

Ontario General Election Analysis


Motivation


We wanted to analyze the results of the 2018 Ontario general election. In particular we were interested in the role that financial donations play in predicting success in elections on a per-district level. By examining data sources that were available from Elections Ontario, it seemed that it would be possible to determine relationships between the success of candidates and parties running for election, and the financial donations that they recieved in the lead-up to the election.


Gathering Data

The data that we were interested in analyzing were data related to the results of the 2018 Ontario general election. We were especially interested in finding data related to the financial contributions towards the political parties involved in the election and to the candidates running in different electoral districts. We were also interested in other data related to the electoral districts. The data for the financial contributions from the years 2014-2018 were used, because those were the years leading up to the 2018 election, and seemed the most applicable donations towards that particular election. The financial contribution data was downloaded from the Elections Ontario website in the form of a .csv file¹. The results of the general elections in 2011, 2014 and 2018, were similarly retrieved from the Elections Ontario website². Data for the population and area were scraped from the Elections Ontario website³ since it was not available for download and the information on the page for each district needed to be combined. The results for the 2022 election were not available, and were instead retrieved from Wikipedia⁴.

1. Elections Ontario. (n.d.). Retrieved August 14, 2022, from <https://results.elections.on.ca/en/data-explorer?fromYear=1867&toYear=2022&electionId=504&levelOfDetail=candidate> 

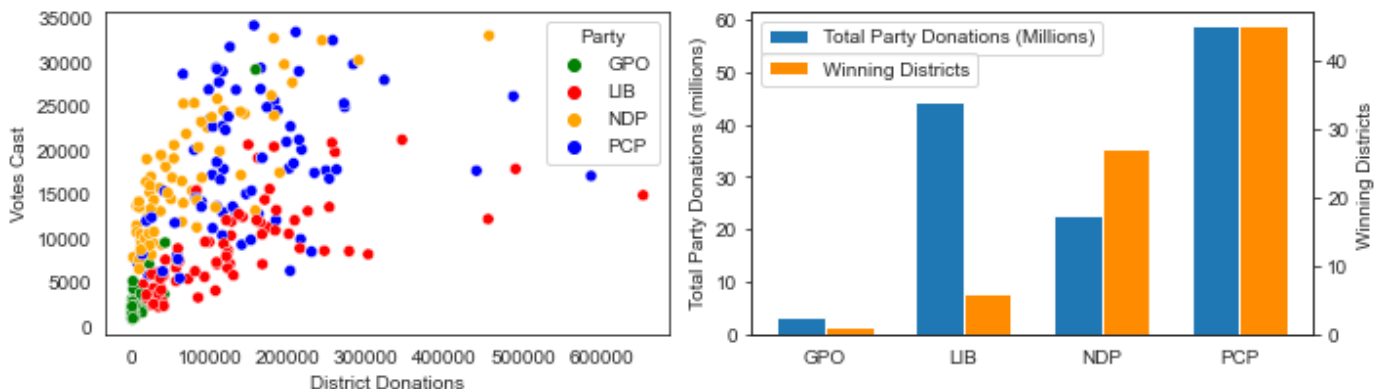
2. Elections Ontario. (n.d.). Retrieved August 14, 2022, from <https://finances.elections.on.ca/en/contributions?fromYear=2014&toYear=2022> 

3. Elections Ontario. (n.d.). Retrieved August 14, 2022, from <https://voterinformationservice.elections.on.ca/en/electoral-district/1> 

4. Wikimedia Foundation. (2022, July 27). 2022 Ontario general election. Wikipedia. Retrieved August 14, 2022, from https://en.wikipedia.org/wiki/2022_Ontario_general_election 

Challenges Preparing Data

One significant difficulty that occurred was due to the change of the Ontario electoral districts in 2018. The 107 districts that existed in the 2011 and 2014 elections were increased by 17 to 124, and many of the districts had their boundaries redrawn. This presented a significant hurdle since donations to many districts in the years leading up to the election could not be mapped directly onto the districts that existed during the election. It was decided to only use the districts that did not change, which still represented a significant sample. Another issue is that many of the donation entries were not to a particular candidate in an electoral district, and were instead to the provincial party. Since these donations represented a majority of the money donated during the 2014-2018 period examined, they needed to be accounted for, and that was done by including a variable for each candidate that corresponded to the total financial donations of their party. Lastly, the existence of a large number of political parties that won no ridings, and received very little or no financial donations threatened to make the analysis unnecessarily messy, so the decision was made to only include parties that won at least one riding, so the Liberal, Progressive Conservative, Green, and New Democratic parties were the only ones used. Below we can see the distribution of votes received vs financial donations received, for each candidate. We can also see the votes received and the financial donations received for each party, side-by-side.



Conclusions

There does appear to be a relationship between donations and election outcomes. The parties that received a larger total amount of financial donations tended to win more seats in an election, and also the candidates that receive more donations were more likely to win their riding. A linear regression to predict the number of votes that a candidate will receive, based on the donations they receive, accounts for slightly more than a third of the variation in the number of votes received. Similarly, in an effective machine learning model that predicts winning candidates with approximately 90% accuracy, the most important feature is the donations that the candidate received.