Impact of Federal Party Leadership Changes on Donation Patterns*

An Analysis of Political Donations in Canada 2013 - 2024

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This study investigates how the ruling political parties in Canada's federal and Ontario provincial governments affect the donation behaviors of individual contributors. By analyzing donation records from 2013 to 2024, the research explores whether a party being in power influences the total amount of financial support it receives. The findings reveal that opposition parties often receive more donations than those in power, highlighting donor preferences to support challengers. This insight enhances our understanding of political financing and can help parties and policymakers develop more effective fundraising strategies.

1 Introduction

Political donations play a critical role in supporting political campaigns and shaping electoral competition. In Canada, both federal and provincial elections rely heavily on contributions from individuals and organizations, which influence the political landscape and often reflect public support for different parties. Understanding what drives donation patterns is essential for ensuring transparency and fairness in the democratic process and for minimizing the risk of undue influence on policy-making.

One key question is whether a party's position in power affects the amount of financial support it receives. While studies in other countries, such as the U.S.A, have shown that incumbents often benefit from more donations, particularly from interest groups looking to maintain influence, there has been less focus on whether this holds true in Canada. Research like Fouirnaies and Hall's work (REFERENCE HERE) in the U.S. shows that donors strategically target

*Code and data are available at: https://github.com/MariaMangru/Ontario_Political_Donors.

those in power, but how these dynamics play out in Canadian elections remains under explored. This paper aims to fill that gap by analyzing how a party's power status influences donor behaviour in federal and Ontario provincial elections.

Using donation data from 2013 to 2024, this study compares the financial support received by parties in power versus those in opposition. The analysis examines total donations by year and party while accounting for factors like election timing and party size (major party or not). By identifying trends in how donors respond to shifts in political power, this research sheds light on the financial strategies behind Canada's democratic processes.

The results show that opposition parties tend to receive higher donations than those in power, suggesting that donors often prioritize supporting challengers, possibly to influence political change. These findings align with trends observed in other political systems but highlight unique patterns in Canada. This information is valuable not only for political parties developing fundraising strategies but also for policymakers and researchers seeking to ensure fairness and accountability in political financing.

The paper is organized as follows: Section **??** discusses the data sources and methodology, followed by an explanation of the variables used in the analysis. The regression models and results are then presented, along with interpretations. The paper concludes by discussing the broader implications of the findings and suggesting directions for future research.[NEED TO UPDATE THE REFERENCES]

2 Data

2.1 Overview

The dataset used in this analysis comprises political donation records spanning from 2013 to 2024, covering both the federal level and the province of Ontario in Canada. These records were sourced from the Investigative Journalism Foundation (IJF), which systematically collects and maintains comprehensive data on political donations across various Canadian jurisdictions. The IJF gathers daily updates by monitoring elections agency websites at the federal level and within each province and territory, ensuring the dataset remains current and robust. Although the IJF's repository includes historical data dating back to 1993, this study focuses exclusively on the 2013–2024 period to capture recent trends and changes in political financing dynamics (Investigative Journalism Foundation 2024).

The analysis was conducted using the statistical programming language R (R Core Team 2024) and several packages for data manipulation and visualization, including `dplyr` (Wickham et al. 2023), `ggplot2` (Wickham 2016), `readr` (Wickham et al. 2023), and `tidyr` (Wickham et al. 2023).

Political donations in Canada are subject to legal disclosure requirements, promoting transparency and accountability within the democratic process. Both federal and provincial election finance laws mandate that political parties, candidates, and associated entities report donations exceeding specific thresholds. These disclosures vary by jurisdiction in terms of frequency and reporting formats. For instance, Ontario requires annual returns for general and by-elections, leadership races, and donations to parties, candidates, and constituency associations, all available in downloadable spreadsheet formats from 2007 onward. This regulatory framework ensures that significant contributions are systematically documented and publicly accessible, providing a reliable foundation for this analysis.

2.2 Measurement

The primary objective of this analysis is to investigate the impact of a political party's power status on donation patterns within Canadian federal and Ontario provincial elections. The dataset includes detailed records of donations made to various recipients, such as political parties, party leadership contestants, riding associations (also known as electoral district or constituency associations), and individual riding candidates. Donations are tracked across different types of electoral events, including general elections, by-elections, and leadership races.

Key variables within the dataset are as follows:

- **Political Party:** A categorical variable indicating the recipient political party, encompassing both major parties (e.g., Liberal Party, Conservative Party, New Democratic Party) and minor parties.
- **Donation Year:** A numerical variable representing the year the donation was made, ranging from 2013 to 2024. This captures different political climates and election periods.
- **Amount Donated:** A continuous variable denoting the monetary value of each donation, varying widely due to differing donor capacities and legal contribution limits.

