on electoral outcomes in the context of the sudden rise and demise of a third party in an otherwise stable two-party system – i.e. a ‘floating two-party system.’ Such a shock to the degree of electoral competition at the electoral district level provides variation out of which the effect of spending on votes can be estimated. To address the endogeneity problems that notoriously plague the estimation of this causal relationship, we propose a novel instrumental variable (IV) strategy. It exploits both the legislated spending limits faced by local candidates and, to address the endogeneity of the probability that these limits bind, shocks to local electoral competition. Our empirical analysis is based on a new dataset of more than 2,000 candidates in the last four provincial elections in Quebec. In contrast with most of the existing literature, our IV results show a positive return to campaign spending for incumbent candidates – but not for non incumbents ones – and for candidates in electorally safe constituencies.

Keywords: Campaign spending, spending limits, vote, electoral competition, Quebec.

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# 1 Introduction

In a provocative paper, Ansolabehere, de Figueiredo and Snyder (2003) wondered why there was so little money in US politics. Their main argument rests on the power of money to reveal political preferences of candidates towards ill-informed voters. Moving in the opposing direction, many countries (e.g. France, Canada, Ireland) have restricted the use of money during electoral campaigns by enacting laws for regulating the nature and amount of money in politics. Beyond the rationale for regulating money in politics, many scholars have investigated the influence of candidates' campaign spending on votes.<sup>1</sup> A recurrent result since Jacobson's (1978) pioneering work indicates that incumbent candidates receive, *ceteris paribus*, fewer votes (if any) than their challengers for the same amount of money spent. This raises a policy puzzle: if money does not disproportionately favour the incumbent, why have countries implemented restrictive campaign spending regulations?

An econometric problem with early estimates of the impact of campaign spending on votes was initially raised by Green and Krasno (1988), highlighting the fact that campaign expenditures are endogenous to voting outcomes.<sup>2</sup> It is generally believed that this issue biases ordinary least squares (OLS) estimates upward for challengers and downward for incumbents (Levitt, 1994). This bias is especially problematic given that the literature generally finds a positive effect of spending on outcomes for challengers and no effect for incumbents. Since Green and Krasno's seminal paper, much of the academic literature has sought valid instruments to account for the endogeneity of campaign spending, with prime candidates being individual characteristics of politicians and lagged variables. Taking into account the endogeneity of candidate spending levels, Gerber (1998) has shown that the marginal effects of incumbent and challenger spending may in fact be roughly equal.<sup>3</sup>

In a recent piece of research closely related to ours (both geographically and methodologically), Milligan and Rekkas (2008) have brought the literature one step ahead by using the peculiarities of Canada's spending limits as instruments for campaign spending. Contrary to the previous literature, they find a positive effect of spending by incumbents and no effect for

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<sup>1</sup>Alternatively, some scholars have developed political economy models to understand how money could affect the content of public policies once candidates are elected. The main theoretical background is derived from the interest group literature where the origin of contributors could be associated with some favorable regulation policies. Campaign contributions are seen as a political investment that could force legislators to favor some groups (Grier and Munger, 1991; Romer and Snyder, 1994; Ansolabehere and Snyder, 1999). In the Canadian context where firms can no longer finance candidates or parties, the interest groups theory does not seem fit to understand the influence of money in politics. Another perspective is offered by Campanate (2011), who formalizes a voting model in which initial inequalities could affect the individual contributions to American parties and empirically shows that inequality increases contributions to Republicans, but not to Democrats.

<sup>2</sup>See also Gerber's (2004) excellent discussion.

<sup>3</sup>In contrast to previous research showing that the incumbent's spending advantage cannot explain high incumbent reelection rates (because of higher marginal returns to challenger spending), Gerber shows that in an average Senate election the incumbent's spending advantage yields a 6% increase in the incumbent's vote share.

challengers after accounting for endogeneity. Higher spending is found to lead to a greater vote share, with an endogeneity-corrected estimate higher than the OLS estimate.<sup>4</sup> They also find that higher spending limits lead to fewer close races, lower voter turnout and fewer candidates running. A limitation of this study stems from its use of two pooled cross-sections, thus abstracting from the time dimension of the data.<sup>5</sup> These Canadian results are narrowly linked to the empirical investigation of the economic logic of spending limits initiated by Stratmann (2006).

While spending limits are exogenously determined and, hence, are natural candidates for an instrumental strategy, the probability that the limit will bind for a given candidate is not exogenous. For example, Milligan and Rekkas (2008) convincingly show that the campaign spending limits were binding mostly for incumbent candidates in the Canadian federal elections of 1997 and 2000. More generally, one would expect senior incumbents to be both more likely to hit the limit (given a better revenue-raising capacity) and to attract more votes (regardless of spending). Conversely, spending limits could also tend to be binding for candidates likely to face the closest elections; as we move away from close races, sure-losers and sure-winners should have a weaker incentive to spend. All in all, the probability that the spending ceiling binds is endogenous to electoral outcomes.

Our empirical strategy is twofold. First, it suggests an alternative to the dominant (single) instrumental strategy by focusing on the determinants of the *distance* between a candidate's campaign spending and the constituency's spending limit. Second, to address the endogeneity of the probability that the spending ceiling binds, we propose an empirical strategy that exploits exogenous shocks to electoral competition, i.e. the rapid increase in the popular support for a third party on the degree of electoral competition faced by candidates.

The empirical application relies on a new dataset on campaign spending by all candidates in four provincial elections in Quebec, allowing us to explicitly account for the dynamics of electoral competition. We exploit the quasi-natural experiment provided by the sudden rise and demise of a third party in Quebec (the Canadian province with the second-largest population) in 2007 and 2008. We will term such a situation a 'floating two-party system.' To our knowledge, no paper has studied the impact of such a change on campaign spending patterns of candidates, and the impact of the latter on voting outcomes. So far, the related literature has relied on estimates of the return to campaign spending based either on two-party systems (chiefly the US) or on multi-party systems (chiefly in Europe). Yet the results from both cases capture the effect of institutional features that inevitably limit their comparability.<sup>6</sup>

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<sup>4</sup>This may suggest that incumbents with (unobservable) lower quality spend more to compensate for their shortcomings.

