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Canada”*

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Abstract

In this study, our objective is to identify the determinants that mobilize the Canadian citizens to turnout. Using the fixed and the random effects panel data techniques, we examine 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. We find that all the factors, with the exception of the population density, affect the voter turnout rate either in a positive or in a negative way.

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1. Introduction

A question of great interest for the social scientists is why citizens vote. According to Downs (1957), in elections where the size of the electorate is very large, the probability of a pivotal vote is close to zero and so is the utility that someone acquires from the act of voting. On the other hand, there are some costs for the voter in order to participate in the elections, such as to learn where he votes, to be informed about the candidates and to go to the polls on Election Day. Therefore, according to the Rational Choice Theory, citizens should not vote since the costs outweigh the indirect benefits. Despite this, people still vote. This phenomenon is called the “paradox of voting”.

Nevertheless, it is argued that voters still vote because they have direct benefits too. The voter receives consumption benefits from the act of voting except the benefits he may gain from the outcome of the elections. He may feel that he has fulfilled his civic duty or he helped to preserve democracy (Riker & Ordeshook, 1968).

A lot of studies have been conducted in order to determine what are the factors as well as the characteristics that motivate the citizens to vote. In these studies, it is investigated if and how various socioeconomic, political or institutional determinants influence the voter turnout rate. The aim of this thesis is to examine the Canadian case during the period 1988-2011. Using panel data techniques we examine if miscellaneous political and socioeconomic factors affect the electoral participation in the Canadian federal elections and on what direction they may affect it.

The structure of the study is the following. Chapter 2 summarizes the main determinants which are examined in the literature and may affect the electoral participation as well as the expected impact that may have on voter turnout. In this chapter, we also present the results of some previous researches. These researches, which are presented, use both aggregate and individual-level data. Furthermore, we focus on the Canadian electoral system and the outcomes of previous investigations for Canada. In Chapter 3, we describe the data which was used for this analysis and their sources, and we display the summary statistics while in Chapter 4 the econometric methodology which was employed is presented. The empirical results of the thesis are reported in Chapter 5. Finally, Chapter 6 concludes.

2. Theoretical Background & Literature Review

There are a lot of factors which determine whether a citizen will cast a ballot or not. These are classified into three main categories, the socioeconomic, the political and the institutional factors.

2.1 Socioeconomic factors

Every person takes significant decisions about his life taking into account various socioeconomic factors. The most socioeconomic factors may affect one's decision to vote too. A lot of these variables may have an impact on voter turnout but not in a specific way while others are expected to affect it in a particular direction. Gender, race, religion, home-language, when it comes to minorities, and marital status are variables that may affect voter turnout but without expecting some specific results.

Conversely, education is expected to be positively related with electoral participation (Chapman & Palda, 1983, Endersby et al., 2002, Fornos et al. 2004). The more educated a person is, the less the costs of acquiring political information. Additionally, it is easier for them to process this information.

Population stability is another variable that is expected to have a positive influence on voter turnout (Endersby et al., 2002, Geys, 2006). Citizens who live for a very long period in a specific place feel greater "social pressure" and are better informed about the political situation, so they have consumption benefits and reduced information costs. There are a lot of measures of stability. Two indicative measures are the measure of movers, the percentage of citizens who used to live in a different area five years ago, which Endersby et al. (2002) use, and the percentage of residents who own the house they live in. On the contrary, concerning the population size and the population concentration, Geys (2006) supports that these determinants are inversely related with voter turnout. When the population is very large, the probability that one's vote will make the difference is very small according to the Downsian theory. Moreover, in places with greater population density, in big cities for example, smaller turnout rates are expected because there is no "social pressure". However, Calcagno and Westley (2008) argue that the expected sign for this factor is uncertain. In more densely populated areas the voter turnout rates are expected to be greater since the

election campaigns target to larger audience. Additionally, voters in these areas have greater access to modern media such as the internet and the social networks. On the other, they take into account that in areas with greater population density there are more voters too, so the probability of a pivotal vote is decreasing.

Age is also an important demographic characteristic that may affect the electoral participation. It is expected that older people, people who are over 65, are more likely to participate in the electoral process. Older voters have more time in order to acquire information about the candidates and lower opportunity costs of voting. Furthermore, a lot of candidates' policies target on this age group (Calcagno and Westley, 2008). In contrast, young citizens are expected to participate in smaller rates. Until recently, it was believed that youth abstention was a "life cycle" effect. In other words, young people increase the turnout rates as they age. However, according to recent studies, this effect does no longer hold. It seems to have been substituted by the "generational replacement" (Barnes, 2010). The willingness of the young people to participate in the electoral process seems to be declining over time. This abstention may be due to the aversion of youths to political and economic situation or just to indifference about politics (Archer & Wesley, 2006). Latest low turnout rates may be caused by this phenomenon.

Finally, previous voter turnout rates may also affect the electoral participation in a positive way. Citizens who voted in the past are more prone to vote in the future as well (Geys, 2006).

Concerning the economic determinants that possibly affect voter turnout, the income, the gini coefficient, the unemployment rate, the changes in prices, the GDP per capita and economic growth are the main factors which are studied. The expected sign on income is ambiguous. People with higher income are better informed and have greater benefits from participating. Then again, they have greater opportunity costs too. The gini coefficient represents the income inequality. It ranges from zero, representing absolute equality between households' income, to 1 indicating total inequality, i.e. that one household gets all the income. Regions with greater income inequality are associated with lower rates of voter turnout (Leighley & Nagler, 1992). GDP per capita is expected to have a positive relation with electoral participation whereas economic growth is expected to be inversely related with it.

Unemployment's impact on voter turnout is equivocal too. According to Chapman and Palda (1983) unemployed voters are usually less educated and so they have more costs in obtaining and processing information. According to this, a negative impact on voter turnout is expected. Oppositely, it is argued that the unemployed have lower opportunity costs and they may consider that the electoral process gives them the opportunity to change the existing situation. In this case, a positive relationship with voter turnout is expected.

Some other factors that may play a role in the decision to participate in the elections are union membership, sense of civic duty and personality characteristics. In young people, particularly, the family background, for example how often they used to discuss about politics with their parents, the neighborhood context, the school context and major events in their lives of adolescents should also have a significant impact on voter participation (Pacheco & Plutzer, 2008).

2.2 Political factors

On political factors, the two main variables which are assessed are closeness and campaign expenditures.

There are a lot of measures of closeness. The most common is the percentage gap between the first and the second candidate or party. Using this measure, it is expected that closeness is negatively associated with voter turnout considering that the closer the election outcome is, the higher the probability that one vote will affect the outcome (Matsusaka & Palda, 1993).

On the other hand, campaign expenses are expected to have a positive relation with electoral participation (Chapman & Palda, 1983, Endersby et al., 2002). When there are a lot of campaigns in order to inform the electorate about the electoral process or the positions of the candidates, it is easier for the citizens to be informed with less information costs, causing an increase on turnout.

Whether an incumbent seeks for re-election or not may have an impact on voter turnout too. Though, the expected sign of incumbency is ambiguous. Calcagno & Westley (2008) support that the incumbent may dissuade significant opponents, resulting in lower turnout rates, or they may attract more contributors and, consequently, more voters, increasing voter turnout.

Additional factors that may affect the electoral participation are democracy and the sense of political freedom that citizens have at the specific period, whether it is the first time that elections are held and the number of parties or candidates that participate in the elections (Fornos et al., 2004). Finally, partisanship is a factor that is expected to affect voter turnout in a positive way. Citizens who are loyal to a certain party are willing to support it without considering the costs.

2.3 Institutional factors

Institutional determinants are related to the different electoral rules of the countries. In the case of cross-sectional analysis between different countries, these factors should be taken into consideration.

One of the most important institutional factors is the electoral system, the means by which votes are converted into seats. The electoral system could be majority, plurality or proportional plurality. The more disproportionate the system is, the lower the incentives for citizens to vote (Jackman, 1987). Proportional plurality is expected to have the highest voter turnout rates.

Other significant institutional factors are registration requirements, compulsory voting and concurrent elections. When the registration on the electoral roll is not automatic, it is expected a decrease in voter turnout. Citizens have additional costs in order to participate in the elections because they have to be informed about the registration procedure and to go to the relevant department. On the contrary, compulsory voting and concurrent elections increase the electoral participation. When voting is mandatory, if a citizen abstains, it is possible to getting caught and fined or to lose social prestige (Geys, 2006). In the case of concurrent elections, the turnout costs are lower while the benefits are much greater. Consequently, greater turnout rates are expected.

In nationally competitive districts higher levels of turnout rates are expected too as the candidates have more incentives to mobilize voters. Additionally, multipartyism should have a negative effect while unicameralism a positive result. According to Jackman (1987), unicameralism is important in producing decisive governments because they do not have to negotiate with another legislative chamber. The frequency of the elections has a negative impact on the participation of the electorate

as well. Finally, another factor that may affect voter turnout is the year of the introduction of a suffrage, such as when women or young people at the age of 18-20 started voting, which had as a result the expansion of the electorate.

2.4 Empirical Literature

A lot of studies have been conducted in order to examine the voter turnout rates and to analyze the factors that impel a voter to cast a ballot.

These studies examine either cross-sectional data between different countries or data of a specific country. Moreover, some researchers use aggregate data while others individual-level data which were collected from election surveys. Individual-level data were used in order to avoid aggregation bias. Individual voters may not have specific characteristics but examining them as a group may give us different results.

