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"Campaign spending and voters' turnout In Canada"

Gklezakou Kyriaki

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Supervisor: *Theodore Panagiotidis*

Assistant Professor

ABSTRACT

In this research, we examine which factors, among various political and socioeconomic factors, can affect voters' turnout, how much and in which direction. Among them, campaign spending is considered to be one of the most important, because it is connected to candidates' choice of strategy. The analysis shows that campaign spending does affect the turnout and so, galvanize people to participate in elections, the process that characterize Democracy.

Table of contents

Tables & Figures

1. INTRODUCTION

Elections are the fundamental process of democracy, the polity at which the key element is the active participation of the citizens in civic life. What mobilize people to participate? Which factors affect voters' turnout? Does money matter? Many researchers have focused on trying to find out and measure the size of these impacts on electoral participation.

In this research are examined some socioeconomic and political factors and how much they can explain voters' turnout of Canada.

The socioeconomic factors that are included are: demographic structure, education, income, unemployment rate, population density, income inequality, whereas the political factors are campaign spending, campaign limits, closeness and incumbency, number of electors. Among these factors, campaign spendings are used to be considered as one of the most important, because it involves money and it reflects candidates' strategies.

Alan S. Gerber ("Does Campaign Spending Work?" Yale University, 2004) considers campaign strategy analogous to an insurance purchase, meaning that the decision that candidate makes is similar to the decision that an individual makes in the face of uncertainty. Generally, campaign spending is an investment of political parties and candidates and the benefit is the share of the electors that will vote them. The investments provide all the necessary information to the electorate and finance the creative and media elements of advertising. The creative element is the cost of producing messages, whereas the media element is the cost of sending messages.

So campaign spending is one of the most popular factors that is analysed by researchers who are interested in voters' turnout. The common problem that all the essayers face is what is called "Jacobson effect". This definition is used by Cox and Thies ("How much does Money Matter? "Buying" votes in Japan, 1967-1990" University of California, 2000), to describe what Gary C. Jacobson ("The American Political Science Review" Trinity College, 1978) early recognized and is referring to the problem of endogeneity. Campaign spending affects elections' results, but also, campaign spending is affected by expectations for the elections' results. For example, when an incumbent, who seeks re-election, face challenger, who is not taken for a

strong opponent, the incumbent will not spend much for his campaign. But, when he is facing an appreciable opponent, he is feeling threatened, and he is going to expend much more.

Mainly, the ways that was used to deal with this difficulty are instrumental variables, two-stage models, or inserting more and more variables into the model. The argument still exists about the solution of the problem, and as Gary C. Jacobson (Measuring Campaign Spending Effects in U.S. House Elections, University of Michigan, 2006) claims, it's unsettling for those who are hoping for scientific progress, the fact that such matters still exist, after so much research. In this study, firstly is explicated the political and electoral system of Canada and the regulations concerning campaign spending and limits. Following, are mentioned findings of other similar articles that tried to examine the factors that affect voters' turnout either by converting votes from other candidates or by activating more citizens to vote. Then, fixed effects panel data techniques is used to identify the factors of voters' mobilization.

2. POLITICAL AND ELECTORAL STRUCTURE OF CANADA

2.1 Political System of Canada

Constitutional Monarchy is called the political system that exists in Canada and it is based on that of United Kingdom. It's structure consist of the Queen of Canada, who is officially represented by the Governor General, the Senate and the House of Commons:

-The Senate consists of 105 seats. The members of the Senate are seated by the Governor General, on the recommendation of the Prime Minister

-The House of Commons is composed by 338 seats. The members of House of Commons are elected by Canadian citizens in general elections and these representatives are called Members of Parliament (MPs)

The government originates from the House of Common. The political party with the largest number of elected candidates will form the Government, and the leader of this political party will be Prime Minister. In order to remain government, must preserve the confidence of the House of Commons. The second party is the leader of the Official Opposition. If the first party does not manage to have the majority of seats (50% of the seats plus one) could govern with the cooperation of one or more other parties. The Prime Minister will choose members of the House of Common (usually, from his or her party) to be Cabinet ministers and administrate various government departments.

Therefore, according to the principals of Constitutional Monarchy, the Queen rules but not govern.

The Canadian Constitution consists of unwritten conventions, written Acts and judicial decisions that together form the political system and define the authorities and powers of the three levels of government: federal, provincial and territorial. Each one of them is responsible of its own elections.

2.2 Elections Canada

One of the most important thing concerning elections in Canada, is that it is established on independent Agency to administer all aspects of all kinds of elections: federal, General, by-elections and referendums. The Agency is called the office of the Chief Electoral Officer of Canada or Elections Canada. Their role is to ensure Canadians' democratic right to vote or to be a candidate. Based on the information from Elections Canada's formal website, among their valuable responsibilities are:

- ✓ making sure that electors have access to the electoral process through public education and information programs, as well as accessible physical facilities
- ✓ providing technical, financial and administrative support to the independent commissions that periodically readjust electoral district boundaries
- ✓ administrating the legislated controls on the financing sources and election expenses of all political entities and examining and disclosing their financial reports including posting them on the official page of Elections Canada
- ✓ reimbursing the election expenses of candidates and parties according to formulas set out in the Canada Elections Act
- ✓ appointing and training returning officers and ensuring that they provide competent and efficient process in each electoral district.

Elections Canada operates under the laws of Canada, Elections Act, Referendum Act and the Electoral Boundaries Readjustment Act, but it's also subject to all laws that apply to federal organizations including the Constitutional Act, the Public Service Employment Act, the Privacy Act, the Access to information Act, the Canadian Human Rights Act and the Official Languages Act. Elections Canada reports directly to the Parliament and thus, is completely independent of the Government and political parties. Moreover, is responsible to ensure that all election officers are politically neutral and non-partisan in all aspects of their work. Of course, the Chief Electoral Officer, given the nature of his work, is the only citizen who is not allowed to vote in general elections.

Elections Canada's funding comes from an annual appropriation, which covers the salaries of the permanent employees, and from a statutory authority contained in the Canada Elections Act, Referendum Act and the Electoral Boundaries Readjustment

Act. The latter covers all other expenditures such as preparing and conducting electoral events, continuing public information and education programs etc.

2.3 Electoral System of Canada

Electoral System of Canada is commonly known as “first-past-the-post” system, and it is a “single-member” plurality. Each political party has only one candidate in every district and each candidate can be a nominee to only one district. In every district, the candidate who wins the majority of votes represents his district in the House of Common, and the majority is not obligatory to be 50% of the votes. It is worthy to be mentioned that for citizens who are not be able to go to vote, Elections Canada gives the possibility of voting by e-mail or with a mobile pall, while they are visited by an election officer.

