# Incumbency Advantage in Canada: Evidence From Redistricting

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**Abstract**

This paper explores the incumbency advantage in Canada using two distinct methods: the traditional regression discontinuity design (RDD) and an approach novel to Canada which leverages redistricting. The RDD reveals a rising incumbency advantage, breaking trend from the US. I estimate a personal advantage ranging from 17.8 to 21.2 percentage points in close elections. In contrast, the redistricting method, which considers both contested and safe seats, shows null results for personal incumbency advantage. This finding suggests that the personal incumbency advantage measured by RDD is driven by the personal effort rather than their status as an incumbent.

*The full data set and replication code package can be freely accessed for review and further research at https://github.com/Seamus-L/RedistrictingIncumbencyBias.

Elections are a widely studied topic by Political Scientists and Economists alike. A central area of interest in this field has been the advantage that incumbents enjoy over their opponents. The incumbency advantage is of particular interest because of its negative effect on competitive elections, a concern that is only increasing with time (Carson et al. (2007)). In fact, in the US, the incumbency advantage grew from only 2% in 1940 to 8% by the end of the century, indicating a worrying trend (Ansolabehere and Snyder (2002)). In Canada, a similar trend exists, with the incumbency advantage growing from 2.4% before the 1950s, to 4.2% in the post-1950 period (Kendall and Rekkas (2012)). In the US, the trend was seen to reverse in recent years, however, it is unknown how Canada has fared in this regard (Jacobson (2015)).

This paper examines the current state of the incumbency advantage in Canada, using novel data, and an alternative method not before used in Canadian elections. By taking advantage of the natural experiment created by a redistricting process, I produce a measure of incumbency advantage that is generalizeable to both hotly contested, and safe seats. I evaluate this by considering the redistricting between the 41st and 42nd general election (2011 and 2015) with a sample of 9,083 polling stations across 216 districts (ridings). I also compare the results from this method with those from the widely accept regression discontinuity design (RDD) run on the same sample, considering the 42nd through 44th election (2015 - 2021). This considers 5,119 individual candidates across races for 1,322 seats.

Why consider a new method for measuring incumbency advantage? Current popular methods focus on close elections, and are not generalizeable to safer seats. Over the years a number of different methods have been proposed, and eventually improved upon. Early methods of measuring the incumbency advantage, such as the "sophomore surge" and "retirement slump", were eventually shown to be biased, so the literature searched for new estimators and methods (Gelman and King (1990)). Since then, the most popular method of measuring incumbency bias has been an RDD using close elections (Lee (2008)). This methodology was later adapted to work at the personal level, rather than party, both of which find wide use in literature to this day (Erikson and Titiunik (2015); Kendall and Rekkas (2012)).These methods work by selecting

elections that were so close they were essentially determined by chance, and then observing the downstream effects on the district or individual in the subsequent election. However, the downside of this method is that it focuses solely only on close elections, and cannot consider ridings that have larger margins.

The alternative methodology that I employ in this paper uses redistricting as a source of exogenous variation, which allows for the measurement of incumbency advantage at the sub-riding level (Ansolabehere et al. (2000)). This is achieved by comparing voters that remain in their riding to those that have just been added via redistricting.

This has the benefit of allowing one to assess the incumbency advantage enjoyed by candidates in safer seats, as well as those that are hotly contested. Though this method is a promising alternative to RDD, it has seldom been used, outside of a handful of examples (Desposato and Petrocik (2003)). This is likely driven by the limited data available, as redistricting processes happen very infrequently (10 years on average). Adapting this to Canada is a novel application of the method, which also provides a much more convincingly exogenous redistricting process than previous studies (Courtney (2004)). Additionally, Canada's parliamentary system is distinctly different from the US's presidential system, making the application here interesting in its own right.

I report two main findings. First, I find that the incumbency advantage in Canada, as measured by RDD, is continuing to rise. I measure a personal incumbency advantage of between 21.2 and 20.4 percentage points when considering the full sample of elections, significant at the 1% level. This effect is similar when restricting the analysis to the 42nd general election, which yields an advantage of 18.6 to 17.8 percentage points, again significant at the 1% level. In contrast with other literature, I find a negative party incumbency advantage, ranging from -9.2 to -6.6 percentage points, with significance ranging between the 10 and 1% level. However, the overall incumbency advantage, as measured by the sum of the two effects, is found to be significantly positive in all samples.

Second, I find that the personal incumbency advantage is entirely null when measured using the redistricting method. While a significant positive effect of 4.1 percentage points is found in basic regression, the addition of fixed effects, and previous voting behaviour as controls result in universally null effects.

My paper provides two contribution to the literature. First, I find that the personal incumbency advantage in Canada is continuing to rise in close elections. This contributes to the general literature on incumbency advantage by providing another updated point for reference. It also shows a divergence in trends between Canada and the US, with the US now trending back down toward zero (Kendall and Rekkas (2012); Jacobson (2015)). I additionally find evidence of strategic exit in recent years in Canadian politics, as measured by a negative party incumbency advantage.

Second, I contribute to the literature by addressing the external validity of the RDD approach. My findings indicate that there is no personal incumbency advantage when measured through redistricting. This suggests that the personal incumbency advantage observed in close elections is driven by the candidate's hard work rather than any inherent advantage of the position itself. This findings suggests that previous concerns about the level of the personal incumbency advantage may be unfounded (Carson et al. (2007)). While my results contrast with previous literature that finds similar outcomes using both methods, they are supported by a more plausibly exogenous redistricting process (Ansolabehere and Snyder (2002); Desposato and Petrocik (2003)).

# 1 Background on Federal Elections in Canada

## 1.1 Electoral system

*Parliamentary Structure.*— Canada uses a Westminster parliamentary system, where citizens within each district (riding) vote for their representative, or member of parliament (MP)

directly. MPs are elected using a first-past-the-post (FPTP) system, meaning the candidate that receives the plurality of votes is elected, regardless of whether or not it was a majority. Currently there are 338 ridings, and therefore, 338 MPs in the legislature. The prime minister is not elected to the position, and is instead the leader of the party that makes government. There is no term limit on MP's, nor on how many times one may occupy the position of prime minister. Elections are held every 4 years, at the most, and are managed nation-wide by Elections Canada, a non-partisan government agency. Elections may occur more frequently if government dissolves, and by-elections may occur if an MP leaves office. Additionally, few federal referenda have ever been held in the Canada, with the most recent being in 1992, Elections Canada (1994).