Geys (2006) reviewed the empirical evidence of voter turnout through a meta-analysis of 83 aggregate-level studies. The main results of his research are the following. Concerning the socioeconomic variables, population size has statistical significant and negative, as was expected, effect on voter turnout, whereas population stability and previous turnout rates have statistical significant and positive relation with turnout rates. In political variables, the closeness of the election outcome is inversely related to it while campaign expenditures have statistical significant and positive effect on voter turnout. Finally, in institutional variables, where it is examined the different electoral systems in different countries, the proportional representation (PR) system results in higher turnout rates. Moreover, compulsory voting and concurrent elections have positive effect on voter turnout too, while registration requirements are inversely related to it as well as additional cost is required.

Jackman (1987) conducted an empirical analysis for 19 democracies during the decades of 1970s and 1960s examining the effect of various institutional factors. However, he excluded Switzerland and the United States from the estimations because they appeared to be outliers. The analysis showed that nationally competitive districts, unicameralism and compulsory voting are positively related with voter turnout while electoral disproportionality and multipartyism have a negative effect on it.

Fornos et al. (2004) used cross-sectional time-series data in order to examine voter turnout to presidential and legislative elections held in Latin American countries during the period 1980-2000. Presidential and legislative elections give the same results. Surprisingly, according to the results, nationally competitive districts are negatively related with voter turnout. Unicameralism, compulsory voting and concurrent elections have a positive effect. Democracy & political freedom and founding elections have a positive effect too. On the other hand, electoral disproportionality, multipartyism, urbanization, literacy, economic growth, GDP per capita and electoral competition have not statistical significant effects. In a nutshell, voter turnout in Latin American countries is affected by institutional and political variables but it is not affected by socioeconomic variables.

Fauvelle-Aymar & Stegmaier (2008) examined the factors that affect voter turnout in European Parliament elections in post-communist countries. They used the OLS method and categorized the variables in socioeconomic variables, economic variables, political variable and national factors. According to their results, age has a positive effect on voter turnout. Specifically, ages above 60 have higher rates of turnout, which is unexpected. Education has positive effect too, while population density is not statistically significant. Unemployment has statistically significant and negative relation with voter turnout whereas economic growth and GDP per capita have not statistically significant results. Finally, the support in European Union is positively related to voter turnout while the number of the elections during the last 18 months and the time till the next elections are negatively related to it.

Dettrey & Schwindt-Bayer (2009) examined the effect that various factors had on voter turnout in presidential elections in 52 countries between 1974 and 2004. They used two measures of voter turnout. The first measure is the percentage of registered voters that turnout and the second the proportion of voting-age population that votes. They used the OLS method with robust standard errors, clustered around countries. Concerning the first measure of voter turnout, second-round election, the number of candidates or parties, the years that the specific country is democratic (logged) and economic growth are negatively related with voter turnout. Incumbency, compulsory voting, the level of political freedom and the level of development have a positive effect while concurrent elections, plurality electoral rules, moderate and strong

presidential powers and competitiveness have no effect. Voting-age population measure of turnout gives similar results. The only difference is that incumbent running, the level of development and the economic growth have no effect anymore.

Steiner (2010), assuming that the economic integration constrains the national governments, examined whether this international integration affects voter turnout in a negative way. Aggregate data for parliamentary elections in 23 OECD democracies from 1965 to 2006 are analyzed. Two measures of voter turnout and three measures of economic integration, such as the sum of exports and imports as a share of GDP, are used. Additionally, there are control variables which are related with the electoral system as well as institutional and socioeconomic factors. In all the cases, internationally economic integration is negatively related with voter turnout, as it was expected.

Endersby & Kriekhaus (2008) wanted to investigate the effect that different electoral systems (PR, plurality, majority and mixed) might have on voter turnout. The dataset included all democratic elections for national parliaments from 1972 to 2000 which had available data. It included OECD nations as well as new democracies. They estimated two models using the OLS method. In the first model the dependent variable was turnout as a percent of the registered voters while in the second one as denominator of turnout it was used the voting-age population. Except electoral systems they examined some socioeconomic variables too, the average life expectancy, the GDP per capita, the illiteracy rate, the size of the population and the population density. Moreover, they included as explanatory variables compulsory voting, minimum voting-age and regional dummy variables. In both models, logged GDP per capita, population density and compulsory voting appeared to have positive and significant effect on turnout. On the other hand, logged population had a negative and statistically significant effect on voter turnout. Average life expectancy had a positive and significant effect on voting-age population turnout while illiteracy had a negative effect on registered voters' turnout. Concerning the electoral systems, the PR system appeared to have positive and statistically significant effect in both models, noticing greater impact when it is taking into account the voting-age population measure of turnout. The mixed system gave the opposite results, indicating that the turnout rates are significantly less than those of the PR system. Finally, the plurality

system gave non-significant results while the majority system seemed to have a negative effect only in the second model.

Calcagno & Westley (2008) studied 142 gubernatorial elections in the United States during the period 1989-1998 in order to analyze whether turnout could be explained by socioeconomic and political factors along with the different institutional structures under which these elections took place. They used panel data for their analysis and as a dependent variable they chose the turnout rate calculated by the voting-age population. For their estimations they used both fixed and random effects with virtually the same results. According to their findings, when the gubernatorial elections take place at the same year with the presidential elections, turnout is greater. Additionally, the percent of population above the 65 years and the percent of population that is public employees affect turnout in a positive way. Concerning the institutional variables, blanket, open and semi open primaries increase the voter turnout rate too. In contrast, the closing day of registration and the closeness measure are inversely related with it.

Gallego (2009) examined the contribution of generational and educational effects on voter turnout over the last four decades in Sweden, Norway and Germany using individual-level data. It was used a logit regression model with clustered standard errors. According to the results, turnout rates in Norway are declining over time whereas those of Sweden grew during the first period and declined afterwards. In all cases, age has a positive effect, which means that older people vote at higher rates. Education has a positive effect too. Finally, it was examined the interaction between education and time. The interaction coefficient gives positive results in the cases of Germany and Sweden which indicates that the effect of education on voting has become larger over time.

Rosenstone (1982) conducted an individual-level data analysis in order to examine the effect that the Recession of 1974 in the United States had on electoral process. The data that was used was from the November 1974 Current Population Survey. 8980 respondents were analyzed with the probit analysis and according to their responses people who are worse off financially, unemployed and with low income are less likely to vote. Additionally, analyzing time-series data for the period 1948-1980, it was found that worse economic condition, unemployment (less than 5 weeks), midterm

elections and the 18-20 year-old suffrage (1972) had a negative effect on voter turnout while the turnout of the previous period had a positive effect. For the period 1896-1980, the change in prices, the midterm elections, the women's suffrage (1920), the 18-20 year-old suffrage (1972) and the three wars (1918, 1942 and 1944) had a negative relation with voter turnout while the turnout rates of the two previous elections had a positive impact.

Pacheco & Plutzer (2008) examined the effects of economic and social disadvantage on youths' electoral participation in the United States. They analyzed the family background, the community context, the school context and major events in their lives. For their survey they used data from the National Education Longitudinal Survey for the period 1988-2000. According to their research, concerning the White citizens, low family income, single-parent household, attendance of a disadvantaged school, early parenthood, dropping out of school and being arrested had a negative relation with voter turnout while parental education had a positive effect. In the case of Black citizens, dropping out of school and being arrested had a negative effect and parental education had a positive effect. Finally, for Hispanic citizens the only variable that is statistically significant is parental education which had a positive effect on voter turnout. In short, it is observed that the most important variable which had a statistically significant and positive effect in all the cases is parental education. Surprisingly, neighborhood disadvantage had no effect at all.

Pacheco (2008) used data from eighth-graders attending schools across the United States who were interviewed in 1990, 1992, 1994 and 2000. One of the child's parents was interviewed too in 1988 and again in 1992. Pacheco (2008) wanted to examine if youths who live in politically competitive regions are more likely to vote in the future. OLS method was used for the analysis with the data clustered within schools and locales, which was clustered within states. The variables which have a positive effect on voter turnout are political competition, discussion about politics at home and church attendance. The number of residential mobility during adolescence has a negative effect. Finally, ethnic diversity, the educational attainment, the family income, the number of books within the home, the daily reading of the newspaper, the parents' educational level, the gender, the race and the later education attendance have no effect on voter turnout.

Anderson (2009) in his study considered how community psychology can interpret the political behavior. He examined variables which are associated with demographics, political characteristics and personality traits. He conducted a phone survey in Tallahassee in October and November of 2004. The survey had 822 respondents. Gender and home ownership have a negative effect whereas measures of internal and external efficacy, strength of partisanship and political knowledge have a positive effect. Concerning the personality traits, only emotional stability has a statistical significant effect and, specifically, it is negatively related with voter turnout.

2.5 Canadian Background

The political system of Canada is based on that of the United Kingdom. It is a constitutional monarchy composed of the Queen of Canada, who is officially represented by the Governor General, and Parliament. The federal Parliament consists of the Senate, the upper chamber, which normally has 105 members appointed by the Governor General on the recommendation of the Prime Minister and the House of Common, which is the lower chamber. The House of Common is formed by citizens' vote in general elections or by-elections resulting in 308 members elected so as to represent each region (Elections Canada).

Canada uses a plurality electoral system which is known as "first-past-the-post" system (FPTP). Elections are held based on geographical districts (Nasrallah, 2009). According to the Constitution of Canada, the number of the federal electoral districts as well as their boundaries is reviewed after each decennial census taking into account the changes and the movements of the Canadian population. The last redistribution completed in 2003 after the 2001 census and it counts 308 federal electoral districts in the ten provinces and the three territories of Canada. In every constituency, the candidate with the majority of votes wins a seat in the House of Commons and represents that district as a member of the Parliament. The political party that elects the most seats forms the government. By this system, elections are not quite competitive. Each citizen's vote counts only in the specific area. The Parliament has a maximum term of five years.

