Voter Turnout and Income Inequality in Canada *

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This paper explores the determinants of political participation in Canada by investigating the relation between income inequality and voter turnout at the Federal Electoral District level. Using recently-published data from the Canadian government, its results provide robust evidence for the existence of a substantial negative relationship between both variables, and show that districts with higher levels of inequality have lower turnout rates. Linear regression models also reveal that voter turnout is positively influenced by the proportion of the total income of a district coming from pension funds and, to a lesser extent, investment revenues. The proportion of income earned by women also matter and is associated with a positive effect on turnout rates, a finding which reflects recent evidence showing that women active in the labour market have higher turnout rates than men during Canadian elections.

Keywords: inequality, income, participation, turnout

Introduction

There is a lack of research on the relationship between income inequality and voter turnout both in the Canadian context and at the sub-national level. While there are many cross-national analyses (Solt 2008, Blais 2016, Guvercin 2018) as well as an important body of research focusing on the United States or on Western European countries, the political implications of income inequality in Canada have only recently started attracting the attention of researchers. A recent study from the Institute for Research on Public Policy indicates that while income inequality has substantially increased over the past three decades in the country - in line with the average of OECD countries - it has remained relatively stable since the early 2000s (Green et al. 2016). Voter turnout followed an inverse trend, steadily declining since 1988 and remaining in the low-60s until the most recent election in 2015 where it increased to 68.5% (Elections Canada 2019a). While this increase in voter turnout rates can be regarded as beneficial to the health and legitimacy of the Canadian democracy, turnout rates among the 338 federal districts show important discrepancies, ranging from 54.8% in the district with the lowest voter turnout rate to 80.6% in the district with the highest political participation of constituents (Elections Canada 2019b).

The variation in inequality levels between Canadian provinces and regions is similarly substantial. With Canada being a highly decentralised federation where provinces enjoy a great deal of autonomy with respect to social policy, redistribution and resilience to economic shocks are not homogeneous across the country. Previous research has already shown that variation in inequality levels are largely attributable to provincial rather than federal transfers (Sealey & Anderson 2015). Scrutinising the political implications of inequality in the country, some studies have examined the relation between income inequality and voter turnout at the provincial level (Polacko 2017), but there has been no analysis conducted at a lower level administrative level. New data published by the government in 2017, the Federal Electoral District Statistics (FEDS), make such investigation at the federal electoral district level possible. Additionally to enabling the analysis at this subregional level, these data present several interesting characteristics when

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compared with census data. They aggregate information on every tax liable Canadian citizen[1] and have a narrower geographic scope, using the 338 federal electoral district rather than the 152 census metropolitan areas and agglomerations. Using these data and following insights from previous empirical research suggesting that electoral engagement is positively correlated with income (Blais 2000, Jaime-Castillo 2009), this paper aims to answer to the following question: can income inequality provide explanations for the variation in turnout rates between federal electoral districts in Canada?

Theoretical argument

The main theoretical argument used to underpin this research is relative power theory, which predicts a negative relationship between inequality and turnout (Solt 2008). This theory attempts to provide explanations to the puzzle surrounding the reasons why citizens are not going to the polls and using their political rights to affect income distribution and other policies that could benefit them. According to this theory, the fact that income distribution - unlike political rights - is unequally distributed across the population hinders the political participation of citizens and reduces their motivation to vote. Increasing levels of income inequality lead to a greater concentration of wealth in the hands of high-income individuals who can translate this increased wealth into greater political power (Polacko 2017). The concentration of power in the hands of well-off individuals allows them to wield more influence in the agenda-setting of legislative bodies, which in turn can contribute to redistribution issues being less debated (Solt 2008). The wealthier can therefore manipulate the political system for their own benefits, and less-off citizens refrain from voting since they know they have a very low probability of influencing the political process. The political participation of the well-off also decreases since they only need to participate at the minimum level required in order to maintain their dominant position in the political process (Seeber & Steinbrecher 2011). Relative power theory therefore predicts that inequality depresses the political participation of all income groups, an assumption contrasting with explanations provided by resource theory (Brady, Verba & Schlozman 1995) where turnout can be comprehended as a function of the available resources of individuals. This theory suggests that greater inequality and concentration of wealth in a society decrease the turnout rates of the poor but increase those of the well-off since the latter have more resources at their disposal in terms of money, education, time or political skills (Avery 2015)[2].

The relative power theory implies that political equality and political participation from citizens are best achieved when there is a more equal distribution of economic resources. Applying this theoretical framework to the Canadian sub-national context, we can derive two hypothesis guiding this paper: *H1 - Income inequality can explain the variation in turnout rates between federal electoral districts* and *H2 - Federal districts with higher levels of inequality have lower turnout rates*.