*Party Composition.*— Unlike many other FPTP systems, Canada has several parties, rather than just two. The five main parties (those that hold seats in parliament) are the Liberal Party of Canada (Liberal), Conservative Party of Canada (Conservative), New Democratic Party (NDP), The Green Part of Canada (Green), and the Bloc Québécois (Bloc), (Library of Parliament (2024)). The Liberal and Conservative party dominate much of the political sphere, with each party being slightly left, and right of center, respectively. These two parties hold the lions share of seats, with 155 and 119 of the total 338 seats, respectively. The remaining main parties are all left-of center, with the Bloc uniquely representing the interest of Quebec exclusively.

## 1.2 Redistricting

*Determining the Number of Seats.*— Elections Canada undertakes a redistricting process every 10 years, as established by the Constitution Act (Elections Canada (2023b)). First, the number of seats initially allocated to each province is determined by the ratio of its population and the electoral quotient. The electoral quotient is calculated as the ratio of population to number of current seats, adjusted by average population growth over the same 10 year period.

After the initial allocation is determined, it is augmented by two special clauses that prevent a province from losing seats. First, the Senatorial Clause guarantees that no province has fewer seats in parliament than it does in the senate. Second, the Grandfather Clause guarantees that no province has fewer seats after redistricting than it had before. A province that is over represented retains its extra seats, while a province that is under represented gains new seats through additional seats being added to parliament. For example, in the 2013 redistricting process, the total number of seats increased from 308 to 338.

*Drawing Electoral Boundaries.*— Following the determination and allocation of seats, three-member commissions are established in each province. The chair of each commission is appointed by the province's chief justice, while the members are appointed by the speaker of the house of commons (parliament) (Elections Canada (2023c)). Each commission then produces a boundary proposal, and circulates it to the public. After a round of public hearings, each commission then finalizes their report, and submits it to the parliament. Once tabled, MPs may object to the report, with at least 10 MPs signing an objection for it to be heard. Once each commissioner considers the objections, and responds to them, the final report for each province is submitted. Many objections are rejected, but minor modifications are often made[1]. This redistricting process, in particular the independence of each commission, make redistricting in Canada much more plausibly exogenous than the US, (Courtney (2004)). The last redistricting effort concluded in 2013, taking effect before the 42nd general election in 2015. Additionally, there is currently a redistricting effort underway that will be concluded ahead of the 45th general election in 2025.

[1]Full details on the objections and responses of each province's commission can be accessed at publications.gc.ca, by searching for, "*Report of the Federal Electoral Boundaries Commission for the province of* _____, *2012*", for the respective province.

# 2 Data

*Summary of Data Sources.*— All data used in this research was acquired directly from Elections Canada, and Statistics Canada. A substantial amount of data cleaning and pre-processing was required to take advantage of the redistricting natural experiment, while the RDD uses raw data with minimal processing. Three follow three data sources were used:

1. Election Results: provided online by Elections Canada at both the riding level, and the polling station level, from the 36th to 44th general election (1997 - 2021) (Elections Canada (2024)). This data set provides all election results, including number of eligible voters and total votes cast for each eligible candidate at a polling station. The data includes ordinary (day-of), advanced, and mobile polls, but only distinguishes between mobile polls and the rest. I restrict all election results to include only the main parties, as described in Section 1.

2. Electoral Boundaries: provided online by Statistics Canada (Statistics Canada (2024)). The files cover a number of election, but only two redistricting periods, the 2003 and 2013 redistricting efforts[2]. These are provided as shape files, with meta data corresponding to riding numbers.

3. Polling Station Location: provided at request by Elections Canada. I requested data for both the 2003 and 2013 redistricting effotrs, however, I only received data corresponding to the latter. This provided the street address for every polling station, and its poll type (ordinary, advanced or mobile). It did not include latitude/longitude coordinates of any polling station.

*Linking Ridings.*— After a redistricting process, riding numbers may change, even if their boundaries have not been adjusted. To compare elections between redistricting periods, ridings

[2]The 2003 boundaries applied to the 38th, 39th, 40th and 41st election, while the 2013 boundaries apply to the 42nd, 43rd and 44th election.

needed to be linked. This was accomplished by matching names of the riding directly. However, in some cases, ridings had their names changed without a substantial change in their boundary. To match these, I consulted Elections Canada documents to see if it was renamed, or a newly created riding (Elections Canada (2023a)). The process matched 216 of a possible 308 ridings, covering 70% of the total sample[3]. By combining this data with the riding shape files, I created new geometry that captured the areas that were newly incorporated into a riding. This was later used to identify polling places as newly added to a riding, or not.

*Polling Place Aggregation.*— While data was provided at the polling station level, it was not associated with polling places directly. A polling place is the building that hosts any number of polling stations, which can range from one to a dozen or more. Because variation arises spatially, the results needed to be aggregated to the polling place level. To achieve this, I created a new index of polling places, that took each unique polling station address from the location data set. Then, the results for each candidate were aggregated to these polling places. This was further filtered to include only ordinary polls to allow for accurate geolocation. This resulted in a six-fold aggregation of observations. For example, when considering the 42nd general election, this process aggregated 77,816 polling stations down to 11,728 polling places.

Because polling station ID numbers change across elections, the only way to associate past results to a polling place is through matching location addresses, just as polling places were aggregated. When restricting the sample to those that match to the previous election, around 50% of the sample is lost. As polling places do not have fixed locations, some level of attrition is to be expected from this matching method. Additional attrition may be driven by inconsistency in coding of addresses across elections. I believe that this attrition is largely random in nature, and will therefore not introduce bias into any estimations.