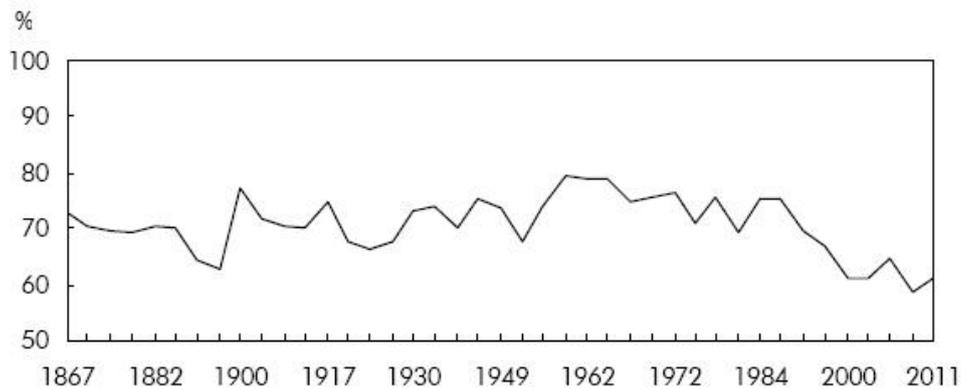
Apart from the federal level, Canada has provincial and territorial levels too. Provincial and territorial elections form regional governments. Territories are created

by the federal government, whereas the provinces (British Columbia, Alberta, Saskatchewan, Manitoba, Ontario, Quebec, New Brunswick, Nova Scotia, Newfoundland, Labrador and Prince Edward Island) are constitutionally autonomous entities.

The first Canadian elections were conducted in 1867. In those elections only the male British who had a real property of a certain value had the right to vote. Over the years, the electorate was expanded. In 1919 all women were given the right to vote in all federal elections. In 1960, Aboriginals were given the right to vote in federal elections and by 1969 they could also vote in provincial and territorial elections. Finally, in 1970 the voting-eligible age became 18 from 21 years old. Nowadays, every Canadian citizen who is 18 years old is automatically registered on electoral lists.

Elections Canada provides a number of alternative ways to vote for citizens who are unable to go to the polls on Election Day. Voters have the opportunity to vote at an advance poll or via the mail. Moreover, there are mobile polls and election officers that can go to the voter's home in exceptional circumstances.

As we can see from the graph, voter turnout for Canadian federal elections fluctuated around 70%. Though, during the 1990s, it started declining. In 2000s, the lowest turnout rates were recorded. The lowest voter turnout rate (58.8%) was observed in 2008. In 2011, it improved slightly to 61.1%. Generally, in all the federal elections which were held after 2000 the turnout rates were below 65% (Uppal & LaRochelle-Côté, 2012). Blais et al. (2004) argue that this decline is due to cultural changes. They claim that young people pay less attention about politics and the "life cycle" effect does no longer hold.



Source: Elections Canada.

Graph 1: Voter Turnout Rates of Canadian Federal Elections

Barnes (2010) analyzed the data of the Canadian Election Study (1965-2000) in order to examine youth participation. During the 1965-1980, youth under the age of 29 had lower participation rates by 10% compared with those who were over 35 years old. In 1984-2000, voter turnout rates at the age cohort of 18-24 dropped approximately 20%. Finally, in 2004-2008, the gap of the turnout rates between the first two age cohorts was about 6 to 11%.

2.6 Empirical Literature - The Canadian Case

Several studies have been conducted in order to explain the voter turnout rates in Canada. The results of some of these studies are presented below.

Chapman and Palda (1983) used aggregate-level electoral district-level data from the Canadian provincial elections which were held in five provinces through the period 1972-1978. These elections were conducted under campaign expenditure disclosure laws. According to their results, the size of the electorate has a positive impact on voter participation. Campaign expenses have a statistically significant and positive effect in 3 out of 10 cases and negative effect in one case which was unexpected. Income is inversely related with voter turnout in five cases whereas education has positive results in 8 out of 10 cases. Finally, the unemployment rate and the rate of females who were on the labor force give statistically significant and negative results in seven and six cases respectively.

Matsusaka and Palda (1993) wanted to examine the effect of closeness on Canadian voter turnout. They used three measures of closeness as well as additional control variables. For their research they used both aggregate (macro regressions) and individual-level (micro regressions) data in order to control for aggregation bias. In macro regressions they used 1979 and 1980 Canadian federal elections voter turnout rates. All the measures of closeness give negative results as it was expected. Concerning the control variables, the educational attainment, the percentage of the Catholics, the population growth rate and the campaign expenditures per capita are positively related with voter turnout while the percentage of people who were in the labor force and those who were born in Canada have an inverse relation. French-speaking population, average income and total campaign expenses give results with no statistical significance. In individual-level analysis, the responses of 2744 Canadians in the 1974, 1979 and 1980 Canadian election surveys were analyzed. None of the measures of closeness give statistically significant results indicating that there is aggregation bias.

Canada is a country with a lot of minorities. Lapp (1999) wanted to examine the turnout rates in these minorities and to research the hypothesis that leader mobilization increases turnout. He used individual-level data from five ethnic minorities in Montreal for the 1993 Canadian federal elections, the 1994 Quebec provincial elections and the 1994 Montreal municipal elections. The ethnic communities which were investigated were Jewish, Italian, Greek, Portuguese and Chinese. According to his findings, ethnic minorities in Montreal tend to vote in reduced rates. However, most of the results fail at the level of statistical significance. The only exception is the Greek minority which participates in all the elections.

Endersby et al. (2002) used data from the 1993 and 1997 Canadian federal elections. They examined for different measures of closeness coming to the conclusion that competitiveness is the best index. In all the cases, competitiveness gives strong and statistically significant results, as it was assumed. Per capita campaign expenses, proportion of French-language speakers, population density, education and income are positively associated with voter turnout while unemployment and the proportion of citizens that have changed residency the last five years are negatively associated with it. The results differ significantly when different measures of closeness are used.

Blais et al. (2004) wanted to examine the socioeconomic factors that led to the Canadian voter turnout decline. For their logit analysis they used the Canadian Election Studies from 1968 to 2000. According to their findings, citizens who are older, more educated, union members, religious and live in the West are more likely to vote. Moreover, the voter turnout rates are higher among those who were born in Canada or have a European origin.

Johnston et al. (2007) used survey data for Canadian federal elections during 1988-2004. They wanted to examine how the alienation of the voter from his preferred party, the indifference of the voter among the candidates, the competitiveness and the newly-eligible voters affect the participation of the electorate. Alienation and indifference are inversely related with voter turnout. Moreover, newly-eligible voters dummy gives a negative result which means that young people are more prone to abstain. Finally, the interaction between the competitiveness index and the newly-eligible voters dummy gives positive results. This indicates that young are affected by competitiveness at a higher degree compared with older voters.

Siaroff and Wesley (2011) used aggregate data in order to examine provincial voter turnout rates since 1965. They found that the year that the elections were held, the seats in the legislature, the number of the parties which had at least two seats, the dummy variable for the multiparty system, the measure of closeness, the size of the population (in thousands and logged) and the mean family income have all negative relation with voter turnout. On the other hand, the two-party system dummy, the two-party seat concentration, the change on the governor party after the elections, the proportion of the population that lives in rural areas as well as the proportion of the population that was born in the specific province have a positive impact on electoral participation. They concluded that in the case of the Canadian provinces, the demographic characteristics have greater impact on voter turnout in comparison with the party politics and the elections.

As it was mentioned, Aboriginal Canadians gained the right to vote in federal and provincial elections in 1960 and 1969 respectively. However, it is observed that even today, Aboriginals vote at lower rates in comparison with non-Aboriginal Canadians. Fournier and Loewen (2001) used post-election survey data so as to analyze this fact. The surveys were conducted by Elections Canada after the 2004 to 2011 federal

Elections. They estimate with logistic regression analysis two models. The first model analyzes the 2004-2008 studies and the second one analyzes the 2004-2011 studies without accounting for civic duty. Both models give similar results. It is observed that education, age, income, political interest and sense of civic duty are positively related with voter turnout while living on reserve has a negative effect on this. Examining the same variables in non-Aboriginals gives analogous result too. The main differences are that rural residency plays a positive role too and living on reserve does not affect voter turnout. To sum up, Aboriginal voters may vote at lower rates but they have the same socioeconomic characteristics with non-Aboriginals.

Uppal and LaRochelle-Côté (2012) wanted to examine the factors that are associated with voting in the 2011 Canadian federal elections. For their analysis they used a probit model and they concluded in the following results. Considering as a reference category the age cohort of 45-54, people who are older than 55 years have a higher probability to vote, whereas those who are below 44 are less likely. Education is also positively related with voter turnout. On the contrary, immigrants, people who do not own their house but they rent it, unemployed and people with children are inversely associated with electoral participation. Finally, citizens in the provinces of New Brunswick, Quebec and Prince Edward Island are more likely to vote in contrast with those who reside in Newfoundland and Labrador, Manitoba and Alberta.

Table 1 summarizes the literature review.