Canada Elections Act defines that the General Elections will take place every four years on the third Monday of October, except for some exceptions like the resignation of the Prime Minister. Voting in Canada is by secret ballot. Intimidation, bribery, as well as, any attempt to reveal how en elector has voted or is going to vote, is an offence under the Canada Elections Act. The privacy of Electors is enforced in all aspects of electoral administration. For example, the law imposes controls on who can obtain personal information and how it can be used, and it sets out penalties for non-compliance.

2.4 Campaign Spending Limits

The financing of the political system in Canada is transparent. All the contributions that all entities receive or spent are made under certain conditions which are defined by Canada Elections Act. According to Canada Election Act, an election expense is any cost incurred, or non-monetary contribution received by a registered party or a candidate that is used to directly promote or oppose a registered party, its leader or a candidate during an election period.

Such expenses are subject to limits for both candidates and political parties. They exist mainly for transparency and fairness purposes, and to reduce the possibility of unaccepted influence. They believe that limits of contributions and expenses promote the proper functioning of a democratic society, by preserving a level playing field that attracts more participants, diversities political discourse, activate people to vote.

Every party is allowed to spend $ 0.70 for every voter in a riding, where it has nominated a candidate. So, if a party has a candidate in every riding, and there are 338 districts, the spending limit is $21,025,793.23.

May 2, 2011 Elections	
Party	***Limit ($)***
Liberal	21,025,793,23
NDP	21,025,793,23
Conservatives	20,995,088,91
Green Party	20,764,344,60
Bloc Quebecois	5,737,817,88
Animal Alliance Enviroment Voters	467,969,04
Marijuana Party	336,676,42
Western Block Party	333,954,75
United Party of Canada	241,406,53
First people National Party of Canada	62,702,06

There are, also, established spending limits for candidates' local campaigns, which depend on the number of voters that live in the district. Therefore, for every elector of a riding with less than 15000 voters, a candidate is given $2.07. For each voter of the next 10000, in the riding that has between 15000 and 20000 voters, is given $1.04 and $0.52 is given for every voter for the remaining electors, in every riding that has over 20000 voters. Moreover, there is a bonus for the parties in spending limits which is determined by the population density and it is $0.31 for every square kilometer in the district.

Limit = f(electors) + Bonus ***(α)***

f(electors) = $2.07 x min(15000,electors) + $1.04 x min(10000,max(0,electors-15000)) + $0.52 x max(0,electors – 25000) ***(β)***

Bonus + min(0.25 x f(electors),$0.31 x Area) ***(γ)***

All political entities are obliged to report their expenses and contributions to the Chief Electoral Officer, and those reports are published in the official page of Elections Canada. The reports must include name and address of anyone contributing more than $200.

Candidates and political parties become eligible for reimbursement under certain requirements. If a candidate wins at least 10% of the valid votes in his or her electoral district, and has submit the report of financing, receives a reimbursement of election and personal expenses paid up to a maximum of 60% of the election expenses limit established for the electoral district. If a political party report their financing and get at least 2% of the valid votes cast nationally or 5% of the valid votes cast in electoral districts, where they endorsed candidates, they can receive a reimbursement of 50% of their paid election expenses for general elections.

There are two interesting researches, concerning the effects of campaign spending limits. The first is *Campaign Spending Limits, Incumbent Spending, and Election Outcomes by* K. Milligan and M. Rekkas, November 2007. According to them, spending limits affects mostly incumbent candidates. Moreover, they found that spending limits lead to less close races, less voter turnout and fewer candidates running and with regard to voters' welfare, limits lead to greater electoral participation and more choices, considering that there will be more candidates. The second is *Campaign Spending Limits and Political Advertising by D. Soberman, L. Sadoulet, October 2007.* They link campaign spending limits to political strategies. When the limits are high, parties choose broad campaigns. Their target groups are those who are traditional supporters of their party and not those who support opposition. In contrary, when spending limits are low, parties follow aggressive strategies, and not offensive, end they direct their interest to the supporters of the opposing party.

3. LITERATURE REVIEW

Alan S. Gerber in 2004 tries to improve if campaign spending works and implies that field experiments provide evidence and suggest new theory. He reports the results of several field experiments in order to measure campaign effects on partisan contests. He proves theoretically for the U.S. elections that incumbents' campaigns fail to increase incumbents' vote share, but challengers' campaigns increase challengers' vote share. He also proves that house elections incumbent spending may increase the probability of incumbent's victory.

He insists that there are certain conditions under which theoretical findings hold, but they must be analyzed more rigorously. Gerber also implies that partisan campaigns should be studied by using field experiments, because it is possible to find campaigns that are interested in participating. In the end, he concludes that field experiments can provide theoretical advances.

Gary C. Jacobson in one of his researches tries to figure out and measure the campaign spending effects in U.S. House elections. He agrees that campaign spending effects do matter, but he tries to prove how they matter and for that reason should new strategies be used. He implies that campaign spending effects differ for challengers and incumbents. In this research, we see that heavy spending of incumbents is a sign of electoral weakness, but heavy spending of challengers is a sign of electoral strength, but that does not mean that incumbents should not spend money on their campaigns.

In order to make that clear he tries to explain that the combination of time and campaign money affect the voters' knowledge of candidates. He uses the pre-election and postelection periods to prove this. The pre-election results show that both incumbents' and challengers; campaign spending have positive effects on probability that a voter will recall the candidate's name when asked or will recognize it in a list before elections and the effect becomes more positive as the Elections' day arrives. The postelection results for recall or recognition are different, they have no effect for the incumbents but only for the challengers. He also suggests that the study of campaign effects should content both cross-section and panel components. In conclusion, his suggestion is to use evidence on changes over time in knowledge and

evaluation of House candidates as leverage on the question of how campaign spending affects the election results.

Kenneth Benoit and Michael Marsh are the writers of the article "Campaign spending in the local Government elections of 1999". This article tries to explore whether the campaign spending had impact on the elections outcomes a candidates' successes in Ireland in 1999. In 1999, in Ireland the candidates were for the first time obliged to declare to their public the amount of money they spent on campaigns. This research was based on these data. Firstly, the writers characterize their data and they are making some points such as that some parties spend more money than other e.g. the Democrats, incumbents spend also more money on their campaigns, the amount of campaign spending is also based in which region is each council, for instance in Dublin there is the spending is higher. In general, they claimed that candidates spend their money based on their funds, on the demand that there is from the voters and population of each candidate's region.