Methods

Three different sources of data have been used to define the variables: socio-economic data from the Federal Electoral District Statistics (FEDS) for the year 2015, data from the 2011 Census, and official voting results of the 2015 42nd General Election.

[1] In Canadian population censuses income data is gathered through a long-from questionnaire sent to a sample of 25% of Canadian households.

[2] With no turnout data disaggregated by income groups available at the electoral district level, testing such theory goes beyond the scope of this paper and provide further research possibilities.

The response variable in the models is voter turnout and consists of the official turnout rates in the 2015 Election published by Elections Canada. There is a plurality of definitions of 'turnout' in the vast body of research exploring the reasons why people vote in elections, and the operationalisation of this variable varies according to the type of ratio calculated. In most studies this ratio consists of the number of cast votes against the voting age population, the number of eligible voters or the number of voters registered (Geys 2006). This paper uses the ratio calculated by Elections Canada, which is obtained by dividing the total number of ballots cast by the number of electors on the electoral lists. In Canada, this list consists of the total voting age population of every district since every citizen qualified to vote in federal elections and referendums is automatically registered in the National Register of Electors. This particularity of the Canadian electoral landscape prevents methodological issues that can arise when relying on electoral lists based on voluntary registration of voters, which can lead to bias toward the wealthier segments of the population since they are expected to register in higher proportions than the less well-off (Jaime-Castillo 2009).

Independent variables mostly come from the FEDS dataset. They include information stemming from the tax year assessment or reassessment information for all tax returns, tax-free savings accounts records and summary returns sent by financial institutions. They also provide data on individual recipients of the Goods and Services Tax (GST) and the Harmonized Sales Tax (HST) credit and individual recipients of the Child Care Benefit (CCB). These tax-related data are further disaggregated by income type, age, and sex. Since the FEDS only offer one observation point (tax information for the year 2015), they cannot allow for a longitudinal analysis of the relationship between voter turnout and income inequality over multiple elections[3]. This analysis is therefore limited to the state of inequality in the country in 2015 and focus on the discrepancies in voter turnout between the 338 federal electoral districts observed during the 42nd General Election, held on 19 October 2015.

The first independent variable captures the inequality in every district by using the Gini coefficients derived from the income data included in the FEDS. These data consist of the pre-tax distribution of income at the district level and allow the computation of inequality by comparing the aggregated total number of households per income category. Control variables contain a diversity of measures. Socio-economic explanatory variables from the FEDS include data on income sources, the percentage of the population receiving tax credits and other social benefits, and age and gender variables. The age- and gender-disaggregated are used to determine the potential effect of variations in the proportion of youth/adult/senior citizens and of the proportion of female citizens and income earned by women on the turnout of every district.

Data from the 2011 census include the total population of every electoral district (including the non-voting age population) as well as their density and stability. The latter is captured by the percentage of private dwellings occupied by usual residents and informed by the idea that homeowners are more likely to reside in the same area for a longer period of time than renters and should consequently have more stake in the political outcome of elections (Geys 2006). Population density is the measurement of every district's population per km^2.

Official results from the 42nd election allow the use of the majority percentage of the winning candidate to identify the effect of the closeness of the electoral race on turnout. While this ex post measure of the vote gap does not capture the true *expected* closeness of the race by voters - as made possible by using survey data - it nevertheless provides an indication of the political dynamics of an electoral race. Considering that these political dynamics are communicated to voters through

[3]FEDS data are also available for the year 2014 but would be of limited use for this paper since the previous election was held in 2011.

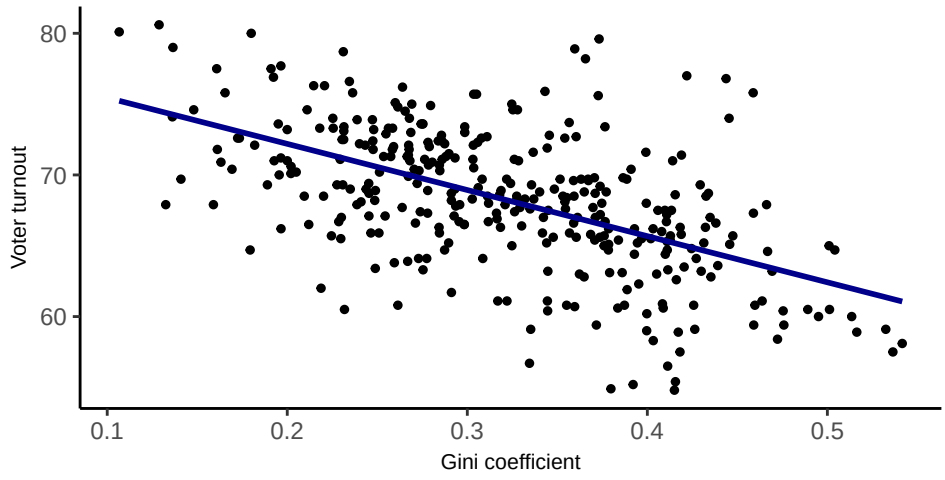
polling results during various stages of an electoral race, it can be argued that the closeness of the race reflected by this ex post measure is to a certain extent known by voters before and election and might influence turnout accordingly. A dummy variable indicating if the incumbent candidate of every district is a member of the Conservative Party of Canada (CPC) permits to determine if the voting in a particular district was driven by a desire for change after having a Conservative Prime Minister in power for close to ten years before this election.