Table 1: Summary Table of Literature Review

Paper	Data/Methodology	Explanatory Variables	Results
Anderson (2009)	Phone survey in Tallahassee (US) – 2004 822 responses Logit regression	SC, NC, IE, EE, PoT, PeT, PK, PART, INC, GEN, AGE, AGE2, EDU, HOME, PT	SC, IE, PK, PART: positive relation GEN, HOME: negative relation
Blais et al. (2004)	Canadian Election Studies (1968-2000) Logit regression	AGE, AGE2, BB, GEN60, GEN70, POST90, SEASON, LEDU, MEDU, BEDU*POST90, GEN, UNION, RELIG, ATL, QUE, WEST, FOR, Non-EU, MAR, INC	AGE, BEDU*POST90, UNION, REL, MAR, INC: positive relation AGE2, BB, GEN60, GEN70, POST90, SEASON, LEDU, WEST, FOR, Non-EU: negative relation
Calgano-Westley (2008)	142 US gubernational elections (1989-1998) Panel data	REGDATE, EDU, INCUM, CLOSE, MOTOR, CONTROL, INC, PEY, OLD, DENSITY, POPGOV, EXP, EXP2, SEY, U, YEAR, BLANKET, OPEN, SOPEN, SCLOSED	PEY, OLD, POPGOV, BLANKET, OPEN, SOPEN: positive relation REGVOTE, CLOSE: negative relation
Chapman-Palda (1983)	Aggregate electoral district-level data from 10 Canadian provincial elections (1972-1978) OLS	SIZE, EXP, CLOSE, INC, EDU, FEMPAR, U	SIZE, EDU: positive relation EXP: in 3 positive relation & in 1 negative relation CLOSE, INC: negative relation
Dettrey&Schwindt-Bayer (2009)	Presidential elections in 52 countries (1974-2004) – 2 measures of turnout (registered voters, voting-age) OLS	CONCUR, PLUR, 2ndROUN, INCUM, MODPOW, STRPOW, CLOSE, NoCAND, COMP, YDEM, DeEMFREE, DEVEL, GROWTH	INCUM, COMP, DemFree, DEVEL: positive relation 2ndROUN, NoCAND, YDEM, GROWTH: negative relation
			COMP, DemFree: positive relation 2ndROUN, STRPOW, NoCAND, YDEM: negative relation
Endersby et al. (2002)	1993 & 1997 Canadian federal elections	COMPET, EXP, FRENCH, U, INC, EDU, MOVERS, DENSITY	COMPET, EXP, FRENCH, INC, EDU, DENSITY: positive relation U, MOVERS: negative relation
Endersby-Kriekhaus (2008)	1972-2000 democratic elections for national parliaments of OECD nations and new democracies – 2 measures of turnout (registered voters, voting-age) OLS	EXPECT, GDP, ILLIT, SIZE, DENSITY, COMP, MINAGE, PR, PLUR, MAJOR, MIXED	EXPECT, DENSITY, GDP, COMP, PR: positive relation ILLIT, SIZE, MAJOR, MIXED: negative relation
Fauvelle-	2004 European Parliamentary voter turnout	U, GDP, GROWTH, EUREFER, NEXTEL,	EUREFER, EDU, OLD: positive relation

Aymar&Stegmaier (2008)	in the post-communist countries OLS	NoELECT, EDU, YOUNG, OLD, DENSITY	U, NEXTEL, NoELECT: negative relation
Fornos et al. (2004)	Presidential & Legislative elections in Latin America (1980-2000) OLS	NATCOMP, DISPR, MULTIPART, UNICAM, COMP, CONCUR, DENSITY, EDU, GDP, GROWTH, FREEDOM, FOUNDEL, CLOSE	UNICAM, COMP, CONCUR, GDP, FREEDOM, FOUNDEL: positive relation NATCOMP: negative relation
Fournier-Loewen (2011)	Post-election surveys conducted by Elections Canada in 2004, 2006, 2008 and 2011 (Aboriginals & non-Aboriginals) Logistic regression	REG, LIVRESERV, GEN, AGE, EDU, INC, RURAL, DUTY, IMPISSUE	Aboriginals: REG, AGE, EDU, INC, DUTY: positive relation LIVRESERV: negative relation
			Non-Aboriginals REG, AGE, EDU, INC, RURAL, DUTY, IMPISSUE: positive relation LIVRESERV: negative relation
Gallego (2009)	Individual-level data in electoral participation in Sweden, Norway and Germany (last four decades) Logistic regression	TIME, TIME2, AGE, AGE2, BB, GEN60, GEN70, EDU, TIME*EDU	AGE, EDU, TIME*EDU: positive relation TIME2, AGE2, BB, GEN60, GEN70: negative relation TIME: negative relation in Norway, positive in Sweden
Geys (2006)	Meta-analysis of 83 empirical studies with aggregate-level research	SIZE, DENSITY, STABILITY, HOMOG, PREVTURN, CLOSE, EXP, NoCAND, DISPR, COMP, CONCUR, REGREQ	STABILITY, PREVTURN, EXP, COMP, CONCUR: positive relation CLOSE, DISPR: negative relation
Jackman (1987)	Empirical analysis of 19 industrial democracies in 1960s & 1970s OLS	NATCOMP, DISPR, MULTIPART, UNICAM, COMP	NATCOMP, UNICAM, COMP: positive relation DISPR, MULTIPART: negative relation
Johnston et al. (2007)	Individual-level analysis Canadian Election Studies (1988-2004) Logistic regression	ALIENAT, INDIFF, COMPET, COMPET*NEWLY-ELIG, NEWLY-ELIG	COMPET*NEWLY-ELIG: positive relation ALIENAT, INDIFF, NEWLY-ELIG: negative relation
Lapp (1999)	Individual-level analysis for five Montreal minorities 1993 Canadian federal, 1994 Quebec provincial & 1994 Montreal municipal elections	JEWISH, ITALIAN, CHINESE, PORTUGUESE, GREEK, INC, YOUNG, OLD, NonCITIZ, EARLYIMM, HOMELANG, MOVERS, HOMEOWNER	GREEK, OLD, EARLYIMM, HOMEOWNER: positive relation JEWISH, CHINESE, YOUNG, NonCITIZ, HOMELANG, MOVERS: negative relation INC: positive relation in one case and negative in another
Matsusaka-Palda (1993)	Aggregate-level analysis for the 1979 & 1980 Canadian federal elections	CLOSE, EDU, LABOR, CATHOL, BORNCAN, FRENCH, POPGROWTH, INC, EXP	EDU, CATHOL, POPGROWTH, EXP: positive relation

	Individual-level analysis for the 1979 & 1980 Canadian federal elections OLS		CLOSE, LABOR, BORNCAN: negative relation In individual-level, CLOSE: statistical insignificant
Rosenstone (1982)	Individual-level US data in the 1974 Recession Aggregate-level analysis in US elections (1896-1980) Probit analysis	ECONADV, U, INC, MIDTERM, WOMSUFFR, YOUTHSUFFR, WAR, PREVTURN	Individual-level analysis INC: positive relation ECONADV, U: negative relation Aggregate-level analysis U, WAR: negative relation
Siaroff-Wesley (2011)	Aggregate-level analysis Canadian provincial elections since 1965	DISPR, SIZE, RURAL, INC	RURAL: positive relation SIZE, INC: negative relation
Steiner (2010)	Aggregate-level data for parliamentary elections in 23 OECD democracies (1965-2006) (two measures of turnout) OLS	ECONINT, COMP, NoCAND, CLOSE, SIZE, AGE, GDP	COMP: positive relation ECONINT, CLOSE, SIZE, GDP: negative relation
Uppal-LaRochelle-Côté (2012)	2011 Canadian federal elections Probit analysis	GEN, AGE, EDU, MS, FOR, U, HOME, RURAL	AGE, EDU, HOME: positive relation GEN (male), MR (married), FOR, U, RURAL: negative relation

2ndROUN: second-round election, AGE2: age squared, ALIENAT: alienation, ATL: Atlantic, BB: baby-boomer (born between 1945-1959), BEDU*POST90: Better educated*post-1990, BLANKET: blanket primary, BORNCAN: percentage of citizens who were born in Canada, CATHOL: catholics, CLOSE: closeness (the gap between the first two parties), COMP: compulsory voting, COMPET: competitiveness, CONCUR: concurrent elections, CONTROL: dummy for control by one party, DEMFREE: democratic freedom, DENSITY: population density in the area, DEVEL: level of development, DISPR: electoral disproportionality, DUTY: sense of civic duty, ECONADV: those who were worse off financially, EDU: education, EE: external efficacy, EUREFER: voted Yes in the European Union Referendum, EXP: campaign expenditures per capita, EXPECT: average life expectancy, FEMPAR: females in the labor force, FOR: Foreign born, FREEDOM: Freedom House rating, FRENCH: French-speaking population, FOUNDEL: founding elections for the first time, GDP: GDP per capita, GEN: gender, GEN60: Generation 60s (born in the 60s), GEN70: Generation 70s (born in the 70s), GROWTH: economic growth (change of GDP), IE: internal efficacy, HOME: home ownership, HOMELANG: percent who speak English at home, HOMEOWNER: homeownership, HOMOG: population homogeneity, ILLIT: illiteracy rate, IMPISSUE: parties talk about important issues, INC: income, INCUM: incumbent running, INDIFF: indifference, LABOR: percentage of citizens who are in the labor force, LEDU: lesser educated, LIVRESERV: living on reserve, MAJOR: majority electoral system, MAR: marital status, MEDU: middle educated, MINAGE: minimum voting age, MIXED: mixed electoral system, MODPOW: moderate presidential power, MOTOR: dummy for motor voter, MOVERS: those who have changed residency the last five years, MULTIPART: multipartism, NATCOMP: nationally competitive districts, NC: number of contexts, NEXTEL: time till the next elections, NEWLY-ELIG: anyone who votes for the first or second time, NoCAND: number of candidates, NoELECT: number of elections the last 18 months, NonCITIZ: percent who are not Canadian citizens, Non-EU: Non-European origin, OLD: voters above the age of 60/65, OPEN: open primary, PART: partisanship, PeT: personal trust, PK: political knowledge, PEY: dummy for presidential elections, PLUR: plurality electoral

system, POPGOV: percent of public employees POPGROWTH: population growth rate, POST90: post-1990 election, PoT: political trust, PR: proportional representation electoral system, PREVTURN: previous turnout rates, PT: personality traits, QUE: Quebec, REG: registered, REGDATE: closing day of registration, REGREQ: registration requirements, RELIG: religiosity, RURAL: rural residence, SC: sense of community, SCLOSED: semi closed primary, SEASON: summer/winter, SEY: dummy for senate elections, SIZE: population size, SOPEN: semi open primary, STABILITY: population stability, STRPOW: strong presidential power, TIME: time of the elections, U: unemployment, UNICAM: unicameralism, UNION: union membership, WOMSUFFR: Women Suffrage, YDEM: years democratic (logged), YEAR: time trend variable, YOUNG: voters under the age of 29, YOUTHSUFFR: youth suffrage

3. Data

For our analysis, two datasets were used. 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 (Alberta, British Columbia, Manitoba, New Brunswick, Newfoundland and Labrador, Nova Scotia, Ontario, Prince Edward Island, Quebec and Saskatchewan) and Canada as a whole while the time-series elements cover the eight elections of this period (1988, 1993, 1997, 2000, 2004, 2006, 2008 and 2011). The dataset consists of 88 observations.