<sup>5</sup>Identification from cross-sectional data has been fiercely critiqued by Levitt (1994).

<sup>6</sup>To a large extent, scholars have focused their attention on the US – a system where traditionally only two candidates compete. The Canadian, Irish and French cases offer alternative perspectives with some institutional

Section 2 presents the main patterns of political financing and electoral competition in Quebec’s floating two-party system between 1998 and 2008. Section 3 describes our empirical strategy to assess the impact of campaign spending on vote shares. Section 4 states the empirical results, and some concluding remarks can be found in Section 5.

## **2 Elections and campaign finance in Quebec: patterns and institutions**

The analysis is based on election and campaign finance data collected for the 1998, 2003, 2007 and 2008 provincial elections in Quebec. This section describes, in turn, the recent electoral dynamics in the province, the role and regulatory environment of campaign finance in Quebec, and basic correlations between electoral outcomes and campaign spending in our dataset.

### **2.1 Quebec’s floating two-party system**

As is customary in British parliamentary systems, Quebec’s political context is historically characterized by clear-cut bipartism. Today’s two main parties, the Quebec Liberal Party (QLP) and the Parti Québécois (PQ) have sent the two largest delegations of members in the National Assembly after each general election since 1973. Between the 1973 and the 2003 elections, their combined delegations never made up for less than 88.2% of seats, a low mark attained in 1976. Except for 1976, when the PQ first took office, the combined PQ and QLP delegations made up for more than 95% of seats. That number was 96.8% in 2003, with the Action démocratique du Québec (ADQ) holding only four seats in the 125-seat provincial assembly.

In the 2007 election, the ADQ modified the electoral landscape in most electoral districts – including districts only recently believed to be unshakable strongholds for one of the two dominant parties – and managed to finish second with 41 members of the National Assembly (MNAs). They outscored the PQ by five seats to form the Official opposition to the Liberal government. The swift rise of the ADQ (from four to 41 seats) affected both the PQ (down nine seats at 36) and the QLP (down 28 seats at 48), the latter forming the first minority government in the province since the XIX<sup>th</sup> century. Together, the ADQ and the ruling QLP held a record-low 71.2% seat share.

Premier Jean Charest’s minority Liberal government did not last long and a snap election was held the following year. With the 2008 election, the province returned to ‘normal,’ the

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differences – see, e.g., Rekkas (2007), Milligan and Rekkas (2008), Benoit and Marsh (2008), and Foucault and François (2005). For instance, no spending limit exists in Ireland, and the two-round system in France leads candidates to make a strategic use of money depending on whether they expect to be present in the second round or win the election in the first round.

two-party system back in full swing. The number of seats won by the ADQ went down to seven and the combined PQ and QLP delegations totalled 93.6%.

The 2007 election, with its three-party outcome, is thus an anomaly in Quebec's recent history. After the 1970 election, four parties had won seats in the National Assembly but, unlike in 2007, the QLP still managed to clinch to a majority government and the combined delegations of the first two parties made up 82.4% of assembly members. The 1970 election can be seen as a transition between two bipartisan eras, as the PQ replaced the Union nationale, who governed for most of the 1936-1960 period, as Quebec's main rival to the QLP.

What triggered a floating two-party system in Quebec in the second half of the 2000 decade? By 2007, Jean Charest's Liberal government was experiencing record-low popularity levels. The PQ, with an unpopular newly elected leader, could not benefit from the Liberals' weakness. Together, the unpopularity of the two main parties paved the way to the unexpected performance of the ADQ in 2007, leading to the election of many rookie candidates. Forming the Official opposition put the spotlight on these inexperienced MNAs and eventually led to the widespread disappointment with the ADQ crystallized in the outcome of the 2008 election.

## **2.2 Campaign spending: descriptive patterns and financing regulation**

Fundraising and campaign spending in Quebec are closely regulated activities. Financing rules of the political market in Quebec have revolved around two principles: the control of campaign spending and the public financing of political parties and candidates. From 1932 to 1963, no legislation was enacted to control campaign spending. From 1963 to 1977, the Electoral Law defined a restrictive setting to promote both equity and transparency. The basic advances of this law were the individual contribution limit of \$3,000 per voter, the obligation for any party to declare revenues exceeding \$100, the public financing based on a fixed rule of \$0.25 per registered voter and some sanctions against offenders. This law strictly defined campaign spending, allowed advertising spending, implemented spending limits for each constituency and authorized public refund for both candidate and party spending after the election. Finally, this law created the *Directeur général du financement des partis politiques*, a public authority in charge of supervising compliance with the new regulations and acting as the only regulator of political financing in Quebec. Any political organization recognized by this public authority is able to run for elections and to receive public money through two channels: yearly subsidies directly transferred to parties and provisions for any candidate running for provincial elections.

An electoral district's spending limit is publicly defined by the Electoral Law, and updated yearly according to the evolution of its population. This cap is decisive in the candidate's decision to spend because the public refund is based on half of this limit. For instance, in a constituency where the limit is fixed at \$50,000, a candidate is able to receive from the State

exactly \$25,000 if he has spent the maximum authorized (i.e. \$50,000). On average, we observe a strong variance for spending limits in Quebec, ranging from \$17,619 (Iles de la Madeleine) to \$73,226 (Masson).

An important piece of the Quebec regulation concerns the minimum score (15 per cent)<sup>7</sup> required for a candidate to be eligible to the public refund. In essence, it creates two varieties of candidates who compete each other: candidates from the two main parties (which typically share about 90% of the vote) and ‘marginal’ candidates from other parties. The former are likely to receive a public subsidy amounting to 50 per cent of what they spent during the campaign within the constituency spending limit. The latter face a tighter budget constraint since they generally do not qualify for a public refund. This institutional constraint means that a significant change in political competition in Quebec, such as the rise of a third major party (as experienced in 2007 with the ADQ), can lead candidates to revise their spending strategy.