Results

The first necessary step in developing the regression models was to select and calculate a measure of inequality. Using the available data, it was decided to compute the Gini coefficients of each electoral district. A Gini coefficient has a value between 0 and 1, where a score of 0 represents perfect equality and a score of 1 indicates that a single household receives all of the income of the unit of analysis (in our case the electoral district). Gini coefficients were firstly calculated[4] using the original distribution of income in 18 categories of the FEDS dataset, a process which yielded highly divergent results from measures of inequality in Canada calculated by other sources. Those categories were consequently merged into six distinct income categories with a 20,000$ interval (with the exception of the highest category capturing income over 100,000$) and Gini coefficients subsequently recalculated. This calculation provided more reliable results. According to this calculation, the range of the coefficients between the most unequal (0.54) and the most equal (0.11) district is 0.43, which reflects an important diversity in the inequality landscape across the country. The validity of those numbers was verified by comparing the coefficient for the country as a whole with data from the OECD, where it was observed that both coefficients yielded the same measure of 0.31 (OECD 2019). The correlation between the Gini coefficient and the voter turnout of every Federal Electoral District is plotted in **Figure 1** where it can be observed that increasing inequality seems to depress voter turnout.

Figure 1. Income inequality and voter turnout

2015 General Elections, by Federal Electoral District



[4]This calculation was done using the function 'Gini' from the 'ineq' package in R.

Two models were employed to determine the effect of income inequality on voter turnout[5]. The first model estimated the relation between the response variable and a plurality of socio-economic control variables. Those variables included the gini coefficient (expressed as a percentage to facilitate interpretation), the average income of a district's population, the relative percentage of its total income originating from pension, investment, self-employed, benefits and other types of income, the proportion of the total income earned by women, and the percentage of the voting age population categorised as 'youth' (15-34 years old). The second model added geographical and political variables by including the district total population (including the non-voting population), its population stability and density, the closeness of the electoral race, and the presence of a member of the conservative party as the incumbent candidate. Results from both models are presented in **Table 1**.

As displayed in **Table 1**, the two models yielded similar results[6]. In both models income inequality is shown to have a statistically significant and negative relationship on turnout in the electoral district. A 10% increase in the Gini coefficient of an electoral district is estimated to reduce the voter turnout by approximately 4.1% when controling for all variables (with a 95% confidence internal between 3.2% and 5.0%).

There are additional substantial and statistically significant relationships between turnout and other control variables. Interestingly, the strongest relationship with turnout is the proportion of pension income, where a 10% increase in pension income leads to a 4.4% increase in voter turnout. This variable consists of funds from various federal, provincial and private pension plans and can be interpreted as a proxy for the proportion of older citizens living in an electoral district. This intuition has been tested by including the percentage of senior citizens (over 65 years old) per district in a subsequent model and where a variance inflation factor (VIF) test confirmed their multicollinearity. With pension income showing a stronger relationship with turnout than the percentage of senior citizens, the latter variable was subsequently dropped in the final model. Similarly, higher proportions of income derived from investments also increase voter turnout, albeit to a lower magnitude than the previously mentioned variables. Assuming that households with investment revenues are composed of the wealthier segment of the population, this observation suggests that resources can be considered as predictors of political participation, as informed by insights from resource theory (Brady, Verba & Schlozman 1995). However, precisely capturing how the political particpation of different income groups react to increases or decreases in their resource endowment goes beyond the scope of this paper and would require turnout data on the individual level. The proportion of income coming from self-employed activities, which include net business, professional, commission, farming and fishing income, presents an interesting case. Having a positive relationship with the response variable and a magnitude only slighly lower than that of inequality in the first model, both the strength of the relation and its significance were dramatically reduced when controlling for other variables in the second model

The proportion of the total income earned by women also has a statistically significant positive relationship with the reponse variable, with every 10% increase in women income leading to a 2.9% increase in voter turnout. Contrary to the previous variables on pension income and senior citizens, the variable on female income cannot be linearly predicted from the proportion of the female population, and both variables are picking up different types of relationship with the response variable. According to our data, having women who are active in

[5]Replication materials are available on the author's Github account: github.com/brunosj.