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 (305, 2003 Representation Order) and the time-series data cover the four elections since the last redistribution of the electoral districts (2004, 2006, 2008 and 2011). It consists of 1220 observations.

Table 2 displays all the Canadian federal elections which took place during the period 1988-2011.

Table 2: Canadian Federal Elections (1988 - 2011)

	Election date	Turnout
34th	November 21, 1988	75.30%
35th	October 25, 1993	69.60%
36th	June 2, 1997	67.00%
37th	November 27, 2000	61.20%
38th	June 28, 2004	60.90%
39th	January 23, 2006	64.70%
40th	October 14, 2008	58.80%
41st	May 2, 2011	61.10%

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.

The empirical analysis includes a variety of political and socioeconomic explanatory variables. The political determinants which are examined are closeness, election expenses per elector and incumbency.

Initially, closeness is measured as the ex-post percentage gap between the first and the second party. Specifically, it is the difference between the first party and the runner-up divided by the sum of the votes of these two parties in each province and for each electoral cycle or the difference of the first two candidates in district-level data. As it was mentioned, it is expected an inverse relation between closeness and voter turnout. However, the variable of closeness is endogenous with the error term as this may be affected by the turnout rate. So, we re-estimate our models using a proxy for the margin. Specifically, the variable of closeness is estimated using OLS with a set of explanatory variables and then the ex-post measure closeness is replaced with the estimated values. Among the independent variables, the election expenses limits and the number of the candidates are included.

Election expenses are defined as the provincial or district total expenses per elector (in 2002 Canadian dollars) in each election year. In particular, the election expenses of each candidate in each federal electoral district have been added in order to calculate the total expenses in each province. They have been converted into real terms using the Consumer Price Index. Election expenses are divided into seven categories: radio and television advertising, other advertising, election surveys or other surveys or research, office expenses (rent, heat and light), other office expenditures (other, including telephone), salaries and wages and miscellaneous expenses. It would be expected to have a positive influence on turnout as when the expenses are increasing it is easier for the voters to be informed, lowering the information costs.

According to the Canada Elections Act, each candidate's expenditures are subject to a limit. This limit varies, depending on the federal electoral district. It is determined by a complicated formula provided in section 441 of the Act which consists of the

number of electors and the area in square kilometers of each federal electoral district. In areas with low population density, less than 10 electors per square kilometer, there is an extra bonus too. The election expenses' limits are calculated by the following formula (Milligan & Rekkas, 2008).

$$Limit = f(electors) + Bonus \quad (1)$$

$$f(electors) = \$2.07 \times \min(15000, electors) + \$1.04 \times \min(10000, \max(0, electors - 15000)) + \$0.52 \times \max(0, electors - 25000) \quad (2)$$

$$Bonus = \min(0.25 \times f(electors), \$0.31 \times Area) \quad (3)$$

According to this formula, in districts with less than 15000 electors, \$2.07 is awarded per elector, for districts with the number of electors varying from 15000 to 25000 an additional of \$1.04 per voter is awarded while for each elector over 25000 electors an extra \$0.52 is assigned. The bonus for the areas with low population density is calculated as the minimum value of the 25% of the base limit or \$0.31 for every square kilometer in the district.

Under the Canada Elections Act, each candidate who receives up to a specific percentage of votes in his district receives a reimbursement of his expenses. During the period 1974–1983, candidates with at least 15% of the votes in their district received a reimbursement which varied according to a formula. In 1984–2000, the reimbursement threshold remained the same, 15%, but its size was set at 50% of the candidates' campaign expenditures. Finally, from 2004, the threshold is at 10% of the votes while the reimbursement size is at 60%.

In order to include the effect of incumbency on voter turnout, a dummy variable was constructed. In provincial-level data, the variable takes the same values for all the provinces and for Canada as a whole. Specifically, it takes the value 1 if the prime minister seeks for re-election and 0 otherwise while in district-level data, it takes the value 1 if the incumbent seeks for re-election and 0 otherwise. The sign of incumbency is ambiguous. In some cases, it can discourage the challengers causing a decline in voter turnout. On the other hand, incumbents can attract more contributors and as a result mobilize more voters. (Jacobson, 1978)

The socioeconomic factors which are examined are the demographic structure, the population density, the education, the income, the gini coefficient and the unemployment rate. If the elections were conducted during the first six months of the year, the socioeconomic data were drawn from the previous year for the provincial-level data. For the districts, the data for the demographic structure and the population density were taken from the censuses of 2001, 2006 and 2011. For the variables of education, income and unemployment, the data were available only for the censuses of 2001 and 2006. So, the values are the same for the three out of the four elections. For this reason, the models are estimated two times, the second one using the provincial-level data for these variables. Finally, for the gini coefficient, the provincial-level values are used as there are no data in district-level.

Two demographic variables are included. The first one is the demographic structure which captures the percent of the population 65 years and over to the voting-age population, i.e. the number of residents who are 18 years and over. Older people are more likely to vote, so it is expected a positive relation with voter turnout. Population density depicts the number of residents per square kilometer in Canada and in each province or district. The sign of population density is ambiguous. According to Geys (2006), in cities with greater population density, lower rates of turnout are expected as there is no “social pressure”. On the other hand, there are lower information costs, which may urge voters to turnout.

As a proxy for education we include the percentage of the population in each province or district that is 25 years and over and have completed high school. A positive relationship between education and voter turnout is expected.

Income is the median total income, by economic family type (including all family units), in 2010 constant Canadian dollars for provincial-level data and in 2002 constant Canadian dollars in district-level data. The expected sign of income is equivocal. Another economic variable which is examined is the gini coefficient, a measure of income inequality. If it is equal to zero there is perfect equality, whereas a gini coefficient of one indicates maximal inequality. In our research, it is measured as the gini coefficient of market taking into account the after-tax income of individuals, where everyone is represented by their adjusted household income, by economic

family type (including all family units). A negative relationship between gini coefficient and voter turnout is expected.

The impact of annual average unemployment rate in provinces and districts is examined too. The expected sign of unemployment is also ambiguous.

Elections' data were drawn from Elections Canada. Specifically, turnout measures for the election cycles during the period 1988-2011 as well as closeness measures in provincial-level for the period 1997-2011 were obtained from the Report of the Chief Electoral Officer of Canada. Expenses' data were taken from the Report of the Chief Electoral Officer Respecting Election Expenses, 1993 to 2011 (accessed June, 2012) while the expenses for the election year of 1988 were taken from professor's Filip Palda website. Incumbency data for all the election cycles and closeness measures for the years 1988 and 1993 and for all the years in district-level data were obtained from Parliament of Canada.

The provincial-level socioeconomic data were taken from Statistics Canada while the district-level socioeconomic data were drawn from the censuses of 2001, 2006 and 2011.

The descriptive statistics for all the variables examined are reported in Tables 3, 4 and 5.