2.2.1 Constructed Variables

Several variables were constructed to facilitate a more nuanced analysis:

- **Recipient_in_Power:** A binary variable indicating whether the recipient party was in power during the donation year (1 for in power, 0 for not in power). This was determined by cross-referencing the donation year with historical records of party leadership at both the federal and provincial levels.
- **Party_Size:** A binary variable categorizing parties as major (1) or minor (0), based on their representation in the legislature. Major parties are those with significant representation or historical influence.

- **Election_Year:** A binary variable indicating whether the donation was made during an election year (1) or not (0), based on official election dates at the federal and provincial levels.

2.3 Data Cleaning

The raw donation records underwent several preprocessing steps to ensure the dataset's integrity and suitability for analysis:

1. **Handling Missing Values:** Records with missing or incomplete information, particularly in key variables such as donation amount or recipient party, were excluded from the analysis to maintain data quality.
2. **Standardizing Party Names:** Political party names were standardized to ensure consistency. For example, variations like "Progressive Conservative Party of Ontario" and "PC Party of Ontario" were consolidated under a single standardized name.
3. **Removing Outliers:** Extreme donation amounts that could skew the analysis were identified and removed based on predefined thresholds, acknowledging the legal donation limits in Canada.
4. **Aggregating Donations:** Donations were aggregated to reflect total amounts per party per year, facilitating a higher-level analysis of donation patterns.
5. **Creating Binary Variables:** Binary indicators were generated for key variables such as `Recipient_in_Power`, `Party_Size`, and `Election_Year` to streamline regression analysis.

Additional details on the data cleaning process, including code snippets and specific handling of anomalies, are provided in Appendix A.

2.4 Outcome Variables

The main outcome variable of interest is the **Amount Donated**, representing the monetary value of each donation made to a political party within a given year. This continuous variable is critical for assessing the financial support received by parties and understanding how it correlates with factors like power status and party size.

The distribution of donation amounts varies between the federal and provincial levels. At the federal level, the average donation amount is higher, reflecting different legal contribution limits and donor behaviors.

2.5 Predictor Variables

Several key predictor variables were identified to evaluate factors influencing donation amounts:

- **Recipient_in_Power:** Indicates whether the recipient party was in power during the donation year (1) or not (0). This variable is central to assessing the impact of political power on donation patterns.
- **Party_Size:** Categorizes parties as major (1) or minor (0). Major parties are expected to receive more donations due to greater visibility and established support bases.
- **Election_Year:** Indicates whether the donation was made during an election year (1) or not (0). Election years often see increased fundraising activities.

2.5.1 Additional Predictor Variables

- **Log_Total_Donations:** The logarithm of total donations received by a party in a given year, calculated as `log(Total_Donations + 1)` to handle zero values and normalize the distribution.
- **Interaction Terms:** Interaction terms such as `Recipient_in_Power * Party_Size` were included in the models to explore how the effect of being in power varies between major and minor parties.

2.6 Summary Statistics

2.6.1 Donations Based on Recipient Power Status

2.6.1.1 Ontario

Table 1 presents the total donations and average donation amounts in Ontario, categorized by whether the recipient party was in power.

Table 1: Donations by Power Status in Ontario

Figure 1 illustrates the total donations and average donation amounts over the years in Ontario.