[6]Models have been verified using goodness-of-fit, multicollinearity, heteroskedasticity and normality tests. Results available on Github.

Table 1: Regression Results

	Dependent variable:	
	turnout	
	(1)	(2)
Gini coefficient	-0.459^{***}	-0.408^{***}
	(0.043)	(0.047)
Pension income	0.397^{***}	0.438^{***}
	(0.053)	(0.074)
Investment income	0.153^{**}	0.160^{**}
	(0.068)	(0.076)
Self-employed income	0.432^{**}	0.286
	(0.180)	(0.183)
Benefits income	0.179	-0.177
	(0.191)	(0.208)
Other income	-0.236	-0.143
	(0.494)	(0.491)
Female income	0.330^{***}	0.286^{***}
	(0.103)	(0.107)
Female voting age population	-0.228	-0.192
	(0.213)	(0.224)
Youth (15-34 years old)	0.047	-0.154
	(0.139)	(0.164)
Total population		-0.00004
		(0.00003)
Population stability		-0.0001
		(0.0001)
Population density		0.0001
		(0.0002)
Closeness of electoral race		0.004
		(0.013)
CPC incumbent candidate		0.071
		(0.400)
Constant	71.237^{***}	79.721^{***}
	(8.875)	(9.628)
Observations	338	338
R^2	0.519	0.557
Adjusted R^2	0.506	0.538
Residual Std. Error	3.540 (df = 328)	3.423 (df = 323)
F Statistic	39.353^{***} (df = 9; 328)	29.020^{***} (df = 14; 323)
Note:		*p<0.1; **p<0.05; ***p<0.01

the labor force contributes to higher rates of turnout within a district, an observation in line with evidence from the last two federal elections showing that women tend to vote more than men when they are between 18-54 years but less once they are older than 65 years old (Elections Canada 2016).

Added geographical and political control variables to the model did not reveal other significant relationship with voter turnout. However, adding those controls enabled to increase the goodness of fit of the model and reduce its residual standard error. The district total population was included in the model to determine if the utility from voting decreases with the size of the population, which is not the case according the the results of this model. The population density of the electoral districts also fail to support the idea that population concentration reduces turnout, thereby suggesting that the so-called urban/rural divide does not play a role in political participation in Canadian elections. By the same token, the proportion of private dwellings occupied by usual residents (population stability) does not seem to have an important impact on voter turnout. Finally, the closeness of the electoral race and the presence of a incumbent candidate from the CPC do not wield an influence on the turnout of Canadian citizens.

Conclusion

This paper contributes to the body of literature exploring the determinants of political participation and provides a novel glimpse into the subregional Canadian political landscape. Using recently-published data from the Canadian government, its results provide robust evidence for the existence of a negative relationship between inequality and voter turnout at the Federal Electoral District level in Canada. The findings are in line with relative power theory and revealed that federal districts with higher levels of inequality have lower turnout rates. The models employed in the analysis also showed that voter turnout is positively influenced by the proportion of the total income of a district coming from pension funds, and to a lesser extent from investment revenues. An interesting finding is that the proportion of earnings earned by women also matter and is associated with a substantial positive effect on turnout rates, which reflects evidence that women active in the labour market tend to vote more than men in recent Canadian elections.

While this paper has provided important insights about the political implications of inequality on voter turnout, it merely constitutes an entry point in the deepening of the understanding of the political dynamics within subregional federal electoral districts in Canada. Additional types of data would provide researchers with different ways to build on this research and provide a clearer picture of the political implications of inequality in the country. For example, post-tax income data by district would be useful to compare the different fiscal policy outcomes of provincial programmes. Household or individual-level data would enable to scrutinise the impact of inequality on the turnout of different income groups, an important component in linking inequality with voter mobilisation and representativeness. These data would also permit the calculation of different measures of inequality which could not be obtained using the FEDS data and further reinforce the validity of the findings. Finally, future publication of FEDS data will allow the exploration of the dynamic relation between inequality and voter turnout at the district level over time. This will be particularly helpful to investigate not only the impact of the variations in inequality levels on turnout, but also link it other variations in socio-economic measures of each individual district.

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