[3]While there are 338 ridings in the 2013 boundaries, only 308 existed under the 2003 boundaries. Therefore, the maximum number of linked ridings is 308

*Polling Place Geolocation.*— Once the polling places were identified, they needed to be geolocated to latitude and longitude. Geolocation was accomplished using OpenStreetMap's API, which located 9083 of the total 11,728 eligible polling places, or 77% of the sample. Many places could not be located as they did not included a complete address. For example, some locations referred to a community hall, with no street address, only a municipality. Once located, polling places were compared to the riding geometry to identify whether they are from a region that was newly incorporated into a riding or not. Additionally, within the sample that was located, I distinguish between those located approximately, and precisely. Those located approximately were associated with a stretch of road, for example, while precise locations were linked to a specific address. Polling place summary statistics are reported in Table A1.

*Evaluating Bias From Geolocation Attrition.*— Because a large number of polling places could not be geolocated, they were not included in the sample. It is possible that this attrition is non-random, as rural polling places may be less likely to be located due to having less specific addresses or lower quality coverage from the OpenStreetMap API. This form of non-random attrition could lead to bias in the measures of vote share captured in the data, leading to bias in any later estimations. To assess the presence of bias introduced by attrition, I compared the vote share received by the winning party measured in the located sample to the actual value reported by Elections Canada. The results show very limited bias, with the majority of ridings following the 45 degree line. This is shown graphically in Figure 1, and alleviates concern over the introduction of bias. The same evaluation is completed for precisely filtered polling places in Figure A1, providing an identical result.

*Regression Discontinuity Data.*— The data set for the regression discontinuity design uses the results from the 41st through 44th general elections, from 2011 to 2021. It does not consider any by-elections. Unlike the redistricting method, there is little to no attrition, as this method uses the complete set of riding-level results provided by Elections Canada. Over this period

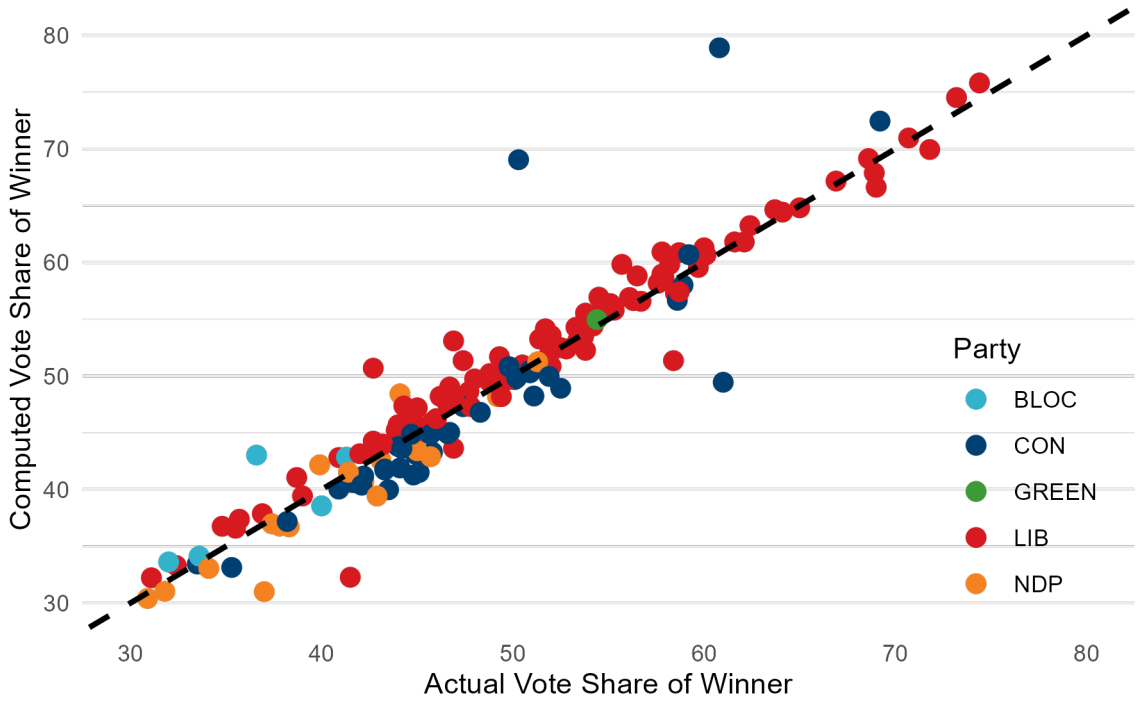


Figure 1: *Winning Vote Share Sample Bias*

*Notes:* This figure compares actual vote share with computed vote share from my sample, with the plotted 45 degree line indicating a perfect match. Results are presented at the riding level, with point colours indicating the winning party. When regressing computed vote share of winner against actual vote share, the slope found is 1.045, with a standard error of 0.0259. The slope is therefore statistically indistinct from 1 at the 5% level. This result dispels concerns over the introduction of bias due to non-random attrition from geolocation.

the number of seats rose from 308 to 338. This entire data set captures 5,119 candidates across 1,322 seats. Over this time period the main parties did not change. Additionally, every seat was contested by multiple parties, avoiding issues related to no-contest.

*Completed Data Set.*— I have compiled the complete data set used in this research, including code, freely available online. This data set includes the geolocation of all polling stations used, as well as shape files for use in GIS software, and data dictionaries for linking ridings across the 41st and 42nd election. It can be accessed online at https://github.com/Seamus-L/RedistrictingIncumbencyBias.

# 3 Measuring Incumbency Advantage: RD Design

## 3.1 Source of Identification

*Random at the Margin.*— Regression discontinuity designs has been widely used in political economy literature for some time. The method relies on a continuity of variables around the treatment. In this case, the variable in question is candidate quality, and the treatment is whether a candidate is the incumbent. If we considered all candidates, we would be comparing candidates of differing levels of quality, as some would received a vast majority of the vote, while others receive single digit percentage points.

By restricting the analysis to candidates that narrowly won, or lost an election, we compare candidates that are similar on average, the only difference being some won the election, and some lost. Under the assumption that the number of votes a candidate receives is random, it stands to reason that those close to the boundary were randomly assigned to win. This essentially provides a randomised experiment, allowing for an unbiased estimation of the incumbency advantage. This provides a local effect for close elections, which cannot be generalized to safe ridings, where a candidate wins with a great degree of certainty.

## 3.2 Specification

*Forcing Variable.*— In a standard incumbent advantage RDD, previous-election vote share is used as the forcing variable, with the discontinuity appearing at 50%. While the principles of regression discontinuity design similarly apply in Canadian elections, the multi-party nature means that 50% of vote share does not provide a clean cutoff for incumbency. Instead, I use margin of victory.