They conclude that spending does matter and particularly in local elections. They used OLS in order to prove it and they were interested in both the coefficient for spending, which tells how much spending matters and in the coefficient for the interaction term showing spending × incumbency, which tells whether the spending effect is different for challengers from that for incumbents. They proved that Spending not only matters generally, but outspending one's own party rivals is an important method of outranking them in the intra-party preference rankings. Furthermore, they wanted to see the spending effects on the probability of victory. In order to achieve this they used the relationship between the probability of winning a seat to a candidate's share of constituency spending for the all values of spending share actually observed in the elections. For challengers and incumbents, regardless of spending, incumbents have a much higher probability of re-election. The interesting feature once again is the responsiveness of the probability of winning at very low levels of change in spending share: moving from two per cent to five per cent of the spending basically doubles a challenger's chances of winning a seat.

The same writers, *Kenneth Benoit and Michael Marsh*, in 2003 wrote another article "FOR A FEW EUROS MORE-Campaign Spending Effects in the Irish Local Elections of 1999", which examines the examines spending effects in the Irish local

elections of 1999 using Single Transferable Vote (STV) with district magnitudes between 3 and 7 seats, contested by a median of 10 candidates in each district. In Ireland government and local authorities have small power on the distribution of money, but they have power on environmental issues. Prior to the 1999 local elections, the financing of local elections in Ireland had no rules, but since then candidates must disclose details of expenditure incurred in the time between the government issuing the polling day order and the actual polling day (about four weeks). The problem of spending effects is the endogeneity bias, the problem that while votes are influenced by spending, candidates (or parties) also make decisions to spend based on their expectations about the votes. In order to avoid this problem the authors use two ways, firstly they use the results of an OLS regression of the vote share a candidate receives on (logged) spending, incumbency and the size of the district (measured in thousands of registered voters) as a control variable and then they estimated the effect of spending on the candidate vote as a proportion of the electorate and they prove the finding of Jacobson: a strong effect of spending for challengers and a weaker effect for incumbents.

Furthermore, they used the share of spending to predict vote share rather than spending as such and they concluded that vote share is not only responsive to relative spending in the elections they examined, but also that at very low levels, it is also responsive to small increases in absolute expenditures, in this case measured in the hundreds of euros. In a similar way they hinted that the marginal effect of spending on success within a candidate's party is approximately the same for challengers and incumbents. In conclusion, they examine the probability of wining and by using logit regression, they prove that a few more money for incumbents may lead to a reelection but not to an election for challengers.

Marie Rekkas in her article "the impact of campaign spending on votes in multiparty elections" through a structural behavior model of voter tried to figure out the effect of campaign spending on votes considering the endogeneity of campaign spending as well as the heterogeneity in voter preferences. She used data from the General elections of Canada in 1997. She uses voter's utility function, which is

$$u_{ijr} = x_{jjr}b + \gamma_1 expjr + \gamma_2(exp_{jr} \times in_{cjr}) + z_r\alpha + \sigma_1 exp_{jr}\nu_{1i} + \sigma_2(exp_{jr} \times in_{cjr})\nu_{2i} + \xi_j + \xi_r + \Delta\xi_{jr} + \varepsilon_{ijr}$$

$\delta_{jr} = +\sigma_1 ex_{pjr}\nu_{1i} + \sigma_2(exp_{jr} \times in_{cjr})\nu_{2i} + \varepsilon_{ijr}$

where $\delta_{jr} = x_{ijr}b+\gamma_1 exp_{jr}+\gamma_2(exp_{jr}\times inc_{jr})+z_r\alpha+\xi_j+\xi_r+\Delta\xi_{jr}$ captures the average voter's utility. The average voter's utility from challenger expenditure is given by $\sigma_1 exp_{jr}$ and by $(\gamma_1+\gamma_2)$ exp_{jr} for incumbent expenditure. The terms, σ_1 and σ_2 represent the standard deviation in utility associated with each of these expenditures. At this point, an "outside good" (j = 0) is introduced to capture the preferences of those individuals who choose not to vote. For identification purposes, this outside alternative is normalized such that $u_{i0r} = \varepsilon_{i0r}$.

The empirical results demonstrate the importance of candidate spending during the campaign period and the heterogeneity of voter preferences with respect to these expenditures. Candidates that held incumbency status were found to benefit substantially compared to their challengers. Gender was generally not found to be a significant determinant of Canadian voters' choice of candidate. Positive economic performance with respect to the unemployment rate and average personal disposable income were found to have significant effects for the governing party. The own- and cross-expenditure elasticity estimates revealed interesting findings. Political campaign spending was found not only to redistribute voters across parties, but also to shrink the size of the abstaining group of the electorate, thus raising important policy issues with respect to campaign spending limits and their impact on voter participation.

In conclusion, candidates spend a lot of money for their campaigns, but these resources are taken as exogenous, so more research is required.

Peter Loe Johen in 2005 wrote the article "How do local candidates spend their money? And does t matter?". This article had two goals, the understanding of why local candidates choose to distribute their money between TV or radio advertising and more local forms of campaigning, such as signs, volunteers, print brochures, and local infrastructure and if this money has an effect on probability of winning. In order to achieve this, he uses Broadcast Bureau of Measurement (BBM)'s 2000 measurement of media market radio audiences. He uses a model with two endogenous variables and four exogenous variables and it is focused in campaigns on Canada in 2000. This is a decidedly small model, and certainly ignores the demographic characteristics which are acknowledged predictors of vote share. His endogenous variables, Party Vote in 1997 and an Incumbency dummy, should both predict higher spending. The better a

party performed in the previous election, the more easily a candidate should raise funds. His four exogenous variables consist in his two media market measures, as well as the margin between first and second in the last election and the percentage obtained by the first place party.

The results indicate important differences across parties, and across incumbents and non-incumbents. For Canadian Alliance and Liberal candidates, incumbency predicts less local spending, while for Conservative and New Democratic candidates the opposite holds. Incumbency has no effect on ad spending. Finally, vote share always predicts spending, and always in the expected directions. The results give two conclusions, first, they are principally driven by local strategic considerations. Second, they are influenced, to a limited but measurable degree, by the structure of the media markets in which they occur. Furthermore, he computes the probability of winning. First, there are some differences between spending effects for local candidates for candidates from different parties. Indeed, Liberal candidates are harmed by advertising spending, and helped by more opposition spending, while no other candidates are affected by their spending decisions. Second, incumbency does not lead to different spending effects. For incumbency to matter for spending effects in this set-up, it would have to predict more spending in the first stage for a form of spending which then had a measurable effect on the vote at another level.