Table 3: Descriptive Statistics of voter turnout per region

Region	Mean	Max	Min	Std. Dev.
Alberta	60.99	75	52.4	6.83
British Columbia	65.36	78.7	60.1	5.93
Manitoba	62.93	74.7	56.1	6.22
New Brunswick	68.46	75.9	62.8	4.63
Newfoundland & Labrador	55.1	67.1	47.7	5.92
Nova Scotia	65.04	74.8	60.3	4.77
Ontario	64.3	74.6	58	5.49
Prince Edward Island	73.74	84.9	69	4.76
Quebec	67.34	77.1	60.5	6.69
Saskatchewan	65.1	77.8	58.7	6.2
Canada	64.83	75.3	58.8	5.56

Table 4: Descriptive Statistics of independent variables in provincial-level

Variable	Mean	Max	Min	Std. Dev.	Obs.
Closeness	20.36	67.18	0.12	15.38	88
Expenses per elector	0.89	2.51	0.26	0.4	88
Incumbency	0.75	1	0	0.44	88
Demographic structure	16.9	20	11.8	1.89	88
Population density	7.8	24.7	1.4	6.97	88
Education	18.58	26.05	12.87	2.79	88
Income	49238.64	71100	40800	6363.95	88
Gini coefficient	0.29	0.33	0.24	0.02	88
Unemployment	9.09	20.1	3.6	3.55	88

Table 5: Descriptive Statistics of the district-level variables

Variable	Mean	Max	Min	Std. Dev.	Obs.
Turnout	61.29	77.00	35.82	6.02	1220
Closeness	27.15	83.55	0.03	19.46	1220
Expenses per elector	1.53	5.14	0.00	0.69	1220
Limit of expenses	75804.39	111866.60	55743.92	6286.79	1220
Incumbency	0.82	1.00	0.00	0.38	1220
Demographic structure	17.84	30.08	6.61	4.14	1220
Population density	1259.97	11639.60	0.10	1984.98	1220
Education (census)	22.29	29.12	9.87	3.55	1220
Income (census)	56758.04	70789.47	42748.09	5178.37	1220
Unemployment (census)	7.20	30.20	2.80	3.53	1220
Education (provincial-level)	18.67	21.58	13.73	2.53	1220
Income (provincial-level)	57955.41	91832.42	34065.84	11080.50	1220
Unemployment (provincial-level)	7.27	16.40	3.60	1.96	1220
Gini coefficient	0.31	0.33	0.26	0.01	1220
Candidates	5.29	11	3	1.12	1220

4. Methodology

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

$$y_{it} = \alpha + \beta x'_{it} + \mu_i + \varepsilon_{it}, \quad (i=1, \dots, N, t=1, \dots, T) \quad (4)$$

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, μ_i is the individual effect which affects y_{it} cross-sectionally but it is time-invariant and ε_{it} 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 primary advantage of a panel data model over a cross-sectional data set is that it allows greater flexibility in modeling differences in behavior across individuals (Greene, 2000).

There are a lot of panel data techniques. The two main techniques which are used in this analysis are the fixed effects model and the random effects model. These two models differ in how they treat the individual effect. Moreover, the Hausman test statistic is used in order to evaluate the best model.

4.1 The Fixed Effects Model

The fixed effects model treats μ_i of equation (4) as a fixed but unknown constant which differs across individuals. The individual effect is correlated with the included variables x_{it} , $Cov(x_{it}, \mu_i) \neq 0$, so, the OLS estimator of β is biased and inconsistent.

An alternative way to estimate this regression is to transform it by subtracting the time-mean of each element from each value of the variable. This transformation is called the within transformation and it removes the unobserved effects. The equation takes the following form

$$y_{it} - \bar{y}_i = \beta(x_{it} - \bar{x}_i)' + \varepsilon_{it} - \bar{\varepsilon}_i \quad (5)$$

where $\bar{y}_i = \frac{1}{T} \sum_{t=1}^T y_{it}$, $\bar{x}_i = \frac{1}{T} \sum_{t=1}^T x_{it}$ and $\bar{\varepsilon}_i = \frac{1}{T} \sum_{t=1}^T \varepsilon_{it}$.

The OLS estimator for β is called within or fixed effects estimator and it is unbiased. It is given by the following equation.

$$\hat{\beta}_{FE} = \left(\sum_{i=1}^N \sum_{t=1}^T (x_{it} - \bar{x}_i)(x_{it} - \bar{x}_i)' \right)^{-1} \sum_{i=1}^N \sum_{t=1}^T (x_{it} - \bar{x}_i)(y_{it} - \bar{y}_i) \quad (6)$$

4.2 The Random Effects Model

In the Random Effects model the individual effects are assumed to be random and uncorrelated rather than fixed. The μ_i has an *i.i.d.* distribution, $\mu_i \sim (0, \sigma_\mu^2)$, and it is uncorrelated both with the error term, $\varepsilon_{it} \sim i.i.d.(0, \sigma_\varepsilon^2)$, and with the independent variables, x_{it} , $Cov(\mu_i, x_{it}) = 0$.

This equation cannot be estimated using the OLS method because the OLS estimator is unbiased and consistent. Instead, a generalized least squares (GLS) method is used.

The GLS estimator for β can be computed by the following expression

$$\begin{aligned} \hat{\beta}_{GLS} = & \left(\sum_{i=1}^N \sum_{t=1}^T (x_{it} - \bar{x}_i)(x_{it} - \bar{x}_i)' + \psi T \sum_{i=1}^N (\bar{x}_i - \bar{x})(\bar{x}_i - \bar{x})' \right)^{-1} \\ & \times \left(\sum_{i=1}^N \sum_{t=1}^T (x_{it} - \bar{x}_i)(y_{it} - \bar{y}_i) + \psi T \sum_{i=1}^N (\bar{x}_i - \bar{x})(\bar{y}_i - \bar{y}) \right) \end{aligned} \quad (7)$$

where $\bar{x} = \frac{1}{NT} \sum_{i,t} x_{it}$ and $\psi = \frac{\sigma_\varepsilon^2}{\sigma_\varepsilon^2 + T\sigma_\mu^2}$.

Another way to compute the GLS estimator is by computing the OLS estimator in the following transformed model

$$(y_{it} - \theta \bar{y}_i) = \alpha(1 - \theta) + \beta(x_{it} - \bar{x}_i)' + u_{it}, \quad \theta = 1 - \psi^{1/2} \quad (8)$$

With this method, it is subtracted a weighted mean from the variables and not the whole mean.

4.3 Fixed or Random Effects

Whether the Fixed or the Random Effects is the most appropriate model depends on the orthogonality of μ_i . If the unobserved error is uncorrelated with the independent variables, then the random effects model is the appropriate estimator whereas if it is correlated with the explanatory variables, the fixed effects estimator is more proper.

Hausman (1978) proposed a test in order to realize which of the two models is more appropriate. This test basically tests whether the fixed and the random effects estimators are significantly different. The Hausman test statistic is computed by the next expression

$$H = (\hat{\beta}_{FE} - \hat{\beta}_{RE})' \left[\text{Var}(\hat{\beta}_{FE}) - \text{Var}(\hat{\beta}_{RE}) \right]^{-1} (\hat{\beta}_{FE} - \hat{\beta}_{RE}) \sim \chi^2_K \quad (9)$$

It is distributed asymptotically as Chi-squared with K degrees of freedom, the number of elements in β , i.e. the number of the explanatory variables. Under the null hypothesis the random effects model is preferred.

5. Empirical Results

Table 6 displays the results of four models using the provincial-level data. In the first model, all the explanatory variables are included. In the second model, the incumbency variable is excluded while in the third one it is excluded the gini coefficient. Finally, in the fourth model, both incumbency and gini coefficient are excluded.

Similarly, Tables 7 and 8 show the results of these models using district-level data. As it was mentioned before, the district-level data for the socioeconomic factors were drawn from the censuses of 2001 and 2006, so, the variables of education, income and unemployment have the same values for the three out of the four elections. For this reason, each model was estimated two times using the provincial-level data (Models 5(a), 6(a), 7(a) and 8(a)) and the censuses district-level data (Models 5(b), 6(b), 7(b) and 8(b)) for these variables.

Table 6: Results of Provincial-level Data

	Model 1		Model 2		Model 3		Model 4	
	Fixed Effects	Random Effects	Fixed Effects	Random Effects	Fixed Effects	Random Effects	Fixed Effects	Random Effects
Independent Variables	Dependent Variable: Turnout							
Closeness	-0.098 [-3.244]***	-0.093 [-3.152]***	-0.120 [-3.807]***	-0.117 [-3.811]***	-0.106 [-3.414]***	-0.098 [-3.243]***	-0.134 [-4.080]***	-0.126 [-3.964]***
Expenses per Elector	4.039 [4.282]***	3.943 [5.011]***	4.094 [4.035]***	3.706 [4.434]***	3.814 [3.899]***	4.457 [5.705]***	3.824 [3.590]***	4.247 [5.076]***
Incumbency	2.894 [3.442]***	2.696 [3.286]***	-	-	3.239 [3.744]***	2.936 [3.472]***	-	-
Demographic Structure	-1.006 [-2.395]***	-0.925 [-2.467]**	-1.099 [-2.437]**	-0.999 [-2.520]**	-1.320 [-3.150]***	-1.229 [-3.427]***	-1.501 [-3.311]***	-1.327 [-3.493]***
Population Density	0.406 [0.423]	0.237 [1.131]	0.990 [0.975]	0.274 [1.296]	-0.735 [-0.826]	0.329 [1.869]*	-0.333 [-0.347]	0.375 [2.118]**
High School Education	0.864 [2.446]***	0.895 [2.962]***	0.953 [2.516]**	0.880 [2.749]***	1.050 [2.914]***	1.240 [4.364]***	1.196 [3.067]***	1.230 [4.056]***
Median Income	0.0002 [1.870]*	0.0002 [1.493]	0.0003 [2.028]**	0.0002 [1.605]	0.0002 [1.795]*	0.0001 [0.993]	0.0003 [1.962]*	0.0001 [1.041]
Unemployment	0.811 [2.786]***	0.568 [2.242]**	0.472 [1.602]	0.298 [1.157]	1.175 [4.421]***	0.839 [3.655]***	0.879 [3.165]***	0.587 [2.489]**
Gini coefficient	-108.225 [-2.615]***	-120.219 [-3.551]***	-130.522 [-2.969]***	-133.745 [-3.725]***	-	-	-	-
Constant	66.944 [3.520]***	75.143 [4.454]***	72.557 [3.559]***	84.554 [4.783]***	43.004 [2.477]**	37.125 [3.005]***	43.783 [2.316]**	43.382 [3.335]***
Adjusted R^2	0.831		0.805		0.817		0.783	
F-statistic	23.531***	27.334***	20.895***	25.853***	22.550***	23.450***	19.437***	21.933***
Akaike	5.149		5.287		5.222		5.384	

t-statistics are in parentheses, *, **, *** indicate significance at the 10%, 5%, 1% level for two-tailed tests respectively