For the winning party, margin of victory in the previous election is measured as the difference between the vote share they received, and the vote share of the 2nd place candidate. For all other parties, the margin of victory is measured as the difference between the vote share they

received and the winner. Therefore, the incumbent will have a positive margin of victory, while the other parties will have a negative value. This creates a natural break point around 0, where the margin of victory was so low that the outcome was essentially random.

*Empirical Specification.*— To assess the incumbency advantage using an RDD, I use the following specification:

$$V_{ikt} = \alpha_i i + \beta_1 Incumbent_{ikt} + \beta_2 MV_{ik,t-1} + \beta_3 Incumbent_{ikt} MV_{ik,t-1} + \varepsilon_{ikt} \tag{1}$$

Where there are $i \in I$ parties, with $k \in K$ ridings in election at time $t$. $V_{ikt}$ is the outcome of interest, the vote share of party $i$ in riding $k$ in time $t$. $Incumbent_{ikt}$ is a dummy that takes 1 if the margin of victory was positive, and 0 otherwise. $\alpha_i$ captures party fixed effects. The coefficient of interest is $\beta_1$, which captures the discontinuity, and can therefore be interpreted as the incumbency advantage.

*Disentangling Personal Incumbency.*— When using the entire data set, the incumbency advantage measured is a combination of the advantage attributed to both the party, and the individual. The personal incumbency advantage could theoretically be measured directly if we could observe many instances of either candidates running as independents, or changing parties between elections. However, this does not occur often in Canada. An alternative to this is to restrict the data set to instances where the incumbent candidate did not seek re-election to measure the party incumbency advantage directly. Then, by taking the difference between $\beta_1$ from the overall regression and the same coefficient from the party regression, I can find the personal incumbency effect. An elegant way of achieving the same results in one regression was proposed by Kendall and Rekkas (2012), using the following specification:

$$V_{ikt} = \alpha_i i + \beta_1 Incumbent_{ikt} + \beta_2 MV_{ik,t-1} + \beta_3 Incumbent_{ikt} MV_{ik,t-1} + \beta_4 Repeat_{ikt} +$$
$$\beta_5 Incumbent_{ikt} Repeat_{ikt} + \beta_6 Repeat_{ikt} MV_{ik,t-1} + \beta_7 Incumbent_{ikt} Repeat_{ikt} MV_{ik,t-1} + \varepsilon_{ikt} \quad (2)$$

The previous regression is augmented by the term $Repeat_{ikt}$, which is a dummy that takes 1 in the case that the same candidate ran in both the election in time $t$, and $t-1$. Additional interaction terms are included as well. From this regression, we can interpret $\beta_1$ as the party incumbency effect, in isolation. Additionally, $\beta_5$ is the personal incumbency effect, in isolation. The overall effect, then, is their sum.

# 4 Measuring Incumbency Advantage: Redistricting

## 4.1 Source of Identification

*New Voters and Old Voters.*— Unlike the regression discontinuity method, identification comes from the difference in voter behaviour at the polling place level, rather than the riding level. After a redistricting, ridings will have new areas added, as well as existing areas removed. Residents voting at polling places newly incorporated in the riding are seeing the candidates for the first time, while those that were previously in the riding are already familiar with them. Therefore, for those new to the riding, the candidate is not an incumbent, while for others they are. This creates a natural experiment, where the incumbency advantage is then measured by comparing the difference in voting behaviour between existing, and newly added polling places.

Because identification comes from the process of redistricting, only the election that occurred immediately before, and immediately after a redistricting process can be considered. This means in Canada, and many other countries, an opportunity for such a natural experiment only occurs every 10 years. The identification method is shown graphically in Figure 2.

This method assumes that all voters at a polling place will either be new to the riding, or not. This is not entirely likely for polling places in close proximity to the boundary of the new area. Unfortunately, Elections Canada does not have guidelines on how far someone should reasonably be expected to travel to vote, so it is not a simple process to exclude potentially blended polling places. However, this method has the advantage of considering all ranges of elections, including safe seats, instead of just those that are narrowly decided.

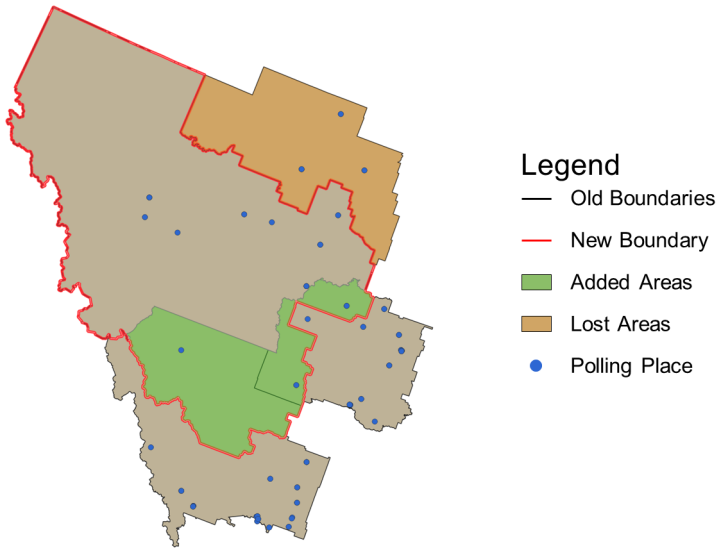


Figure 2: *Identification of Incumbency Advantage From Redistricting*

*Notes:* The new boundary corresponds to the Riding 48034 - Yellowhead (Northern Alberta), as laid out under the redistricting order of 2013. The lost areas are the regions that were lost from the riding, while the added areas are those that are new to the riding under the redistricting order. Identification of the incumbency advantage comes from comparing the vote share of the incumbent party in polling places located within the retained area of the riding to those that were newly added. Polling places shown are ordinary polls that could be geolocated form the 42nd general election.