In November of 2012, Xafoudi Garyfallia wrote an article with a title “An economic analysis of voting in the regions of Canada”. In this article, the goal is to identify the determinants that motivate the Canadian citizens to turnout. Using the fixed and the random effects panel data techniques, she examines which are the political and the socioeconomic factors that affected the electoral participation in the last eight Canadian federal elections which were held during the period 1988-2011. These factors are socioeconomic: Gender, race, religion, home-language, population stability, the income, the gini coefficient, the unemployment rate, the changes in prices, the GDP per capita and economic growth when it comes to minorities, and marital status are variables that may affect voter turnout but without expecting some specific results. The political factors are closeness (percentage gap between the first and the second candidate or party) and campaign expenditures. The institutional factors are the electoral system, the means by which votes are converted into seats, the

electoral system could be majority, plurality or proportional plurality. Other factors are registration requirements, compulsory voting and concurrent elections.

For her research she used two datasets: the first dataset is a panel of data and focuses on all the Canadian federal elections, which were run during the period 1988-2011, covering eight general elections, the cross-sectional units consist of the ten Canadian provinces. The second one is a panel of data too consisting of district-level data for the Canadian federal elections during the period 2004-2011. The cross-sectional elements include all the federal electoral districts of the ten provinces. The dependent variable is the voter turnout rate. The most common measures of voter turnout, which are used in the literature, are two. The first measure is the ratio of all ballots cast to the voting-age population while the other one is the proportion of the registered voters who vote. In this research, it is used the second measure, the percent of the registered voters who actually voted, as the registration in Canada is automatic at the age of 18.

A panel data analysis model is applied in order to estimate the impact of various political and socioeconomic factors on voter turnout. Panel data consist of a combination of both cross-sectional elements and time-series data. The basic model is

defined by the following equation

$$y_{it}= \alpha+\beta x'_{it}+\mu_{it}+\varepsilon_{it},\ (i=1,\ \ldots,\ N,\ t=1,\ \ldots,\ T)$$

where y_{it} is the dependent variable, the voter turnout rate in this case, α is the intercept term, x'_{it} is a vector consisting of all the explanatory variables, β is a vector of parameters to be estimated, is the individual effect which affects y_{it} crosssectionally, but it is time-invariant and is the error term. The subscript i is referred to the cross-sectional elements, the provinces of Canada or the federal electoral districts of Canada (2003 Representation Order), while the subscript t is referred to the time-series data, the year that an election took place. The random effects model as a method is preferred.

The empirical results show that: the ex-post measure of closeness, the percentage difference between the first two parties or candidates, affects the voter turnout rate in a negative way, he candidates' expenses per elector have a positive impact on the participation rate, incumbency's sign affects the voting turnout in a positive way, the elderly population votes more, the population which is more educative votes also

more, the income inequality affects the voting turnout negatively, the unemployment is negatively associated to electoral participation.

4. EMPIRICAL ANALYSIS

4.1 Aim

The empirical implementation of the study focuses on the influence exerted on the voting turnout rate by a list of variables by using econometric methods. Main aim is to clarify the relationship between the voting turnout level, which is set as dependent variable in the regression equations formed and is given as a voters' population ratio and economic, social and demographic characteristics which are set as independent variables. The econometric models used for examining the nature of the relationship between the dependent and independent variables are illustrated afterwards and is consisted by panel data.

4.2 Data and model specification

The data that will be used for the completion of the research are collected by the Web site of Elections Canada database and the Web site of Statistics Canada database, and are referred in provincial and district level. More specifically province level data refer to 10 provinces and Canada as a whole and 9 elections (1984, 1988, 1993, 1997, 2000, 2004, 2006, 2008, 2011) consisting sample of 99 observation, while district level data refer to 307 districts and 4 elections (2004, 2006, 2008, 2011) consisting sample of 1,228 observations. Additionally, the research data were strongly balanced.

Based on the above the model that will be examined for provincial level is the following:

$$turnout_{i,t} = b_0 + b_1 close_{i,t} + b_2 exp\_el_{i,t} + b_3 incumb_{i,t} + b_4 demstruct_{i,t} + b_5 dens_{i,t} + b_6 schedu + b_7 inc + b_8 unempl_{i,t} + b_9 gini_{i,t} + b_{10} infl_{i,t} + b_{11} univedu_{i,t} + b_{12} electexp_{i,t} + \varepsilon_{it}$$

Where:

$turnout_{i,t}$: is the turnout percentage in elections for province i at time t

$close_{i,t}$: is the difference between the polling rate of the first party and the second party for province i at time t

$exp\_el_{i,t}$: are the total expenses per elector in thousands of Canadian dollars for province i at time t

$incumb_{i,t}$: is a dummy variable which indicates whether the prime minister puts candidacy in order to be re-elected for province i at time t, with 1= the prime minister seeks to be re-elected and 0=else

$demstruct_{i,t}$: is the percentage of the voters aged up to 65 years old for province i at time t

$dens_{i,t}$: is the number of residents attributable to every square kilometer for province i at time t

$schedu_{i,t}$: is the percentage of residents who are over 25 years old and have completed high school education for province i at time t

$inc_{i,t}$: is median income of the voters for province i at time t

$unempl_{i,t}$: is the unemployment rate for province i at time t

$gini_{i,t}$: is a measure for the income inequality for province i at time t

$infl_{i,t}$: is the inflation rate for province i at time t

$univedu_{i,t}$: is the percentage of residents who have completed university education for province i at time t

$electexp_{i,t}$: are the total expenses spend for the elections in thousands of Canadian dollars for province i at time t

$\varepsilon_{i,t}$: is the disturbance term

The model that will be examined for district level takes the form:

$$turnout_{i,t} = b_0 + b_1 close_{i,t} + b_2 \exp\_el_{i,t} + b_3 incumb_{i,t} + b_4 inc + b_5 unempl_{i,t} + b_6 \mathrm{educ}_{i,t} + b_7 cand_{i,t} + b_8 electexp_{i,t} + \varepsilon_{it}$$

Where:

$turnout_{i,t}$: is the turnout percentage in elections for district i at time t

$close_{i,t}$: is the difference between the polling rate of the first party and the second party for district i at time t

$exp\_el_{i,t}$: are the total expenses per elector in thousands of Canadian dollars for district i at time t

$incumb_{i,t}$: is a dummy variable which indicates whether the current incumbent puts candidacy in order to be re-elected for district i at time t, with 1= the current incumbent seeks to be re-elected and 0=else