Table *a* displays descriptive statistics about the nature of political competition in Quebec over the 1998-2008 decade by providing an overview of all candidates, distinguishing the number of political parties, the number of candidates and average spending. While the equity principle embodied in the 1977 legislation could have been expected to cause an inflation in the number of candidates (the cost of engaging in the political market being reduced by public financing), the number of political parties remained remarkably stable. On average, 10 political parties competed with each other, presenting an average of five candidates per district. About half of the candidates received at least 15 percent of votes and could then claim public reimbursement for the campaign expenditures. The number of ‘safe constituencies’ (no change in the winning party between the 1981 general election and the election before election *t*) has decreased by about 26 percent between 1998 and 2008, illustrating the electoral success of the third party, namely the ADQ, in affecting even electoral districts previously considered by the two major parties as strongholds. Since 2003, the amount of money in provincial elections (per district) has been decreasing, suggesting that the emergence of a three-party system in Quebec is not necessarily linked with an inflation of campaign spending.<sup>8</sup> Finally, the variability of campaign spending in Quebec (as quantified by the standard deviation) is roughly similar to what is observed at the federal level – see Milligan and Rekkas (2008).

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<sup>7</sup>Initially a 20% threshold of votes was compulsory to claim for public reimbursement. Since 1993, this threshold has been reduced to 15%.

<sup>8</sup>Campaign spending includes four expenditure categories: advertising, transport, services, and representation.

*Table a: Descriptive statistics*

	1998	2003	2007	2008
Political Parties	11	10	12	11
Candidates	657	642	678	649
Safe (loyal) constituencies	53	48	43	39
Candidates per district	5.25	5.13	5.42	5.19
Candidates with score > 15%	261	311	344	291
Spending of candidates with spending > 0 (\$ mean)	31,175	32,763	37,041	33,101
Spending of candidates with spending > 0 (St. Dev.)	15,630	15,861	16,827	15,351
Total spending per district (\$ mean)	75,122.5	105,498.6	91,050.8	79,793.2

Source: Elections Quebec, authors' calculations.

### 2.3 Electoral outcomes and campaign spending: basic correlations

Table *b* describes the three main parties' per-district average electoral scores and campaign spending. Liberal candidates systematically spend more than their PQ and ADQ counterparts. High average spending by Liberal candidates is a constant throughout all four elections, regardless of a candidate's status as an incumbent or not. Interestingly, Liberal spending reached a peak in 2007, the election for which the Liberal average vote share was the lowest (33.7%). PQ spending reached a low in 2008, when the party clinched back the second place lost in 2007. There is some evidence of heterogeneous spending patterns between the PQ and the QLP. Indeed, PQ incumbents spend more on average than PQ non-incumbents, a pattern that is not apparent for the Liberals. Consistent with the party's rising popularity over the 1998-2007 period, both ADQ average scores and spending increased importantly between 1998 and 2007. While spending continued to rise between the 2007 and 2008 elections, the ADQ average electoral score dropped sharply from 29.4% to 15.2%. With the exception of 1998, there is no clear pattern with respect to spending by ADQ incumbents vs. non-incumbents.

Table b: Electoral outcomes and campaign spending (in \$)

	1998		2003		2007		2008	
	Score	Spending	Score	Spending	Score	Spending	Score	Spending
QLP	.431	39,526	.439	41,781	.337	47,593	.433	43,455
Incumbents	.587	38,760	.611	44,423	.399	48,645	.571	43,222
Non-incumbents	.381	39,767	.375	40,689	.283	46,653	.370	43,560
PQ	.438	35,522	.317	37,375	.285	35,196	.348	27,088
Incumbents	.515	37,270	.412	40,841	.392	42,001	.486	39,226
Non-incumbents	.366	33,886	.273	35,239	.248	32,855	.318	24,363
ADQ	.116	3,029	.178	25,317	.294	29,307	.152	33,041
Incumbents	.463	25,125	.572	24,156	.598	37,646	.261	32,272
Non-incumbents	.113	2,068	.175	25,327	.284	28,231	.114	35,347

Source: Elections Quebec, authors calculations.

In general, we should expect incumbent candidates to benefit from their incumbency advantage by reducing their spending, since they are relatively well-known by their electorate and can use other means of communication to anticipate their reelection. In Quebec, incumbent candidates have, on average, spent about 85 per cent of the legal limit, but only 68 per cent in 2008. A significant difference is observed among parties : 26 % for the ADQ party, 70% for the PQ, and 88% for the QLP.

When candidates from all parties are considered (see Figure 1), a clear dichotomy appears in the relationship between spending and vote shares for incumbents vs. non-incumbents (labeled ‘challengers’ in the figure). The positive correlation found between non-incumbent spending and votes indeed disappears for incumbents.

Figure 2 takes a different look at the spending-vote share correlation by highlighting the role played by local spending limits. It plots the distribution of the difference between district spending limits and candidate campaign spending – the ‘limit-spending gap’ – for each election in our sample, according to candidates’ vote shares. An interesting pattern emerges: there exists a consistent negative correlation between the limit-spending gap and a candidate’s electoral score. We observe a regular decreasing pattern regarding the relationship between the difference between the limit-spending gap and the electoral score over the four elections. In general, the more a candidate is close to the spending limit, the higher the score is.

Whether spending causes electoral strength or the reverse is however unclear, an issue that the empirical strategy described in the next section will help clarify.