## 4.2 Specification

*Empirical Specification.*— To assess the incumbency advantage, as described above, I use the following specification, first developed by Ansolabehere et al. (2000):

$$V_{ijkt} = \alpha_{it} i_t + \alpha_{kt} k_t + \beta_1 N_{jt} + \beta_2 V_{ij,t-1} + \beta_3 N_{jt} V_{ij,t-1} + \varepsilon_{ijkt} \tag{3}$$

Where there are $i \in I$ parties, with $j \in J$ polling places in $k \in K$ ridings in election at time $t$. $V_{ijkt}$ is the outcome of interest, the vote share of party $i$ at polling place $j$ in riding $k$ in time $t$. $N_{jt}$ is a dummy that takes 1 if the polling place is new to the riding, and 0 otherwise. $V_{ij,t-1}$ is then the vote share of party $i$ at polling place $j$ in time $t-1$. $\alpha_{it}$ captures party-year fixed effects, while $\alpha_{kt}$ captures riding-year fixed effects. The coefficient of interest is $\beta_1$, which captures the differences in vote share the incumbent party receives in new polling places vs old ones. We can then directly interpret $\beta_1$ as the incumbency advantage.

The term $V_{ij,t-1}$ is important to include, as it controls for the political leaning of the polling place. In other research, a longer range rolling average, or the vote share for another office (presidential vote) has been used. My measure is imperfect, but due to data constraints, this was the best measure available. There is no alternate office, or referendum to consider as a measure for this at a federal level in Canada. Additionally, matching polling places across elections is challenging due to a high level of natural attrition from their relocation, meaning that even if data were available for earlier elections, it may be best to exclude it.

*Personal Incumbency Advantage.*— To use the regression equation described above, the polling-place-level results were filtered to only contain incumbents. That is, I only considered the results for the candidate in the 42nd general election in riding $k$ that won in that riding that same riding in the 41st general election, and ran again. This simplifies the equation so that an incumbent dummy is not required. To isolate the personal incumbency advantage, the data was further filtered so that polling places with $N_{jt} = 1$ were only included if the incumbent from their old riding was of the same party as the incumbent in their new one. Doing this isolates the personal incumbency advantage, as those with $N_{jt} = 1$ will view the same incumbent party, but a different candidate.

# 5 Results

## 5.1 Regression Discontinuity

The results show that incumbency advantage in Canada contributes to a tremendous fraction of the total vote share a candidate receives in close elections, as shown in Table 1. This is the case across both the full sample of date (42rd - 44th general election), as well as when restricted to the 42nd general election. The samples are tested using both a $\pm 10\%$ and $\pm 15\%$ bandwidth around 0 margin of victory to make the results directly comparable to previous research on the topic. The results are generally robust across specifications, but the findings for the $\pm 15\%$ bandwidth are reported in text. The personal incumbency advantage accounts for 21 percentage points of the vote share a candidate receives in the full sample, and 18 percentage points of their vote share in the 42nd general election, both significant at the 5% level.

The party incumbency advantage is significantly negative in the full sample, but insignificant in the 42nd general election. This leads to an overall incumbency effect (the difference between the two) that is significantly positive at the 5% level in both samples. This is shown for the 15% bandwidth in Figure 3, and in Figure A2 for the 10% bandwidth. This negative coefficient could be driven by strategic exit. If a candidate does poorly during their term, they will be less likely to seek reelection, leading to lower levels of support for their replacement in the next year. Due to the small time frame considered in my data, a transient systemic shock could potentially be responsible for this, such as some form of controversy.

These results are a dramatic increase over previous estimates of the personal incumbency advantage in Canada. Kendall and Rekkas (2012), find a personal incumbency advantage was 4.2 between 1867 and 2008. My result is a five-fold increase, which shows that the personal incumbency advantage has only continued to increase in recent years. Though the magnitudes are much larger that previous findings, my results do agree with the previous research that the majority of the overall effect is attributed to the personal incumbency advantage.

The other coefficients reported correspond to the slope. As expected, we find that the vote share a candidate receives positively correlates with their vote share in the next election, however, for candidates that run twice in succession, the net effect of their previous performance is statistically insignificant. This is calculated as the difference between $MV_{t-1}$ and $MV_{t-1} : Repeat$. This suggests that for repeat candidates, the only thing that matters is whether or not they were an incumbent, not how close their previous election was.

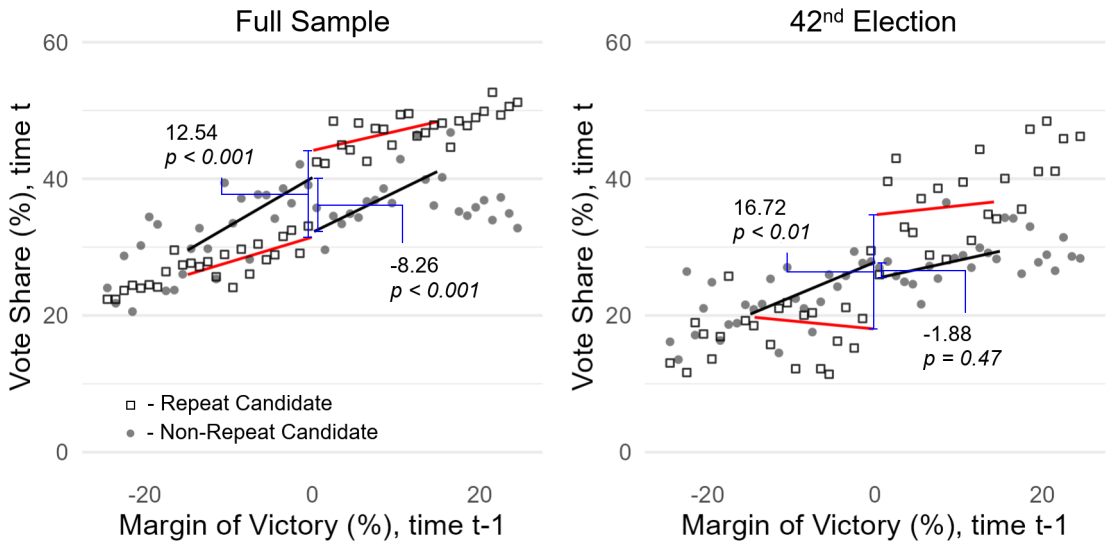


Figure 3: *Vote Share vs Margin of Victory Regression Discontinuity: 15% Bandwidth*

*Notes:* Points are binned at 1% of Margin of Victory, with party fixed effects included. The bandwidth was constrained to a $\pm 15$ percentage point interval around a margin of victory of 0. The red line corresponds to the linear best fit for repeat candidates, while the black corresponds to the linear best fit for non-repeat candidates. The gap between red lines measures the overall incumbency advantage, while the gap between black lines measures the party incumbency advantage in isolation.