$inc_{i,t}$: is median income of the voters for district i at time t

$unempl_{i,t}$: is the unemployment rate for district i at time t

$educ_{i,t}$: is the number of residents in thousands who have completed high school education for district i at time t

$electexp_{i,t}$: are the total expenses spend for the elections in thousands of Canadian dollars for province i at time t

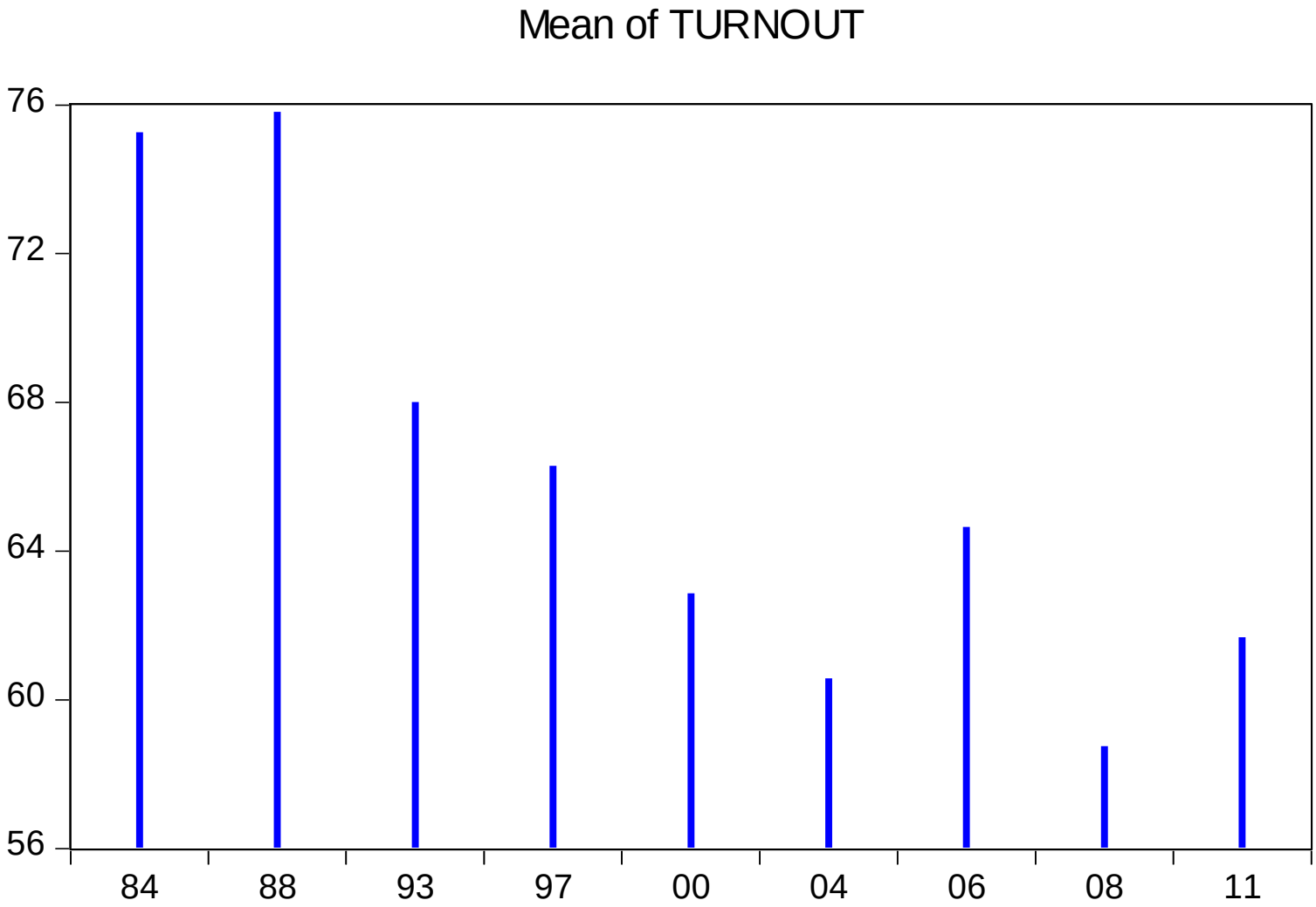
$\varepsilon_{i,t}$: is the disturbance term

4.3 Descriptive statistics, correlations and graphs

Before estimating the models under investigation we will proceed with basic econometric analysis of the variables used presenting the descriptive statistics and the correlation matrix obtained for them. The estimation of the models will be carried out by using fixed effects panel data regressions. Additionally, in a second stage analysis the explanatory variables that affect statistically significant the dependent variable will be isolated and the econometric models will be estimated in order to capture the relationships occurred by excluding the variables that do not affect the voters' turnout in order to detect any changes in estimations.

Initially presenting graphically the voters turnout in every elections from 1984 to 2011 it is observed a negative trend overtimes. More specifically the voters' turnout in the elections of 1984 and 1988 is equal to 75.26% and 75.81% respectively and declines significantly in the elections of 1993 at 68.01% following the same trend in the elections of 1997 and 2000 and reaching a percentage of 60.58 in the elections of 2004. At 2006 the voters turnout increases to 64.65% but this result is instant as it declines to 58.75% in the elections of 2008 while it reaches 61.58 in 2011.

Figure 1: Average turnout level in Canada elections



The following tables 1 and 2 present the descriptive statistics of the research variables for provincial and district level. More specifically mean, median, minimum, maximum, standard deviation, skewness and kurtosis are presented.

As it is shown the average turnout of voters is equal to 65.99%. Also, the average difference between the first party and the runner up is 20.67% which is quite quiet high, the average expenses per elector in thousands of Canadian dollars is equal to 1.94 and the average percentage of voters who are over 65 years old is 16.63%. Also, it is shown that in every square kilometer correspond 7.70 residents, the 18.15% of the voters have completed their high school education and the 14.94% university education. The average median income is equal to 49,028.28 Canadian dollars while the average unemployment and inflation rate is equal to 9.46% and 2.65% respectively. Finally the average value of the gini coefficient is equal to 0.29 which shows moderate inequalities as it takes values from 0 (perfect equality) to 1 (perfect inequality). Focusing on descriptive statistics related to the distribution of the data such as skewness and kurtosis it is noticed that all variables used in our model show positive (right) asymmetry as skewness is positive, and mean is greater than median (except demstruct and schedu in which mean is lower than median). To have symmetrical distribution skewness should be zero or at least be close to zero which happens the cases of turnout, schedu, gini, infl and univedu. Also we observe that kurtosis is close to 3 for most variables (except exp_el and inc), and the distribution of the data shows slight convexity. It is noted that kurtosis lower than 3 indicates leptokurtic distribution and greater than 3 platykurtic distribution.