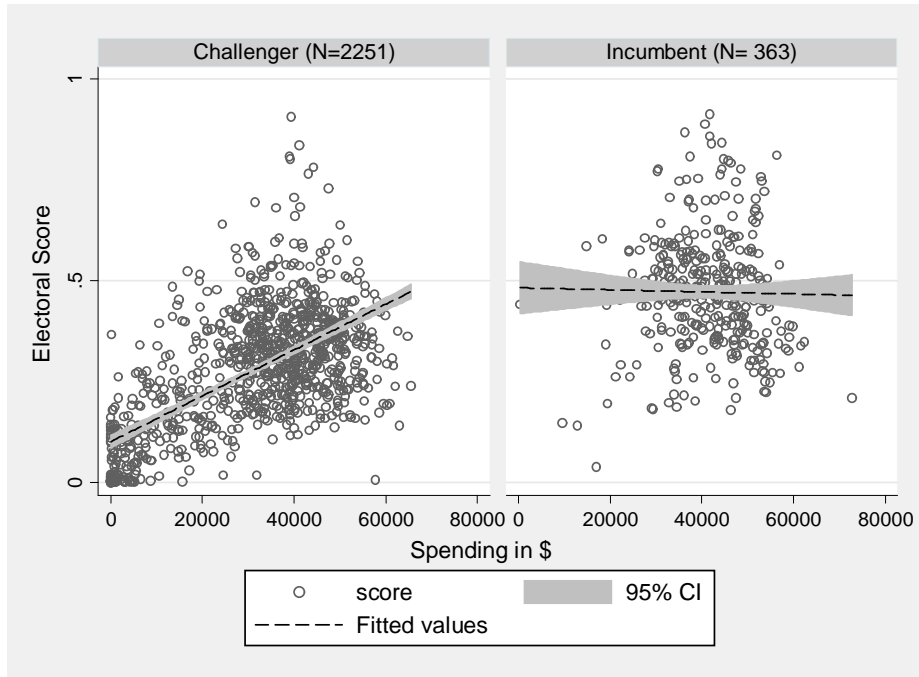


Figure 1: Electoral Score and Campaign Spending

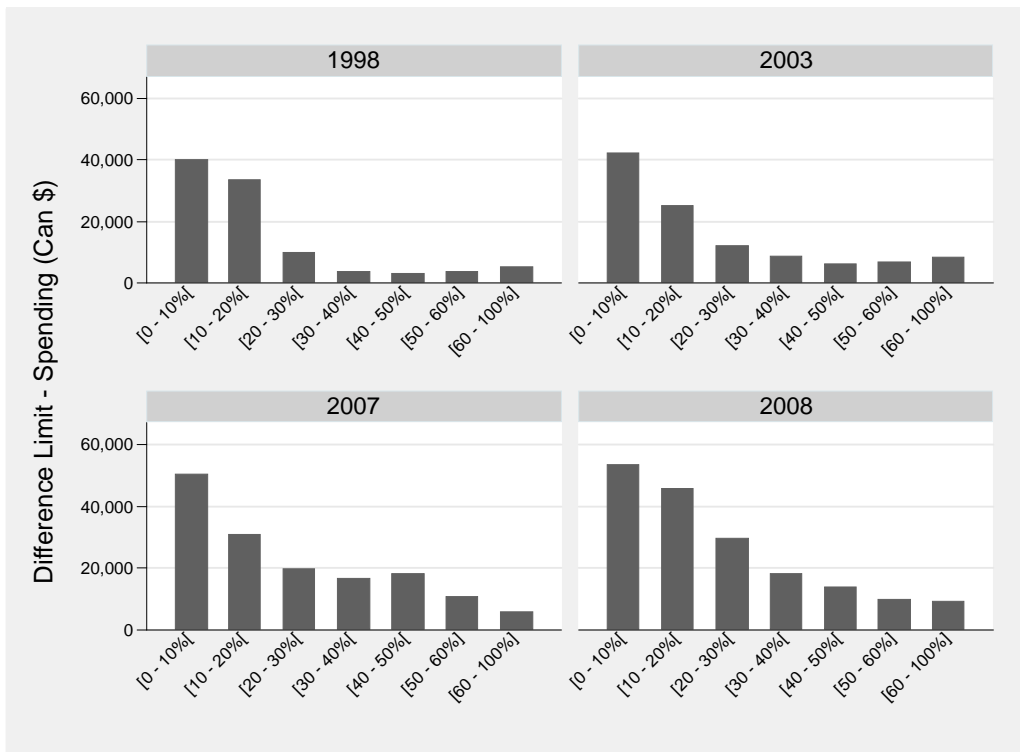


Figure 2: Electoral Score and the Limit-Spending Gap

### 3 Empirical Strategy

Moving beyond bivariate correlations, this section describes our empirical strategy. Before discussing our instruments, we first turn to baseline OLS estimates of the effect of spending on vote shares.

#### 3.1 OLS estimation: baseline results

The first step of our empirical strategy rests on a classical approach where campaign spending acts as an input into the production function of the candidate. We start by regressing a candidate’s electoral output (vote share percentage points) on a series of inputs including candidate and challenger campaign spending, and political capital (incumbency).

The first estimated equation is as follows:

$$\begin{aligned} Vote_{i,t,c} = & cst + \beta_1 Spend_{i,t,c} + \beta_2 Chal\_Spend_{i,t,c} + \beta_3 Incumbency_{i,t,c} \\ & + \beta_4 Party_{i,t,c} + \beta_5 Loyalty_{i,t,c} + \theta_t + \varepsilon_{i,t,c}, \end{aligned} \quad (1)$$

where *Spend* is campaign spending by candidate *i* during election *t* in district *c*, *Chal\_Spend* is campaign spending by its most competitive challenger<sup>9</sup>, *Incumbency* is the incumbent status of candidate *i*, *Party* is a vector of party dummies for the three main political parties in Quebec, *Loyalty* is a characterization of ‘safe’ vs. ‘non safe’ constituencies (see Table *a* above),  $\theta$  is a vector of year effects, and  $\varepsilon$  is an error term.