## 5.2 Redistricting

The results show that the personal incumbency advantage in Canada is entirely insignificant when considering the full range of elections, both safe and close, as shown in Table 2. This finding is robust to numerous specifications, considering different combinations of fixed effects, and previous vote share. The coefficient on *IsNew* is the negative of the personal incumbency

Table 1: Incumbency Advantage: Regression Discontinuity

| | Vote Share (Percentage Points) | | | |
|---|---|---|---|---|
| | Full Sample | | 42nd General Election | |
| | 15% Bandwidth | 10% Bandwidth | 15% Bandwidth | 10% Bandwidth |
| | (1) | (2) | (3) | (4) |
| *Incumbent* | -8.262*** | -9.435*** | -1.877 | -2.834 |
| | (1.747) | (2.105) | (2.581) | (2.893) |
| *Repeat* | -9.225*** | -7.486*** | -9.708*** | -6.595* |
| | (1.669) | (2.147) | (3.281) | (3.720) |
| *Incumbent*:*Repeat* | 21.162*** | 20.412*** | 18.594*** | 17.763*** |
| | (2.451) | (3.096) | (4.956) | (5.543) |
| $MV_{t-1}$ | 0.748*** | 0.790*** | 0.503** | 0.757** |
| | (0.147) | (0.274) | (0.211) | (0.357) |
| $MV_{t-1}$:*Repeat* | -0.410** | -0.068 | -0.621 | -0.010 |
| | (0.195) | (0.382) | (0.378) | (0.649) |
| Observations | 909 | 626 | 199 | 134 |
| Adjusted $R^2$ | 0.454 | 0.417 | 0.785 | 0.823 |

*Notes:* *p<0.1; **p<0.05; ***p<0.01. Standard errors are clustered at the riding level. Party fixed effects are included. The first two columns captures the results for the full sample, the 42nd-44th general election (2015-2021), while the second pair is restricted to the 42nd general election. The coefficient on *Incumbent* is the party-incumbency effect, while the coefficient on *Incumbent:Repeat* captures the personal incumbency advantage.

advantage. A negative value indicates that the new voters vote less for the incumbent than old ones, meaning that the incumbency advantage is positive. Across the specifications used, the personal incumbency advantage is positive when fixed effects are omitted, but upon their inclusion, the effect becomes insignificant.[4]

Including $V_{ij,t-1}$ is important to the regression as it captures the previous voting preferences of those that poll $j$. To include this term, polling places must be linked to the previous election, which could only be accomplished approximately 50% of the time, leading to large sample attrition, as shown in decline in sample size. There are some concerns that this attrition may be driving the insignificance of the result, as the standard error of *IsNew* varies greatly between regressions 1 and 4, as well as 3 and 5.

Table 2: Personal Incumbency Advantage: Redistricting

| | Vote Share (Percentage Points) | | | | |
|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) |
| *IsNew* | -0.041*** | -0.005 | 0.007 | -0.231*** | -0.006 |
| | (0.011) | (0.008) | (0.009) | (0.055) | (0.031) |
| $IncumbentVoteShare_{t-1}$ | | | | 0.470*** | 0.712*** |
| | | | | (0.022) | (0.013) |
| $IsNew : IncumbentVoteShare_{t-1}$ | | | | 0.314*** | -0.012 |
| | | | | (0.107) | (0.063) |
| *PartyFE* | | ✓ | ✓ | | ✓ |
| *RidingFE* | | | ✓ | | ✓ |
| Observations | 5,811 | 5,811 | 5,811 | 2,869 | 2,869 |
| Adjusted $R^2$ | 0.002 | 0.397 | 0.688 | 0.152 | 0.852 |

*Notes:* *p<0.1; **p<0.05; ***p<0.01. Standard errors are clustered at polling-place level. The coefficient on *IsNew* is the negative of the personal incumbency advantage. Each column presents a different specification, using a different combination of fixed effects and control variables. Columns 1, 2, and 3 examine the impact of different fixed effects, while 4 and 5 examine the effect of historical vote share. When introducing $IncumbentVoteShare_{t-1}$ to the regression, the sample size drops due to the difficulty linking polling places across elections, as described in Section 2.

[4]These findings consider all geolocated polling stations. Table A2 shows the results for this same regression repeated with only precisely located polling places. Additionally the same regressions are repeated using party incumbents, not personal incumbents, in Table A3 and A4. This measures the party + personal incumbency advantage, which is what is often reported in other RD design papers.

## 5.3 Comparison of Findings

*Incumbency Advantage in Canada.*— I find that there is a large difference between the personal incumbency advantage measured across both methods. First, while RDD is internally valid, it is not generalizeable to all elections. This fact is readily acknowledged by the literature, with the caveat that close elections are what are more important. However, this finding is often touted as a metric of how non-competitive elections are; the higher the incumbent advantage, the safer an incumbent is.

This interpretation is problematic, as it possible that the personal incumbency advantage measured through a RDD is driven by the unobserved effort of the incumbent. The reasoning being that if an incumbent narrowly wins their seat, they will be more inclined to work hard to maintain their seat, and therefore do better in the next election. The findings from the redistricting natural experiment indicate that the incumbency advantage is insignificant across all elections, supporting this alternative hypothesis, that incumbents gain vote share due to their work rather than their position. This finding dampens concern for political competition over the increasingly large incumbency advantage measured through the regression discontinuity model.

*Previous Redistricting Papers.*— The few papers that consider this methodology in the United States find results very similar to those from an equivalent RDD. The stark contrast between my findings and previous literature suggests that there must be some underlying differences driving this result, with two main candidates. First, voter attitudes between the two countries may be sufficiently different, whether through partisanship, level of political awareness, or some other channel. Alternatively, gerrymandering may introduce bias. By controlling the distribution of new voters to a district, successful gerrymandering would register a positive incumbency advantage when considering safe ridings.