As regards the descriptive statistics results in district level it is shown that the average turnout and unemployment rate are lower than in provincial level, while the average closeness, expenses per elector, median income and total elections expenses higher. The variables turnout and electexp show slight negative asymmetry and all variables except educ have platykurtic distribution.

Table 1: Descriptive statistics for province level

	Mean	Median	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis
turnout	65.99	64.70	84.90	47.70	7.54	0.18	2.64
close	20.67	17.83	67.18	0.12	15.37	0.95	3.65
exp_el	1.94	1.84	4.34	0.80	0.63	1.62	6.56
demstruct	16.63	16.80	20.00	10.50	2.06	-0.62	2.90
dens	7.70	4.60	24.70	1.40	6.91	1.12	3.04
schedu	18.15	18.94	26.05	10.99	3.09	-0.25	2.55
inc	49,028.28	47,500.00	71,100.00	40,800.00	6,169.63	1.13	4.30
unempl	9.46	9.00	20.10	3.60	3.67	0.79	3.33
gini	0.29	0.29	0.33	0.24	0.02	-0.24	2.82
infl	2.65	2.46	5.06	0.79	1.00	0.42	2.48
univedu	14.94	14.44	26.17	6.68	4.40	0.41	2.54
electexp	6,479,889.00	1,827,040.00	41,590,025.00	198,540.00	10,207,353.00	2.31	7.35

Table 2: Descriptive statistics for district level

	Mean	Median	Maximum	Minimum	Std.Dev.	Skewness	Kurtosis
turnout	61.18	61.90	77.00	35.80	6.08	-0.56	3.71
close	21.39	18.60	75.20	0.10	15.93	0.87	3.29
exp_el	3.24	3.08	16.59	0.02	1.51	1.79	12.59
inc	55,657.25	53,203.00	203,021.40	3,782.00	15,615.27	2.73	21.10
unempl	6.97	6.80	15.60	3.50	1.88	1.03	6.83
educ	1,158.22	954.60	2,293.40	17.80	777.25	0.24	1.59
cand	5.19	5.00	10.00	3.00	1.11	0.87	3.97
electexp	14,325,880.00	14,399,664.00	36,706,961.00	73,818.00	5,281,096.00	-0.12	3.43

Interpreting the correlation matrixes arising is observed negative and low correlation between the variables turnout and close both in provincial and district level ($r=-0.242$, $p=0.016$ and $r=-0.220$, $p<0.001$ respectively) showing that as the difference between the polling rate of the first party and the second party increases the turnout percentage decreases and vice versa. Also, it is observed moderate positive correlation between the turnout level and the amount of expenses spend per elector in provincial level as the corresponding Pearsons r is equal to 0.337 ($p=0.001$), which means that as parties spending increases the turnout percentage also increases, while similar is the relationship between the turnout level and the number of residents attributable to every square kilometer for provincial level ($r=0.348$, $p<0.001$). In contrast, it is shown that for provincial level as the median income increases the turnout percentage decreases ($r=-0.102$, $p=0.023$), while contrary for district level the corresponding correlation coefficient is positive. For provincial level it is shown that as unemployment and inflation rate increase the turnout level also increases ($r=0.209$, $p=0.023$ and $r=0.412$, $p<0.001$ respectively), while as the inequalities of the population and the percentage of the voters that completed university education for provincial level increase the turnout level decreases ($r=-0.569$, $p<0.001$ and $r=-0.488$, $p<0.001$ respectively). Finally, for district level the correlation between variables turnout and educ is negative but quite low ($r=-0.098$, $p=0.001$), indicating that as the number of voters that completed their high school education increases the turnout level decreases while the correlation between the total amount of expenses spend for the election and the turnout percentage is positive ($r=0.187$, $p<0.001$).

Table 3: Correlation matrix for provincial level

(Numbers in parentheses show the p-values)

	turnout	close	exp_el	demstruct	dens	schedu	inc	unempl	gini	infl	univedu	electexp
turnout	1											
close	-0.242	1										
	(0.016)											
exp_el	0.337	-0.295	1									
	(0.001)	(0.003)										
demstruct	-0.120	-0.422	0.427	1								
	(0.238)	(0.000)	(0.000)									
dens	0.348	-0.174	0.432	0.232	1							
	(0.000)	(0.085)	(0.000)	(0.021)								
schedu	-0.102	0.246	-0.157	-0.023	-0.311	1						
	(0.316)	(0.014)	(0.121)	(0.823)	(0.002)							
inc	-0.228	0.180	-0.362	-0.008	-0.109	0.578	1					
	(0.023)	(0.075)	(0.000)	(0.941)	(0.284)	(0.000)						
unempl	0.209	-0.208	0.132	-0.292	0.194	-0.552	-0.538	1				
	(0.037)	(0.039)	(0.191)	(0.003)	(0.054)	(0.000)	(0.000)					
gini	-0.569	0.207	-0.407	0.024	-0.440	0.337	0.591	-0.528	1			
	(0.000)	(0.040)	(0.000)	(0.811)	(0.000)	(0.001)	(0.000)	(0.000)				
infl	0.412	-0.162	0.167	-0.181	0.121	-0.251	-0.127	0.091	-0.118	1		
	(0.000)	(0.110)	(0.098)	(0.074)	(0.232)	(0.012)	(0.209)	(0.373)	(0.245)			
univedu	-0.488	0.216	-0.351	0.214	0.054	0.404	0.736	-0.617	0.646	-0.392	1	
	(0.000)	(0.032)	(0.000)	(0.034)	(0.596)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)		
electexp	-0.033	0.026	-0.191	-0.124	-0.195	0.242	0.317	-0.194	0.349	-0.125	0.340	1
	(0.746)	(0.802)	(0.058)	(0.222)	(0.054)	(0.016)	(0.001)	(0.054)	(0.000)	(0.218)	(0.001)	