Table 1 presents single-election regression results pertaining to equation (1), i.e. for  $t = 1998, 2003, 2007, 2008$ . It displays pairs of OLS estimates with the dependent variable in levels and in natural logs. By looking at Figure 3, which plots bivariate fractional-polynomial predictions of spending by electoral score, we may indeed conjecture that the relationship between campaign spending and vote is nonlinear. We observe an inflexion point for challenger candidates when they reach a 42-percent electoral score, and for incumbent candidates when they reach a 37-percent score. This pattern suggests that campaign spending displays decreasing returns. The concave shape for incumbents is consistent with other empirical studies and poses the famous “marginality problem,” as it becomes more costly for an incumbent to win extra votes once a minimum electoral score is reached. For all these reasons, unless otherwise noted, we specify our campaign spending variables in logs.<sup>10</sup>

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<sup>9</sup>Coding of challengers in a district is based on the ranking of parties in the previous election. The candidates of the winning party and of the second-place party in election  $t - 1$  are taken to be each other’s challenger in election  $t$ . The winning party is coded as the challenger of all other candidates in the district.

<sup>10</sup>A consequence of this choice is that candidates who did not spend are excluded.

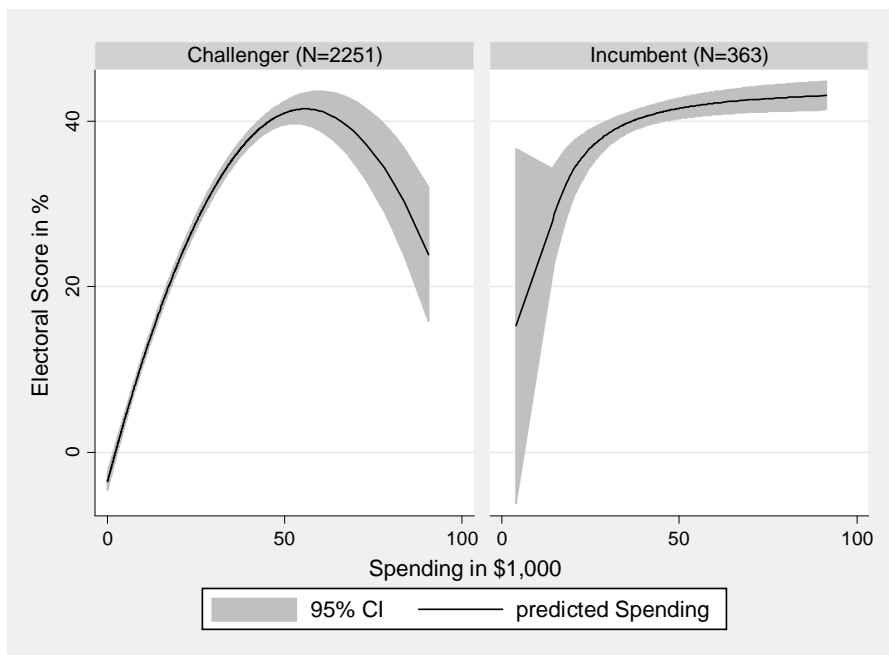


Figure 3: Relation between Votes and Spending

Our OLS estimates confirm the positive relationship between campaign spending and vote for all elections. For example, in 2003, an estimated coefficient of 0.547 with the dependent variable in levels entails that an extra \$1,000 in campaign spending brings an extra 0.547 vote share percentage point, as campaign spending is measured in thousands of dollars. Hence, an increase of \$15,861 (one standard deviation) brings an extra 8.68 percentage points of the vote. This return remains however weaker than the estimated incumbency advantage (15.8), which is strongly significant as is the case for other mature democracies. Another consistent result is the negative coefficients for challenger spending. Campaign spending by the challenger thus affects negatively a candidate’s vote share. We also observe a positive correlation between loyalty and vote shares, driven by incumbent candidates.<sup>11</sup> The success of ADQ candidates in 2007 is appears clearly, with an estimated 23.2-point party effect.

These first results must however be read with caution given the endogeneity issues discussed in the introduction, to which we now return.

<sup>11</sup>We performed estimations with and without the *Loyalty* variable (available upon request), which captures the advantage that incumbent candidates should receive from running in loyal constituencies. For every election in our sample, about half of the Quebec constituencies did not experience electoral change. What is surprising is that the inclusion or not of the loyalty variable does not strongly affect the relationship between spending and vote shares. For more on the role played by local partisan loyalties in Quebec politics, see Joanis (2011).

## 3.2 IV strategy

The above single-year OLS approach has two key weaknesses: First, it does not factor in the institutional constraints with which candidates have to comply, namely the spending limit enforced in every constituency. Higher spending is allowed in larger, more populated districts. Second, it does not deal with the potential endogeneity of campaign spending, chiefly to the anticipated competitiveness of the election. Indeed, the decision to spend in a context where only one challenger is expected (1998 and 2003 elections) is not similar to a context where two competitive challengers will run to be elected (2007 and 2008 elections). These two lines of arguments (spending limits and political competition) are at the heart of our instrumental variable strategy.

### 3.2.1 Spending limits

To account for the district-level spending limits, we transform our main independent variables as the difference between a candidate's spending and the limit:  $Spendlim_{i,t,c} = Spend_{i,t,c} - Limit_{t,c}$  and  $Chal\_Spendlim_{i,t,c} = Chal\_Spend_{i,t,c} - Limit_{t,c}$ . This modelling approach will allow us to reason in terms of the likelihood that a candidate reaches the spending limit. But first and foremost, the limit is effectively introduced in the vote share equation as an additional control. Furthermore, we pool our four-election sample to exploit the time dimension of our dataset. We estimate the following modified vote share regressions, treating each of the 125 constituencies as a cluster and interacting the party and year dummies:

$$\begin{aligned} Vote_{i,t,c} = & cst + \beta_1 Spendlim_{i,t,c} + \beta_2 Chal\_Spendlim_{i,t,c} + \beta_3 Incumbency_{i,t,c} \quad (2) \\ & + \beta_4 Party_{i,t,c} + \beta_4' Party_{i,t,c} \times \theta_t + \beta_5 Loyalty_{i,t,c} + \theta_t + \varepsilon_{i,t,c} \end{aligned}$$