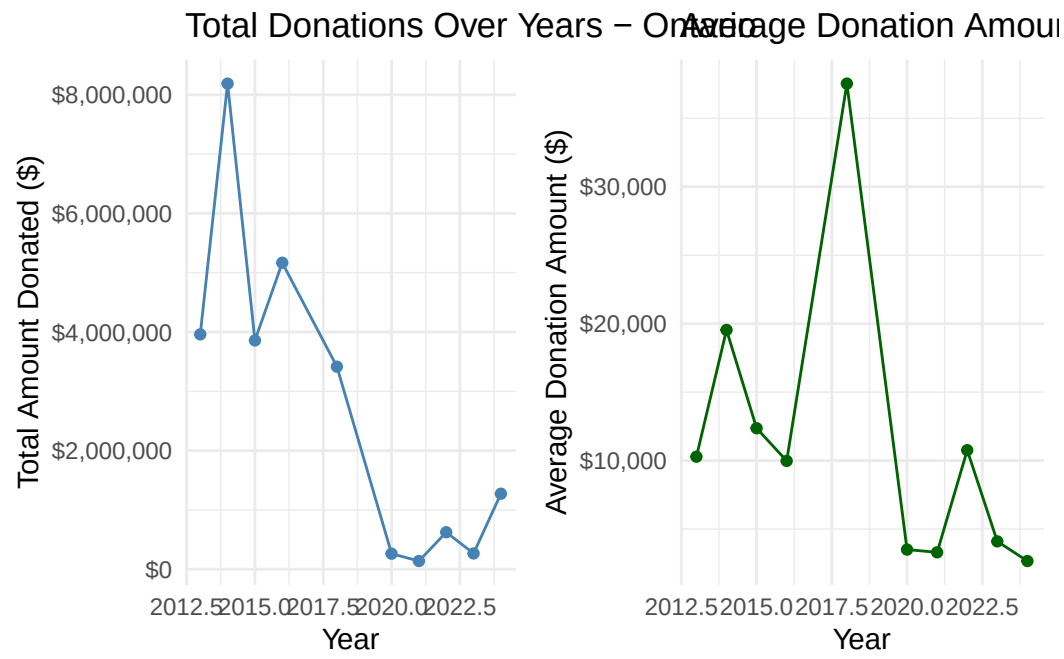

Figure 1: Total and Average Donations Over Years in Ontario

Figure 3 displays the total donations by political party in Ontario.

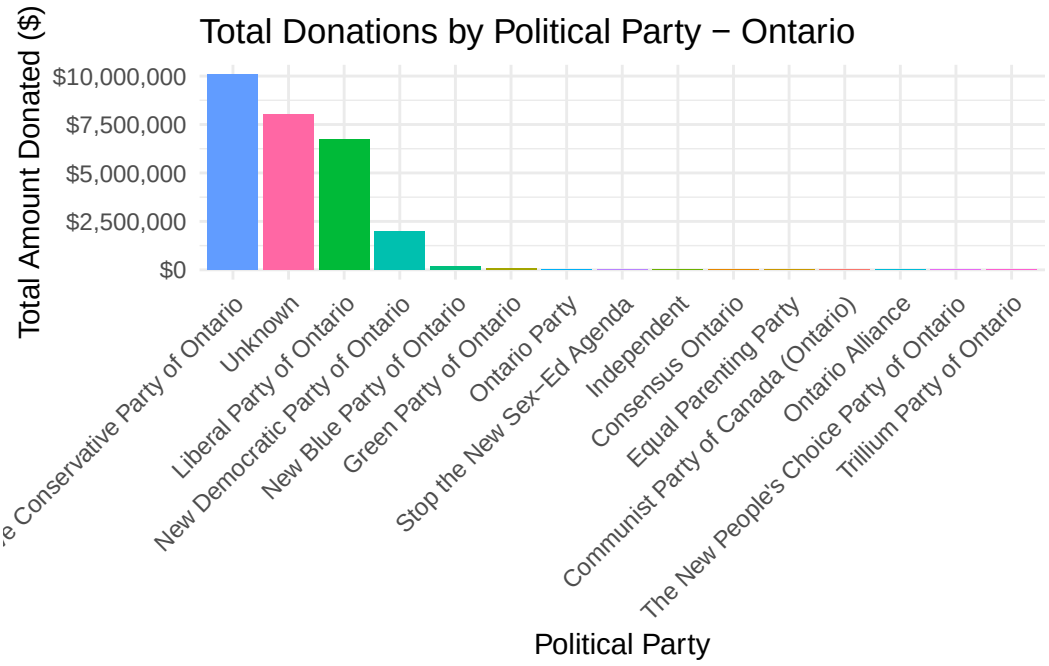

Figure 3: Total Donations by Political Party in Ontario

2.6.1.2 Federal

Similarly, Table 2 shows the donations at the federal level.

Similarly, Figure 2 shows the total and average donations over the years at the federal level.