Table 4: Correlation matrix for province level

	turnout	**close**	**exp_el**	**demstruct**	**dens**	**schedu**	**inc**	**unempl**	**gini**	**infl**	**univedu**	**electexp**
turnout	1											
close	-0.242	1										
	(0.016)											
exp_el	0.337	-0.295	1									
	(0.001)	(0.003)										
demstruct	-0.120	-0.422	0.427	1								
	(0.238)	(0.000)	(0.000)									
dens	0.348	-0.174	0.432	0.232	1							
	(0.000)	(0.085)	(0.000)	(0.021)								
schedu	-0.102	0.246	-0.157	-0.023	-0.311	1						
	(0.316)	(0.014)	(0.121)	(0.823)	(0.002)							
inc	-0.228	0.180	-0.362	-0.008	-0.109	0.578	1					
	(0.023)	(0.075)	(0.000)	(0.941)	(0.284)	(0.000)						
unempl	0.209	-0.208	0.132	-0.292	0.194	-0.552	-0.538	1				
	(0.037)	(0.039)	(0.191)	(0.003)	(0.054)	(0.000)	(0.000)					
gini	-0.569	0.207	-0.407	0.024	-0.440	0.337	0.591	-0.528	1			
	(0.000)	(0.040)	(0.000)	(0.811)	(0.000)	(0.001)	(0.000)	(0.000)				

infl	0.412	-0.162	0.167	-0.181	0.121	-0.251	-0.127	0.091	-0.118	1		
	(0.000)	(0.110)	(0.098)	(0.074)	(0.232)	(0.012)	(0.209)	(0.373)	(0.245)			
univedu	-0.488	0.216	-0.351	0.214	0.054	0.404	0.736	-0.617	0.646	-0.392	1	
	(0.000)	(0.032)	(0.000)	(0.034)	(0.596)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)		
electexp	-0.033	0.026	-0.191	-0.124	-0.195	0.242	0.317	-0.194	0.349	-0.125	0.340	1
	(0.746)	(0.802)	(0.058)	(0.222)	(0.054)	(0.016)	(0.001)	(0.054)	(0.000)	(0.218)	(0.001)	

Numbers in parentheses show the p-values

Table 5: Correlation matrix for district level

	turnout	**close**	**exp_el**	**inc**	**unempl**	**educ**	**cand**	**electexp**
turnout	1							
close	-0.220)	1						
	(0.000							
exp_el	-0.045	-0.289	1					
	(0.115)	(0.000)						
inc	0.109	0.009	-0.092	1				
	(0.000)	(0.761)	(0.001)					
unempl	0.040	-0.193	0.082	-0.132	1			
	(0.165)	(0.000)	(0.004)	(0.000)				
educ	0.098	-0.189	-0.027	0.221	-0.036	1		
	(0.001)	(0.000)	(0.338)	(0.000)	(0.210)			
cand	-0.008	-0.050	0.012	-0.088	-0.079	0.142	1	
	(0.790)	(0.079)	(0.664)	(0.002)	(0.006)	(0.000)		

electexp	0.187	-0.370	0.720	0.066	-0.015	0.307	0.118	1
	(0.000)	(0.000)	(0.000)	(0.022)	(0.590)	(0.000)	(0.000)	

Numbers in parentheses show the p-values

4.4 Regression estimations

Provincial level

Initially we estimate the regression model for province level as it has been presented and using the fixed effects method

$$
\begin{aligned}
turnout_{i,t} = b_0 + b_1 close_{i,t} + b_2 exp\_el_{i,t} + b_3 incumb_{i,t} + b_4 demstruct_{i,t} \\
+ b_5 dens_{i,t} + b_6 schedu + b_7 inc \\
+ b_8 unempl_{i,t} + b_9 gini_{i,t} + b_{10} infl_{i,t} + b_{11} univedu_{i,t} \\
+ b_{12} electexp_{i,t} + \varepsilon_{it}
\end{aligned}
$$

The results obtained by applying the above are presented in Table 6:

Table 6: Model estimation for province level

Dependent Variable: turnout					
Variable	Coefficient	Std. Error	t-Statistic	Prob.	
close	-0.091	0.030	-3.008	0.004	***
exp_el	1.510	1.109	1.361	0.178	n.s.
incumb	3.247	0.889	3.655	0.001	***
demstruct	-0.453	0.497	-0.910	0.366	n.s.
dens	0.231	0.838	0.276	0.784	n.s.
schedu	-0.128	0.202	-0.633	0.529	n.s.
inc	0.001	0.001	2.118	0.038	**
unempl	1.031	0.272	3.795	0.000	***
gini	-120.602	42.364	-2.847	0.006	***
infl	1.118	0.449	2.487	0.015	**
univedu	-0.664	0.305	-2.179	0.032	**
electexp	0.000	0.000	0.686	0.495	n.s.
c	86.059	18.735	4.593	0.000	***
R-squared	0.878				
Adjusted R-squared	0.843				
F-statistic	25.0194				
Prob(F-statistic)	0.000				

**. Coefficient is significant at the a=5% level
***. Coefficient is significant at the a=1% level
n.s.. Non significant coefficient

Interpreting the results of the fixed effects regression is observed that the variable close is statistically significant (p=0.004) with a negative sign (b_1=-0.091) indicating that the influence of the difference between the first party and the runner up to the elections turnout rate is negative. Also it is shown that the variable incumb is also statistically significant p=0.001). The positive sign of b_3 which is equal to 3.247, signals that in cases that the prime minister seeks to be re-elected the turnout percentage increases by 3.25%.

Additionally, the amount of the median income of the population also affects in a positive way the turnout level (p=0.038) and the coefficient of the unemployment rate is also positive and statistically significant (b_8=1.031, p<0.001). Examining this effect, it is shown that the increase of unemployment leads to an increase on the elections turnout level.

Another variable which is statistically significant is gini (b_9=-120.602, p=0.006). The sign of the coefficient b_9 is in this case negative and this result shows that inequalities between the voters raise the voting turnout decrease with high density as the corresponding coefficient is high.

Also, it is observed that inflation affects positively the turnout rate (b_{10}=1.118, p<0.015) showing that as the prices level increases the participation of the voters in the elections also increases and vice versa, while as the percent of the population who have competed university education increases the voters turnout rate moves into the opposite direction (b_{12}=-0.664, p=0.032).

Regarding the other explanatory variables of the econometric model, it is shown that exp_el, demstruct, dens, schedu and electexp are not obtained to be statistically significant (p>0.05) and is therefore do not affect the dependent variable of turnout level

The coefficient of determination on the above fixed effects regression is equal to 0.878. This means that the variability of the dependent variable (turnout) is determined by the variability of the independent variables in a percentage of 87.8% which is quite high

By excluding from the econometric model the variables that do not affect significantly the dependent variable in order to detect any changes in the given results we estimate the model:

$$turnout_{i,t} = b_0 + b_1 close_{i,t} + b_2 incumb_{i,t} + b_3 inc + b_4 unempl_{i,t} + b_5 gini_{i,t} + b_6 infl_{i,t} + b_7 univedu_{i,t} + \varepsilon_{it}$$

By results obtained by applying the above estimation which presented in Table 7 it is conducted that the signs of the independent coefficients do not change and their values differ slightly from those in the initial model.