# 6 Concluding Remarks

This paper examines the current state of incumbency advantage in Canada by comparing and contrasting two distinct measurement methods. The first method is the traditional regression discontinuity design, which focuses on close elections. The second method, which is novel to Canada, leverages the natural experiment created by redistricting, encompassing both close and safe elections. I find evidence of an increasing incumbency advantage in close Canadian elections. However, I also find that across all elections, both safe and close, the incumbency advantage is null.

This paper provides two contribution to the literature. First, I find that the personal incumbency advantage in Canada is continuing to rise in close elections. This marks a divergence from the trend that Canada and the US once shared, with the US now trending back down toward zero. I additionally find evidence of strategic exit in recent years in Canadian politics. Second, I contribute to the literature by confronting the external validity of the regression discontinuity design, finding a null incumbency advantage when measured through redistricting. This suggests that the personal incumbency advantage observed in close elections is driven by the candidate's hard work rather than any inherent advantage of the position itself. This indicates that we need not be overly concerned about the rising incumbency advantage as others have claimed.

There are limitations in the available data, as only a single election could be analyzed using the redistricting method. Expanding the sample to include a broader historical range would enhance our understanding of the relationship between this method and the regression discontinuity design. Additionally, high attrition when linking to previous elections may have driven part of the results. Finally, the extent of mixing between new and old voters at polling places near boundaries could not be assessed.

Although my findings do not offer clear policy recommendations, they underscore the need for further research. Addressing the limitations outlined would improve confidence in the true value of the incumbency advantage. Furthermore, evaluating the impact of gerrymandering on personal incumbency advantage in the US with this method could provide insights that support policy recommendations for non-partisan redistricting.

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# Appendix

Table A1: Polling Place Count and Summary Statistics

| Sample | Mean | St. Dev. | Min | Max |
|---|---|---|---|---|
| Full Sample | 38.004 | 16.814 | 1 | 98 |
| All Located | 24.314 | 21.850 | 0 | 91 |
| New Located | 1.000 | 4.162 | 0 | 52 |
| All with Precise Filter | 19.866 | 19.834 | 0 | 88 |
| New with Precise Filter | 0.803 | 3.805 | 0 | 48 |

*Notes:* All statistics are reported at the riding level. Located polling places are those that could be geolocated. Precise filter refers to polling places that were located to an address, as described in section 3. New polling stations are those that are newly incorporated into a riding by redistricting.

Table A2: Personal Incumbency Advantage: Redistricting - Precise

| | Incumbent Vote Share | | | | |
|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) |
| *IsNew* | -0.053*** | -0.013 | 0.006 | -0.170*** | 0.007 |
| | (0.012) | (0.009) | (0.010) | (0.065) | (0.035) |
| $IncumbentVoteShare_{t-1}$ | | | | 0.434*** | 0.689*** |
| | | | | (0.026) | (0.015) |
| $IsNew : IncumbentVoteShare_{t-1}$ | | | | 0.168 | -0.064 |
| | | | | (0.133) | (0.074) |
| *PartyFE* | | ✓ | ✓ | | ✓ |
| *RidingFE* | | | ✓ | | ✓ |
| Observations | 4,748 | 4,748 | 4,748 | 2,319 | 2,319 |
| Adjusted $R^2$ | 0.004 | 0.442 | 0.714 | 0.125 | 0.854 |

*Notes:* *p<0.1; **p<0.05; ***p<0.01. Standard errors are clustered at polling-place level. This regression is restricted to only consider polling places that have been precisely located, as described in Section 3. The coefficient on *IsNew* is the negative of the personal incumbency advantage. Each column presents a different specification, using a different combination of fixed effects and control variables. Columns 1, 2, and 3 examine the impact of different fixed effects, while 4 and 5 examine the effect of historical vote share. When introducing $IncumbentVoteShare_{t-1}$ to the regression, the sample size drops due to the difficulty linking polling places across elections, as described in Section 3.

Table A3: Party + Personal Incumbency Advantage: Redistricting

| | Incumbent Vote Share | | | | |
|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) |
| *IsNew* | -0.033*** | -0.001 | 0.013* | -0.192*** | -0.029 |
| | (0.011) | (0.008) | (0.007) | (0.055) | (0.025) |
| $IncumbentVoteShare_{t-1}$ | | | | 0.522*** | 0.712*** |
| | | | | (0.017) | (0.010) |
| $IsNew : IncumbentVoteShare_{t-1}$ | | | | 0.262** | 0.043 |
| | | | | (0.106) | (0.049) |
| *PartyFE* | | ✓ | ✓ | | ✓ |
| *RidingFE* | | | ✓ | | ✓ |
| Observations | 8,983 | 8,983 | 8,983 | 4,390 | 4,390 |
| Adjusted $R^2$ | 0.001 | 0.377 | 0.699 | 0.185 | 0.857 |

*Notes:* *p<0.1; **p<0.05; ***p<0.01. Standard errors are clustered at polling-place level. The coefficient on *IsNew* is the negative of the party + personal incumbency advantage. Each column presents a different specification, using a different combination of fixed effects and control variables. Columns 1, 2, and 3 examine the impact of different fixed effects, while 4 and 5 examine the effect of historical vote share. When introducing $IncumbentVoteShare_{t-1}$ to the regression, the sample size drops due to the difficulty linking polling places across elections, as described in Section 3.

Table A4: Party + Personal Incumbency Advantage: Redistricting - Precise

| | Incumbent Vote Share | | | | |
|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) |
| *IsNew* | -0.038*** | -0.004 | 0.008 | -0.146** | 0.002 |
| | (0.012) | (0.009) | (0.008) | (0.064) | (0.029) |
| $IncumbentVoteShare_{t-1}$ | | | | 0.443*** | 0.665*** |
| | | | | (0.021) | (0.012) |
| $IsNew : IncumbentVoteShare_{t-1}$ | | | | 0.159 | -0.045 |
| | | | | (0.130) | (0.063) |
| *PartyFE* | | ✓ | ✓ | | ✓ |
| *RidingFE* | | | ✓ | | ✓ |
| Observations | 7,098 | 7,098 | 7,098 | 3,402 | 3,402 |
| Adjusted $R^2$ | 0.001 | 0.416 | 0.728 | 0.128 | 0.855 |

*Notes:* *p<0.1; **p<0.05; ***p<0.01. tandard errors are clustered at polling-place level. This regression is restricted to only consider polling places that have been precisely located, as described in Section 3. The coefficient on *IsNew* is the negative of the party + personal incumbency advantage. Each column presents a different specification, using a different combination of fixed effects and control variables. Columns 1, 2, and 3 examine the impact of different fixed effects, while 4 and 5 examine the effect of historical vote share. When introducing $IncumbentVoteShare_{t-1}$ to the regression, the sample size drops due to the difficulty linking polling places across elections, as described in Section 3.