Table 7: Results of District-level Data: Basic Model

	Model 5(a)		Model 5(b)		Model 6(a)		Model 6(b)	
	Fixed Effects	Random Effects	Fixed Effects	Random Effects	Fixed Effects	Random Effects	Fixed Effects	Random Effects
Independent Variables	Dependent Variable: Turnout							
Closeness	-0.020 [-3.586]***	-0.026 [-4.685]***	-0.037 [-4.845]***	-0.041 [-6.036]***	-0.021 [-3.621]***	-0.026 [-4.688]***	-0.037 [-4.846]***	-0.038 [-5.586]***
Expenses per Elector	1.114 [7.136]***	0.841 [5.609]***	1.855 [9.540]***	1.909 [10.755]***	1.081 [6.909]***	0.752 [5.012]***	1.841 [9.377]***	1.850 [10.239]***
Incumbency	1.075 [5.531]***	1.187 [6.214]***	0.675 [2.643]***	0.485 [1.971]**	1.062 [5.442]***	1.202 [6.265]***	0.680 [2.636]***	0.593 [2.380]**
Demographic Structure	0.588 [8.903]***	0.427 [8.828]***	0.156 [1.849]*	0.445 [9.091]***	0.608 [9.196]***	0.453 [9.361]***	0.163 [1.922]*	0.407 [7.935]***
Population Density	0.0006 [0.820]	-6.21E-05 [-0.4333]	-0.001 [-1.222]	-8.40E-05 [-0.731]	0.001 [0.799]	-0.0001 [-0.851]	-0.001 [-1.535]	-0.0002 [-1.993]**
High School Education	3.374 [19.885]***	1.627 [14.585]***	0.077 [1.551]	0.020 [0.481]	3.342 [19.640]***	1.307 [12.915]***	0.057 [1.132]	-0.039 [-0.905]
Median Income	-0.001 [-17.878]***	-0.001 [-16.731]***	0.0002 [2.801]***	0.0002 [9.816]***	-0.001 [-18.759]***	-0.001 [-18.468]***	0.0002 [2.424]**	0.0002 [7.211]***
Unemployment	-0.309 [-3.294]***	-0.282 [-3.380]***	-0.194 [-1.419]	-0.288 [-4.109]***	-0.386 [-4.254]***	-0.437 [-5.433]***	-0.216 [-1.568]	-0.291 [-3.942]***
Gini coefficient	-57.409 [-3.086]***	-103.850 [-6.666]***	-105.117 [-4.475]***	-119.918 [-8.279]***	-	-	-	-
Constant	37.239 [5.799]***	83.414 [18.933]***	78.642 [9.348]***	75.642 [16.670]***	21.458 [5.498]***	60.415 [21.983]***	48.390 [9.771]***	44.307 [16.995]***
Adjusted R^2	0.865		0.767		0.864		0.762	
F-statistic	25.948***	70.086***	13.790***	46.161***	25.758***	72.021***	13.495***	39.567***
Akaike	4.643		5.191		4.652		5.210	

Notes: In Models 5(a) & 6(a) the education, the income and the unemployment are in provincial-level while in Models 5(b) & 6(b) they are in district-level (censuses). t-statistics are in parentheses, *, **, *** indicate significance at the 10%, 5%, 1% level for two-tailed tests respectively

Table 8: Results of District-level Data: Basic Model

	Model 7(a)		Model 7(b)		Model 8(a)		Model 8(b)	
	Fixed Effects	Random Effects	Fixed Effects	Random Effects	Fixed Effects	Random Effects	Fixed Effects	Random Effects
Independent Variables	Dependent Variable: Turnout							
Closeness	-0.017 [-2.873]***	-0.022 [-3.995]***	-0.035 [-4.570]***	-0.039 [-5.860]***	-0.017 [-2.198]***	-0.022 [-3.990]***	-0.035 [-4.573]***	-0.037 [-5.359]***
Expenses per Elector	1.033 [6.541]***	0.752 [4.963]***	1.806 [9.299]***	1.872 [10.573]***	1.002 [6.334]***	0.661 [4.364]***	1.792 [9.137]***	1.803 [10.006]***
Demographic Structure	0.659 [9.998]***	0.475 [9.860]***	0.196 [2.365]**	0.463 [9.566]***	0.677 [10.272]***	0.502 [10.417]***	0.205 [2.438]**	0.428 [8.438]***
Population Density	0.001 [1.246]	-2.76E-05 [-0.192]	-0.001 [-1.007]	-6.43E-05 [-0.561]	0.009 [1.219]	-8.78E-05 [-0.609]	-0.001 [-1.322]	-0.0002 [-1.808]*
High School Education	3.376 [19.576]***	1.603 [14.227]***	0.088 [1.773]*	0.030 [0.702]	3.344 [19.352]***	1.279 [12.541]***	0.068 [1.354]	-0.028 [-0.654]
Median Income	-0.001 [-17.299]***	-0.001 [-15.855]***	0.0002 [2.919]***	0.0003 [9.976]***	-0.001 [-18.159]***	-0.001 [-17.587]***	0.0002 [2.542]**	0.0002 [7.340]***
Unemployment	-0.340 [-3.571]***	-0.288 [-3.412]***	-0.202 [-1.474]	-0.285 [-4.067]***	-0.413 [-4.495]***	-0.445 [-5.463]***	-0.225 [-1.623]	-0.289 [-3.889]***
Gini coefficient	-55.235 [-2.923]***	-104.863 [-6.645]***	-105.394 [-4.422]***	-121.505 [-8.382]***	-	-	-	-
Constant	35.430 [5.437]***	83.118 [18.667]***	77.654 [9.209]***	75.778 [16.666]***	20.260 [5.120]***	59.907 [21.585]***	47.314 [9.555]***	43.945 [16.818]***
Adjusted R^2	0.861		0.765		0.859		0.760	
F-statistic	25.113***	72.207***	13.721***	51.411***	24.959***	75.069***	13.428***	44.227***
Akaike	4.675		5.197		4.682		5.216	

Notes: In Models 5(a) & 6(a) the education, the income and the unemployment are in provincial-level while in Models 5(b) & 6(b) they are in district-level (censuses). t-statistics are in parentheses, *, **, *** indicate significance at the 10%, 5%, 1% level for two-tailed tests respectively

Regarding the political factors which are examined, it is observed that all are statistically significant in all the models. Furthermore, the impact of ex-post closeness and election expenses is the expected.

Specifically, 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. The participation of the voters in the election process is decreasing as the margin between the candidates is increasing. The sign of the coefficient is the expected since the larger the difference, the less likely one vote to induce major changes in the election results. Therefore, the voters prefer to abstain since the costs outweigh the benefits.

On the contrary, the candidates' expenses per elector have a positive impact on the participation rate. The citizens go to the polls in a greater proportion when the total expenses of the candidates are increasing. Increased expenditures means more campaigns in order to inform the voters. So, the voters have the opportunity to be informed about the elections and the positions of the candidates with less information costs.

Incumbency's sign, according to the literature, may be ambiguous. However, according to our results, it affects voter turnout in a positive way, indicating that if a candidate seeks for re-election, more voters go to the polls.

Concerning the socioeconomic factors, in some cases the results are different between the provincial and the district-level data.

The rate of the citizens above 65 years to the voting-age population, i.e. above 18, has a positive relationship with voter turnout in district-level data. In other words, the elderly are more interested about the elections, and they participate at a higher rate compared to the younger. The sign of the coefficient is the expected because, as it was mentioned, older voters have more time and fewer opportunity costs. Additionally, many policies target on them. On the contrary, when examining provincial-level data their relationship is negative, something that is unexpected.

The number of the residents per squared kilometer does not give statistically significant results. Consequently, whether an area is urban or rural does not affect whether the citizens will exercise their right to vote.

The rate of the voters who have completed the high school has a positive influence on voter turnout. They participate in greater numbers as they can get the information and process it with less cost. The results are not statistically significant only in district-level data using the censuses' data for the socioeconomic variables.

Concerning the median family income, it has a negative coefficient in district-level data using the provincial data for the socioeconomic factors, meaning that people with higher income may be better informed but their costs from participating outweigh the benefits. So, they prefer to abstain. On the other hand, in the fixed effects models of the provincial-level data and in the district-level data using the data from the censuses, the results are positive, indicating that citizens with lower income do not participate in the elections as they may consider that the elections will not make any difference. However, the income inequality seems to affect the voter turnout rate in a negative way in all the cases, confirming the theory that greater income inequality is associated with a lower turnout rate.

Finally, the unemployment rate is negatively associated to electoral participation in district-level data verifying Chapman and Palda (1983) who support that unemployed are usually less educated, and they have more costs in acquiring and processing information. In provincial-level data, it seems that the unemployment rate has a positive relationship with voter turnout signifying that the people who are out of work participate in the election process trying to change the existing situation.

In a nutshell, in all the models, the political variables are statistical significant and seem to have the same impact on voter turnout. At the same time, the impact of the socioeconomic variables seems to differ significantly between district and provincial-level. However, in provincial-level data, there are only 88 observations, which make our estimations less reliable.

The Hausman test statistic is employed in our models in order to evaluate whether the fixed or the random effects model is more appropriate. The results are presented in Table 9. In the first three models of the provincial-level data, the null hypothesis is accepted meaning that the random effects model is the best. For the rest of the estimations, the null hypothesis is rejected indicating that the random effects are not uncorrelated with the explanatory variables, so, it is preferred the fixed effects model.