In the Quebec context, controlling for the spending limit is especially important given the role played by the limit in the revenues of a candidate and his party. Indeed, candidates may receive half of the spending limit from the public authority in charge of elections at the beginning of the campaign. Consequently, it means that a candidate who expects to obtain a bad (but at least superior to 15 percent) score can keep the advanced public funds in anticipation of a better use in the next election. The management of these public resources could lead some parties to allocate extra resources to new or weak candidates in order to receive the 50 percent counterpart from the State. Such a strategy can easily be implemented as political parties are free to transfer funds raised by popular candidates or candidates elected in safe constituencies to candidates running in contested constituencies.

### 3.2.2 Endogenizing the spending-limit difference

The main challenge in our 2SLS estimation is to find viable instruments for explaining the campaign spending. After controlling for the local spending limits, we now turn to political competition as a determinant of the likelihood that a candidate will reach his spending limit. Indeed, we conjecture that the spending limit is not fully satisfying as an instrument as only a selected subgroup of candidates are likely to be affected by the limit – e.g. strong incumbents, senior candidates. For the last Quebec elections, a quasi-natural experiment enables us to analyze how the emergence of a third party, the ADQ, during the 2007 campaign has modified the use of money. We build a measure of electoral progress for this party, labeled  $ADQgap$ , which is the difference between the ADQ score in election  $t - 1$  and election  $t - 2$ . This variable captures the (essentially exogenous) threat posed by ADQ candidates in a given district. Faced with such a threat, other candidates should be expected to spend more (closer to the limit) given the fiercer anticipated political competition.

Two other (potential) instruments are included in the analysis: the number of registered voters (the prime determinant of a district’s spending limit) and a party’s local score in the previous election. Consider now the three-equation system where both a candidate’s own limit-spending gap and his direct challenger’s are instrumented by three instruments, i.e. the progress of the ADQ score ( $ADQgap$ ), the individual lagged score ( $Score_{t-1}$ ) and the number of registered voters ( $Voters$ ). We have the following estimation:

$$\begin{cases} Vote_{i,t,c} = cst + \beta_1 Spendlim_{i,t,c} + \beta_2 Chal\_Spendlim_{i,t,c} + \beta_3 Incumbency_{i,t,c} \\ \quad + \beta_4 Party_{i,t,c} + \beta'_4 Party_{i,t,c} \times \theta_t + \beta_5 Loyalty_{i,t,c} + \theta_t + \varepsilon_{i,t,c} \\ Spendlim_{i,t,c} = cst + \gamma_1 ADQgap_{t,c} + \gamma_2 Score_{i,t-1,c} + \gamma_3 Voters_{t,c} + \gamma_4 \mathbf{X} + \theta_t + \mu_{i,t,c}^1 \end{cases} \quad (3)$$

where  $\mathbf{X}$  is a vector of the remaining exogenous variables of the model. The second equation corresponds to the first stage estimation (see Table 2 for first-stage results). Again, all estimations have been clustered at the constituency level.<sup>12</sup>

Usual tests have been performed to test the endogeneity bias and the over-identifying restrictions. Once verified that  $\varepsilon$  and  $\hat{\mu}$  are correlated (i.e.  $Spendlim$  is indeed endogenous), we test the quality of our instruments by checking that  $cov(Spendlim_i, \varepsilon) = 0$  and  $cov(Spendlim_i, ADQgap) \neq 0$ . The minimum eigenvalue statistic combined with the F statistic reject the null hypothesis that our instruments are weak. A second characterization of

<sup>12</sup>Given the structure of our dataset, we are confident that district-level clusters provide a better way to treat multiple observations from the same district than fixed effects.

potential weak instruments consists in displaying a rejection rate from a 2SLS Wald test or a limited information maximum likelihood (LIML) Wald test. Both tests inform us that we can again reject the null hypothesis of weak instruments meaning that we can tolerate a relative bias of 5% and less. The over-identifying restriction is tested through a Sargan test to verify if instruments are uncorrelated with the error term. In fact, this test consists in verifying whether our instruments are themselves potentially endogenous<sup>13</sup>. The specification with our instrument  $Score_{t-1}$  does not succeed in validating the exogeneity condition. Consequently, we have excluded this instrument for the subsequent 2SLS estimations.

## 4 IV results

This section discusses our IV results, starting with those of the first stage equations.

### 4.1 First-stage results

Table 2 presents the first-stage results. Our main instrument, the lagged first-differenced ADQ score, is consistent with our expectations. We find a positive sign for all specifications, confirming that the more the ADQ party has increased its score, the more (all) candidates have reacted by increasing their spending (i.e. converging towards the legal limit). The estimated coefficient is significant in all specifications but one, i.e. non safe constituencies. The number of registered voters, our second instrument, is highly significant in all samples suggesting that high-populated constituencies reduce the odds of spending close to the limit.<sup>14</sup> Incumbency is a strong predictor of spending as incumbent candidates are likely to spend closer to the limit, an indication that the cost of spending is not the same for incumbents and their challengers.<sup>15</sup> Other controls for this first-stage were not at the core of our argument but provide interesting results for parties. For example, it is not surprising to find that the wealthiest party, the Quebec Liberal Party, encourages its candidates to spend closer to the limit since the cost of spending is likely to be lower for its candidates due to the party's capacity for raising funds.

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<sup>13</sup>We perform successively the Sargan test by assuming that the errors are i.i.d. and then by requesting heteroskedasticity-robust standard errors.

<sup>14</sup>This effect could be linked to the urban/rural cleavage that may underly this variable. Most of urban constituencies gather a high level of registered voters and favor economies of scale for reaching voters through communication means (which account for about 50 per cent of overall spending).