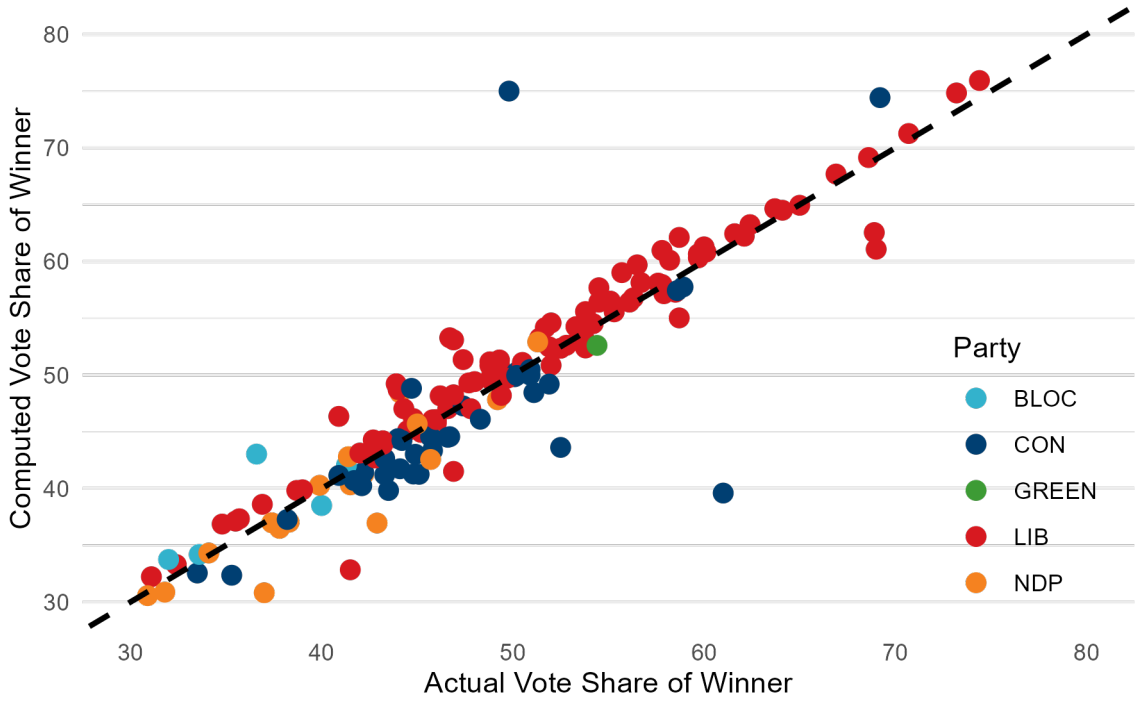


Figure A1: *Winning Vote Share Sample Bias - Precise Locations*

*Notes:* This figure compares actual vote share with computed vote share in the precisely located sample, with the plotted 45 degree line indicating a perfect match. When regressing computed vote share of winner against actual vote share, the slope found is 1.046, with a standard error of 0.0327. The slope is therefore statistically indistinct from 1 at the 5% level. This result dispels concerns over the introduction of bias due to non-random attrition from geolocation, even within the preicse sample.

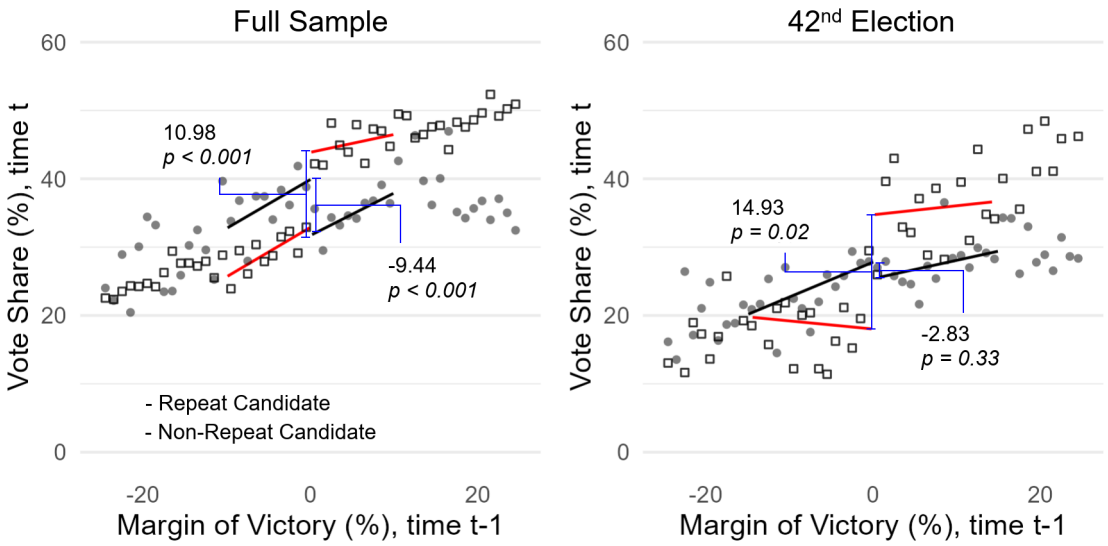


Figure A2: *Vote Share vs Margin of Victory Regression Discontinuity: 10% Bandwidth*

Notes: Points are binned at 1% of Margin of Victory, with party fixed effects included. The bandwidth was constrained to a $\pm 10$ percentage point interval around a margin of victory of 0. The red line corresponds to the linear best fit for repeat candidates, while the black corresponds to the linear best fit for non-repeat candidates. The gap between red lines measures the overall incumbency advantage, while the gap between black lines measures the party incumbency advantage in isolation.