Table 7: Model estimation excluding non significant variables for province level

Dependent Variable: turnout					
Variable	Coefficient	Std. Error	t-Statistic	Prob.	
close	-0.097	0.029	-3.358	0.001	***
incumb	2.873	0.804	3.573	0.001	***
inc	0.001	0.001	2.323	0.023	**
unempl	1.040	0.217	4.790	0.000	***
gini	-89.396	36.592	-2.443	0.017	**
infl	1.042	0.410	2.540	0.013	**
univedu	-0.857	0.209	-4.099	0.000	***
c	78.236	11.446	6.835	0.000	***
R-squared	0.872				
Adjusted R-squared	0.845				
F-statistic	32.58				
Prob(F-statistic)	0.000				

**. Coefficient is significant at the a=5% level
***. Coefficient is significant at the a=1% level

District Level

By estimating the regression model formed for district lever and using the fixed effects method the following results arise:

$$turnout_{i,t} = b_0 + b_1 close_{i,t} + b_2 \exp\_el_{i,t} + b_3 incumb_{i,t} + b_4 inc + b_5 unempl_{i,t} + b_6 \mathrm{educ}_{i,t} + b_7 cand_{i,t} + b_8 electexp_{i,t} + \varepsilon_{it}$$

Table 8: Model estimation for district level

Dependent Variable: turnout					
Variable	Coefficient	Std. Error	t-Statistic	Prob.	
close	-0.033	0.009	-3.682	0.000	***
exp_el	-1.160	0.179	-6.479	0.000	***
incumb	0.961	0.375	2.566	0.010	**
inc	0.001	0.001	0.064	0.949	n.s.
unempl	-0.316	0.148	-2.135	0.033	**
educ	-0.006	0.002	-3.349	0.001	***
cand	-0.073	0.117	-0.619	0.536	n.s.
electexp	0.001	0.001	9.241	0.000	***
c	68.262	2.164	31.548	0.000	***
R-squared	0.746				
Adjusted R-squared	0.659				
F-statistic	8.564				
Prob(F-statistic)	0.000				

**. Coefficient is significant at the a=5% level
***. Coefficient is significant at the a=1% level
n.s.. Non significant coefficient

As observed also in this case the variable close affects dependent variable of the turnout rate (b1=-0.033, p-value<0.001) with the sign of the coefficient b_1 being positive but its value significantly lower. Conversely to provincial level, in district level the coefficient b2 of the variable exp_el is presented to be statistically significant (p<0.001) and negative and therefore the amount spend per elector affects in a negative way the turnout level. Also, in district level when the current incumbent seeks to be re-elected the turnout level is observed to be higher (b3=0.961, p=0.010).

The coefficient of the unemployment rate appears to be negative (b5=-0.306, p=0.033) showing that as unemployment rises the voting percentage declines, while similar is the effect of the number of people that completed their high school education (b6=-0.006, p=0.001). In contrast it is shown that as the total amount spend for the election increases the turnout rate also increases and vice versa. The

coefficients of the rest variables that complement the econometric model (inc and cand) are insignificant and thus the median income and the number of candidates do not affect the turnout level.

Finally, by excluding also for district level the variables that do not affect significantly the dependent variable it is shown that are not observed significant changes in the results.

$$turnout_{i,t} = b_0 + b_1 close_{i,t} + b_2 \exp\_el_{i,t} + b_3 incumb_{i,t} + b_4 unempl_{i,t} + b_5 \mathrm{educ}_{i,t} + b_6 electexp_{i,t} + \varepsilon_{it}$$

Table 9: Model estimation excluding non significant variables for district level

Dependent Variable:					
turnout					
Variable	Coefficient	Std. Error	t-Statistic	Prob.	
close	-0.033	0.009	-3.687	0.000	***
exp_el	-1.171	0.177	-6.612	0.000	***
incumb	0.967	0.374	2.587	0.010	**
unempl	-0.312	0.147	-2.119	0.034	**
educ	-0.006	0.002	-3.362	0.001	***
electexp	0.001	0.001	9.351	0.000	***
c	67.888	1.982	34.259	0.000	***
R-squared	0.746				
Adjusted R-squared	0.660				
F-statistic	8.634				
Prob(F-statistic)	0.000				

**. Coefficient is significant at the a=5% level

***.Coefficient is significant at the a=1% level

5. CONCLUSIONS

Canada's political and electoral system has been designed to foster transparency, fairness and justice, not only for all the political entities, but also for the electors. According to this framework, researchers who are interested on studying fields concerning political and economic analysis can exploit all the information and data that is published, for scientific purposes and development.

Relative to studies similar to this, states can use them. For many reasons, including, finding out ways of mobilizing people to have active civic lives, to have an integral electoral system, and to build democratic and progressive societies.

The aim of this study is whether or not voters' turnout is affected by various socioeconomic and political factors. For the empirical analysis, were used fixed effects panel data techniques and on a second stage, the statistically significant variables were examined again to indicate possible differences. In the results differences exist between the provincial and the district level analysis.

More extensively, total campaign spending is important only in district level and has a positive effect on electors' participation. Expenses per elector do not give statistically significant results for provincial level, but they do for district level with a negative direction. Relating to the other political factors, closeness is statistically significant for both levels, but differs in direction, where it shows negative effect in provincial level, whereas positive in district level. Incumbency is statistically significant variable with positive effect in both cases.

As regards socioeconomic factors, unemployment is statistically significant in both cases, with the provincial level effect being positive and the district level, negative. For those with high-school education, the analysis shows that, there is a negative effect at district level, but at provincial level the variable is not statistically significant. At provincial level, university education is an important factor with a negative influence on voters' turnout. Income affects voters' turnout only in provincial level, and positively.

In provincial level, we examine also, the income inequality, which gave negative significant and negative results, inflation with significant and positive results and demographic structure with any important results.

Literature, relevant to this study, has similarities and differences, but that is a fact that, many researchers have observed. Usually, the cause is the use of different techniques, differences between the systems of countries, or credibility of data.

Total campaign spending for Canada, is an important factor for mobilizing residents to vote, and in most cases across literature, findings are similar. As campaign spending increases, there is more information directed to electors, which activates people to participate.

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