<sup>15</sup>This result tends to confirm one of the peculiarities of the public financing system where incumbent candidates can raise funds more easily than challengers and then may spend without searching necessarily new voters. Such a pattern is linked to the famous marginality problem whose consequences make incumbent spending less effective than the challenger spending (Benoit & Marsh, 2008).

## 4.2 Second-stage results

Tables 3 and 4 display our main (second-stage) results by comparing five pairs of OLS vs. 2SLS estimates. In all 2SLS specifications, a candidate’s own spending and incumbency present positive effects. We thus find that the more candidates converge towards the spending limit, the higher the vote share is. An exception to this result concerns two subsamples of our population: non incumbent candidates and non safe constituencies. Somewhat surprisingly, candidates running for election in non safe constituencies and non incumbent candidates tend to increase their spending to win according to the OLS point estimate, but this result is not statistically significant in 2SLS results.

For the full sample, the magnitude of the IV spending coefficient is 36% lower than the OLS coefficient. A similar decline (27%) is observed for the subsample of safe constituencies. However, these declines mask opposite trends for incumbents and non-incumbents: the OLS estimate for non-incumbents drops from a strongly significant 3.06 to a non-significant .289, while the opposite is true for incumbents. Challenger spending has the expected effect on votes across specifications (OLS and IV).

## 5 Discussion and conclusion

All in all, second-stage results provide evidence for effective campaign spending in terms of vote share for the full sample, incumbent candidates and safe constituencies. Such a strategic use of campaign spending tend to confirm what scholars have emphasized in the literature; nevertheless, our results – and those of Milligan and Rekkas (2008) to which they lend robustness – mitigate the supposed positive and stronger effect of challenger spending on vote share. Our first-stage results suggest that the more candidates were threatened by a third party (ADQ), the more they reacted by increasing their spending close to the spending limit, especially in safe constituencies. Furthermore, we have shown that the incumbency advantage is not only a strong predictor of the electoral score but also a significant determinant of the high level of spending, especially for candidates reaching the spending limit.<sup>16</sup>

Why do we observe that campaign spending has a stronger impact for incumbents and in safe constituencies? While this finding may appear counter-intuitive, it is consistent with the predictions of Snyder’s (1989) theoretical model which highlights that when parties maximize their probability of winning a majority (rather than their number of seats won) they might devote more resources to safe seats. Indeed, a party that maximizes its probability of winning a majority of seats, a reasonable objective in a Westminster-style parliamentary system such as Quebec’s, should be expected to concentrate resources in a group of districts likely to be

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<sup>16</sup>A similar point has been made by Gerber (2004) in the US context.

pivotal in securing the majority. In such a context, a previously safe district subject to the sudden threat of, say, a new party becomes more likely to be pivotal. It should thus attract more campaign resources.

On the policy front, our results may be seen as a justification for spending limits. Indeed, if spending is more effective at winning votes for incumbents and candidates in safe constituencies, spending limits may indeed contribute to a levelling of the playing field and to a more competitive political market.



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**Table 1. OLS estimates (vote share regressions)**

	1998		2003		2007		2008	
	Levels	Logs	Levels	Logs	Levels	Logs	Levels	Logs
Spending (levels or logs)	.234** (.109)	2.09*** (.663)	.547*** (.0444)	4.64*** (.607)	.302*** (.0553)	4.88*** (.806)	.266*** (.0431)	3.16*** (.742)
Challenger spending (levels or logs)	-.12* (.0653)	-14.4*** (3.38)	-.332*** (.0585)	-3.81* (2.24)	-.14*** (.04)	-11.8*** (1.74)	-.112*** (.0231)	-5.16*** (1.54)
Incumbent	16.6*** (1.8)	15.5*** (1.61)	15.8*** (1.54)	16.8*** (1.62)	11.2*** (1.49)	10.5*** (1.14)	12.6*** (1.29)	12.4*** (1.91)
Loyalty	.462 (.31)	1.31* (.787)	1.65*** (.477)	1.34* (.679)	1.38*** (.364)	3.79*** (.952)	1.15*** (.413)	-.195 (1.09)
PQ party	27.2*** (4.18)	27.9*** (3.93)	4.36** (1.97)	3.24 (2.96)	11.8*** (2.15)	4.32 (3.63)	22.1*** (1.68)	19.5*** (3.02)
ADQ party	10.6*** (.463)	14.4*** (1.57)	2.5* (1.45)	-2.32 (2.8)	23.1*** (1.18)	20.9*** (3.72)	6.99*** (.768)	4.79 (3.66)
QLP party	28.5*** (4.35)	28.6*** (3.53)	14*** (2.3)	14.6*** (3.28)	9.72*** (2.82)	.253 (3.89)	23.4*** (1.99)	22.4*** (3.67)
Constant	4.96** (2.49)	53.2*** (12.8)	15.1*** (2.54)	21** (8.54)	9.09*** (1.82)	48.6*** (7)	6.6*** (.891)	20.9*** (6.07)
Observations	631	283	639	392	678	296	649	234
Adjusted R-squared	0.879	0.717	0.853	0.712	0.751	0.671	0.844	0.630