Table 9: Hausman Test Statistic

	χ^2	χ^2 d.f.	Prob
Model 1	0.000	9	1.000
Model 2	5.641	8	0.687
Model 3	0.000	8	1.000
Model 4	14.363	7	0.045
Model 5(a)	249.068	9	0.000
Model 5(b)	42.414	9	0.000
Model 6(a)	278.249	8	0.000
Model 6(b)	39.367	8	0.000
Model 7(a)	249.487	8	0.000
Model 7(b)	37.177	8	0.000
Model 8(a)	278.974	7	0.000
Model 8(b)	34.109	7	0.000

As it was mentioned, the measure of the ex-post closeness may be affected by the voter turnout rate. So, the models 7(a) and 8(a) are re-estimated using proxies for the closeness variable. Initially, the ex-post measure of closeness is estimated by OLS using as explanatory variables the lags of the statistical significant variables of the models 7(a) and 8(a), i.e. the population density is excluded. It is also estimated adding as an independent variable the number of the candidates in each district and, finally, the limit of the election expenses per district is added too. The results of these estimations are displayed in Tables 10 and 11.

Table 10: Results of District-level Data

Independent Variables	Model 9(a)		Model 9(b)		Model 9(c)	
	Fixed Effects	Random Effects	Fixed Effects	Random Effects	Fixed Effects	Random Effects
	Dependent Variable: Turnout					
$\widehat{\text{Closeness}}$	-0.102 [-3.256]***	-0.015 [-1.599]	-0.102 [-3.276]***	-0.014 [-1.496]	-0.149 [-5.257]***	-0.020 [-2.084]**
Expenses per Elector	1.160 [7.634]***	1.162 [8.062]***	1.159 [7.632]***	1.163 [8.063]***	1.093 [7.287]***	1.151 [7.974]***
Demographic Structure	0.369 [4.90]***	0.212 [3.939]***	0.370 [4.496]***	0.211 [3.929]***	0.368 [4.549]***	0.212 [3.938]***
Population Density	-0.001 [-0.876]	-7.91E-05 [-0.553]	-0.001 [-0.876]	-8.15E-05 [-0.569]	-0.001 [-0.701]	-8.82E-05 [-0.617]
High School Education	3.503 [14.31]***	1.480 [13.144]***	3.503 [14.314]***	1.478 [13.135]***	3.329 [13.577]***	1.476 [13.127]***
Median Income	-0.001 [-24.296]***	-0.001 [-27.341]***	-0.001 [-3.221]***	-0.001 [-27.314]***	-0.001 [-24.674]***	-0.001 [-27.128]***
Unemployment	-0.323 [-3.215]***	-0.300 [-3.745]***	-0.324 [-3.221]***	-0.300 [-3.753]***	-0.354 [-3.563]***	-0.298 [-3.730]***
Gini coefficient	-43.006 [-2.395]**	-90.294 [-6.465]***	-42.925 [-2.391]**	-90.215 [-6.459]***	-34.970 [-1.964]**	-90.380 [-6.478]***
Constant	53.706 [5.912]***	107.010 [24.765]***	53.699 [5.912]***	107.041 [24.785]***	56.006 [6.251]***	107.002 [24.793]***
Adjusted R^2	0.914		0.914		0.916	
F-statistic	31.940***	154.73***	31.947***	153.899***	32.882***	154.391***
Akaike	4.293		4.292		4.265	

Notes: In Model 9(a) Closeness has been estimated with the lags of the statistical significant variables of Model 7(a), in Model 9(b) it has been added the number of the candidates while in Model 9(c) it has been added the limit of the election expenses.

t-statistics are in parentheses, *, **, *** indicate significance at the 10%, 5%, 1% level for two-tailed tests respectively

Table 11: Results of District-level Data

	Model 10(a)		Model 10(b)		Model 10(c)	
	Fixed Effects	Random Effects	Fixed Effects	Random Effects	Fixed Effects	Random Effects
Independent Variables	Dependent Variable: Turnout					
$\widehat{\text{Closeness}}$	-0.098 [-3.142]***	-0.011 [-1.145]	-0.100 [-3.159]***	-0.010 [-1.068]	-0.159 [-5.648]***	-0.015 [-1.603]
Expenses per Elector	1.130 [7.451]***	1.077 [7.470]***	1.130 [7.450]***	1.078 [7.469]***	1.050 [7.040]***	1.067 [7.391]***
Demographic Structure	0.407 [5.037]***	0.241 [4.468]***	0.407 [5.041]***	0.241 [4.462]***	0.405 [5.127]***	0.240 [4.463]***
Population Density	-0.001 [-0.734]	-0.0001 [-0.865]	-0.001 [-0.735]	-0.0001 [-0.877]	-0.001 [-0.588]	-0.0001 [-0.919]
High School Education	3.676 [15.559]***	1.233 [11.580]***	3.676 [15.558]***	1.231 [11.572]***	3.441 [14.483]***	1.228 [11.561]***
Median Income	-0.001 [-24.230]***	-0.001 [-29.672]***	-0.001 [-24.232]***	-0.001 [-29.582]***	-0.001 [-24.753]***	-0.0001 [-29.476]***
Unemployment	-0.393 [-4.089]***	-0.454 [-5.904]***	-0.393 [-4.093]***	-0.454 [-5.904]	-0.422 [-4.470]***	-0.453 [-5.893]***
Constant	36.834 [6.168]***	87.031 [28.654]***	36.855 [6.173]***	87.049 [28.661]***	43.256 [7.198]***	87.045 [28.712]***
Adjusted R^2	0.913		0.913		0.916	
F-statistic	31.700***	165.801***	31.702***	165.665***	32.905***	165.783***
Akaike	4.302		4.302		4.267	

Notes: In Model 10(a) $\widehat{\text{Closeness}}$ has been estimated with the lags of the statistical significant variables of Model 8(a), in Model 10(b) it has been added the number of the candidates while in Model 10(c) it has been added the limit of the election expenses.

t-statistics are in parentheses, *, **, *** indicate significance at the 10%, 5%, 1% level for two-tailed tests respectively

It is observed that the results, concerning the fixed effects model, are the same whether it is included the ex-post measure of closeness or the estimated measure of it. The population density variable remains non-significant while all the other variables give statistically significant results, and their influence on the voter turnout rate is of the same direction. The only difference is that in the random effects model, the variable of closeness does not give statistically significant results anymore.

Table 12 presents the results of the Hausman test statistic for the Models 9 and 10.

Table 12: Hausman Test Statistic

	χ^2	χ^2 d.f.	Prob
Model 9(a)	220.852	8	0.000
Model 9(b)	221.793	8	0.000
Model 9(c)	221.273	8	0.000
Model 10(a)	247.095	7	0.000
Model 10(b)	247.267	7	0.000
Model 10(c)	248.480	7	0.000

In all the cases, it is rejected the null hypothesis indicating that the fixed effects model is more proper.

Coefficient Diagnostics

Table 13 reports the results of the Wald test statistics for the Models 7(a) and 9(c) which, according to the adjusted R-squared, the F-statistic and the Akaike information criterion, are the best models. The Wald test statistic, $W_j(\text{d.f.})$, is distributed as $\chi^2(\text{d.f.})$ and examines whether each coefficient is equal to zero. The only case that the null hypothesis is accepted is the population density variable. For all the other coefficients, the null hypothesis that they are equal to zero is rejected.

Table 13: Wald Test Statistic

	Model 7(a)	Model 9(c)
(ex-post) Closeness	$W_1(1)=8.253$ [0.004]	$W_1(1)=27.640$ [0.000]
Expenses per Elector	$W_2(1)=42.782$ [0.000]	$W_2(1)=53.105$ [0.000]
Demographic Structure	$W_3(1)=99.968$ [0.000]	$W_3(1)=20.695$ [0.000]
Population Density	$W_4(1)=1.552$ [0.213]	$W_4(1)=0.492$ [0.483]
High School Education	$W_5(1)=383.217$ [0.000]	$W_5(1)=184.328$ [0.000]
Median Income	$W_6(1)=299.248$ [0.000]	$W_6(1)=608.812$ [0.000]
Unemployment	$W_7(1)=12.755$ [0.000]	$W_7(1)=12.696$ [0.000]
Gini coefficient	$W_8(1)=8.543$ [0.004]	$W_8(1)=3.856$ [0.049]

Notes: The numbers in square brackets are the p-values

6. Conclusions

The objective of this study was to investigate the political and socioeconomic factors that mobilize the Canadian citizens to go to the polls in order to cast their ballot. For that reason, we used panel data techniques, estimating both with the fixed and the random effects model. For our estimations, we used two datasets. The first dataset used provincial-level data for the Canadian federal elections that were conducted during the period 1988-2011 and the second one employed district-level data for the period 2004-2011.

For our estimations we used two measures of closeness. Initially, it was used the ex-post difference between the first two candidates. However, this variable is endogenous since it may be affected by the voter turnout rate. For that reason, we estimated an expected value of closeness as well. Nevertheless, the results are the same. According to our estimations, most of the factors which are examined provide results that are consistent with the literature. The political factors give statistically significant results in all the cases. The (ex-post) margin seems to affect the voter turnout rate in a negative way verifying the Rational Choice Theory that argues that citizens vote if only there is a chance to influence the outcome. On the other hand, the election expenses per elector and whether the incumbency seeks for re-election have a positive relation with the electoral participation. Concerning the socioeconomic factors, the results are a bit different between the two datasets. However, the

provincial-level data include only 88 observations, which make the results less reliable. In district-level data, the estimations for the demographic structure, the level of educational attainment and the unemployment rate are in consistence with the Canadian literature which is presented in this thesis. The median family income has a negative coefficient in agreement with some of these studies. Finally, the population density variable gives non-significant results in contrast with the estimations of Endersby et al. (2002).

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