Clustered standard errors in parentheses

\* p<0.10 \*\* p<0.05 \*\*\* p<0.01

Source: Elections Quebec data

**Table 2. First-stage estimates (spending regressions)**

	(1)	(2)	(3)	(4)	(5)
	All candidates	Incumbents	Non incumbents	Safe Const.	Non safe Const.
Lagged ADQ score growth	.00897*** (.00327)	.0205* (.0121)	.00536* (.0028)	.0121** (.00481)	.00593 (.00424)
Registered voters	-.000036*** (3.77e-06)	-.0000447*** (.0000104)	-.0000331*** (3.32e-06)	-.0000451*** (6.37e-06)	-.000033*** (4.44e-06)
Chal. spending (ln of diff. with limit)	-.0151 (.0197)	-.0946* (.0505)	.00145 (.0169)	.00491 (.033)	-.0173 (.0245)
Incumbent	.482*** (.0996)			.535*** (.178)	.451*** (.128)
QLP	3.52*** (.226)	.688* (.374)	3.86*** (.251)	2.95*** (.315)	3.89*** (.307)
2003*QLP	-1.74*** (.219)	-.583** (.283)	-2.02*** (.251)	-1.48*** (.31)	-1.95*** (.302)
2007*QLP	-.4* (.234)	.613** (.299)	-.502* (.292)	-.104 (.335)	-.628* (.33)
2008*QLP	-1.71*** (.224)	-.66* (.348)	-1.89*** (.251)	-1.41*** (.304)	-1.96*** (.308)
ADQ	.0125 (.0229)	-2.14*** (.725)	.0373** (.0179)	-.0371 (.0407)	.0439 (.031)
2003*ADQ	.865*** (.0744)	1.1 (.798)	.844*** (.0731)	.499*** (.0883)	1.08*** (.103)
2007*ADQ	.222*** (.0614)	2.11** (.943)	.155*** (.0491)	.07 (.0726)	.31*** (.0875)
2008*ADQ	-.0988 (.0706)	.937 (.694)	-.0352 (.0454)	-.0799* (.0474)	.196* (.101)
PQ	2.45*** (.204)	.52 (.335)	2.6*** (.313)	2.17*** (.257)	2.65*** (.303)
2003*PQ	-.92*** (.18)	-.579*** (.217)	-1.1*** (.288)	-.829*** (.221)	-1.01*** (.272)
2007*PQ	-.672*** (.219)	-.0721 (.379)	-.933*** (.334)	-.591* (.33)	-.751** (.309)
2008*PQ	-1.59*** (.213)	-.506 (.418)	-1.88*** (.324)	-1.35*** (.285)	-1.76*** (.313)
Constant	-9.07*** (.178)	-5.97*** (.652)	-9.32*** (.159)	-8.81*** (.349)	-9.18*** (.199)
Observations	2287	323	1964	855	1432
Adjusted R-squared	0.654	0.303	0.667	0.673	0.654

Clustered standard errors in parentheses

\* p<0.10

\*\* p<0.05

\*\*\* p<0.01

Source: Elections Quebec data

**Table 3. 2SLS results (vote share regressions): all candidates, incumbents and non incumbents**

	All candidates		Incumbents		Non incumbents	
	(1) OLS	(2) 2SLS	(3) OLS	(4) 2SLS	(5) OLS	(6) 2SLS
Spending (ln of diff. with limit)	2.17***	1.38***	-.0282	3.53*	3.06***	.289
Chal. spending (ln of diff. with limit)	-.74***	-.735***	-1.78***	-2.52***	-.518***	-.389**
Incumbent	16.8***	17***				
QLP	28***	30.6***	16.5	-2.16	23.1***	33.8***
2003*QLP	3.12**	1.76	.18	1.83	4.73***	-.904
2007*QLP	-12.2***	-12.5***	-20.6***	-23.2***	-7.39***	-8.84***
2008*QLP	2.04*	.732	-5.82**	-4.64	4.76**	-.47
ADQ	9.04***	9.59***	13.1	.447	8.74***	9.47***
2003*ADQ	3.7***	3.69***	2.33	1.39	3.21***	4.92***
2007*ADQ	16.9***	16.3***	6.66***	1.42	16.7***	16.2***
2008*ADQ	-1.79**	-2.42***	-31.1***	-31.2***	-.149	-.889
PQ	28***	29.6***	11.9	-8.56	26.6***	35***
2003*PQ	-9.32***	-10.1***	-13.6***	-10***	-8.15***	-12.7***
2007*PQ	-10.1***	-10.5***	-13.4***	-10.8***	-9.15***	-13.2***
2008*PQ	-1.73	-2.75**	-8.73***	-5.43*	-.00735	-6.52**
Constant	19.8***	11.5***	27.3**	68.4***	31.2***	2.53
Observations	2575	2286	356	323	2219	1963
Adjusted R-squared	0.792	0.778	0.473	0.417	0.743	0.710

Clustered standard errors in parentheses

\* p<0.10

\*\* p<0.05

\*\*\* p<0.01

Instruments: Lagged ADQ score growth, registered voters.

**Table 4. 2SLS results (vote share regressions): safe and non safe constituencies**

	Safe constituencies		Non safe constituencies	
	(1) OLS	(2) 2SLS	(3) OLS	(4) 2SLS
Spending (ln of diff. with limit)	3.46***	2.53***	1.59***	.834
Chal. spending (ln of diff. with limit)	-1.37***	-1.5***	-.399**	-.37*
Incumbent	19.8***	20***	14.6***	14.9***
QLP	25.4***	27.9***	28.3***	31.2***
2003*QLP	1.08	-.107	5***	3.46**
2007*QLP	-7.38***	-7.34***	-13***	-13.5***
2008*QLP	1.31	.0995	3.12**	1.61
ADQ	7.1***	7.11***	10.5***	11.3***
2003*ADQ	1	1.28	5.37***	5.28***
2007*ADQ	12.9***	12.8***	19.1***	18.3***
2008*ADQ	-2.11**	-2.4***	-.85	-1.69
PQ	23.1***	24.9***	30.9***	33***
2003*PQ	-7.95***	-8.51***	-9.95***	-11.2***
2007*PQ	-8.14***	-8.42***	-11.3***	-12.2***
2008*PQ	-2.96	-3.64*	-1.77	-3.4*
Constant	29.2***	18.1***	16***	8.36*
Observations	988	854	1587	1432
Adjusted R-squared	0.806	0.790	0.805	0.794

Clustered standard errors in parentheses

\* p<0.10

\*\* p<0.05

\*\*\* p<0.01

Instruments: Lagged ADQ score growth, registered voters.