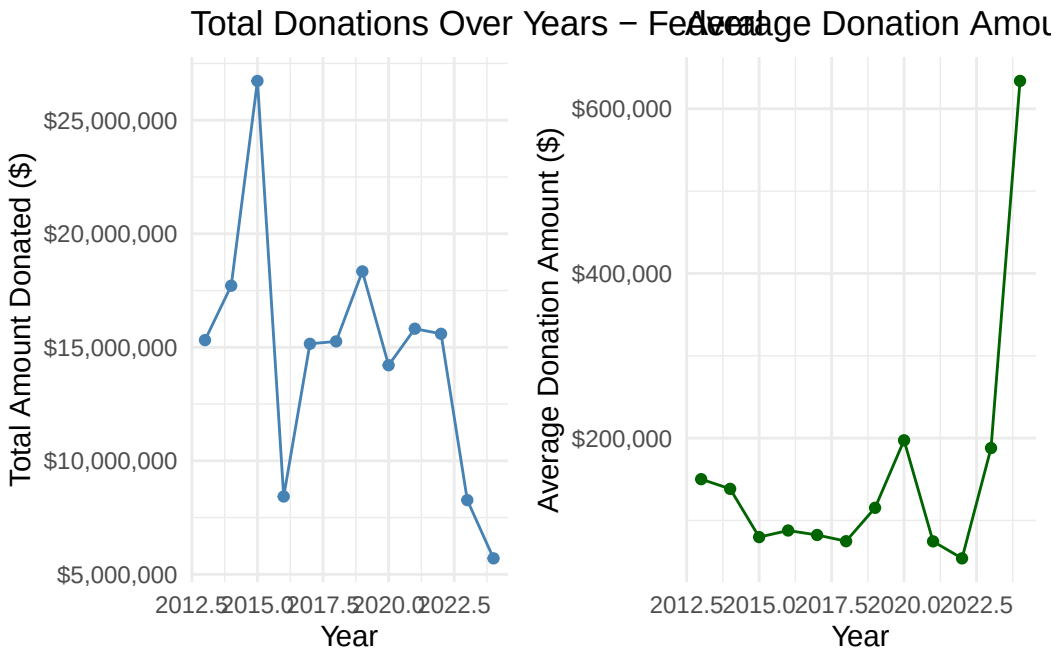

Figure 2: Total and Average Donations Over Years at Federal Level

Figure 4 shows the total donations by political party at the federal level.

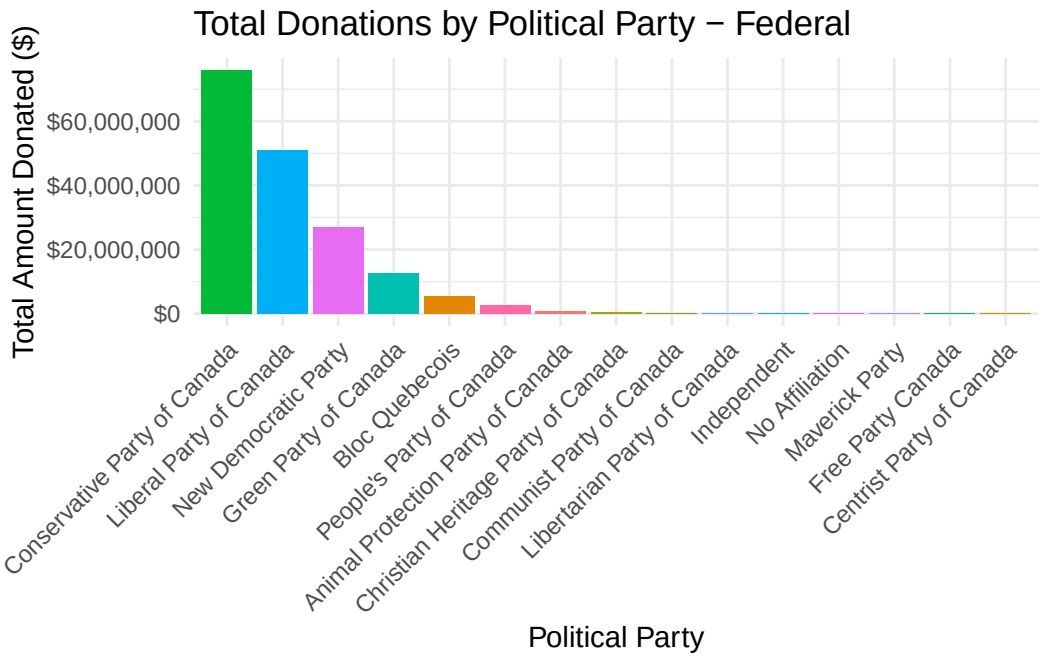

Figure 4: Total Donations by Political Party at Federal Level

2.7 Relationships Between Variables

Preliminary analysis indicates that political parties not in power receive higher total donations on average compared to those in power, at both federal and provincial levels. This trend suggests that donors may be motivated to support opposition parties to influence political change.

Additionally, major parties consistently attract more donations than minor parties, highlighting the importance of party prominence in fundraising efforts.

3 Model

The goal of our modelling strategy is twofold. Firstly,...

Here we briefly describe the Bayesian analysis model used to investigate... Background details and diagnostics are included in Appendix C.

3.1 Model set-up

Define y_i as the number of seconds that the plane remained aloft. Then β_i is the wing width and γ_i is the wing length, both measured in millimeters.

$$y_i|\mu_i, \sigma \sim \text{Normal}(\mu_i, \sigma) \tag{1}$$
$$\mu_i = \alpha + \beta_i + \gamma_i \tag{2}$$
$$\alpha \sim \text{Normal}(0, 2.5) \tag{3}$$
$$\beta \sim \text{Normal}(0, 2.5) \tag{4}$$
$$\gamma \sim \text{Normal}(0, 2.5) \tag{5}$$
$$\sigma \sim \text{Exponential}(1) \tag{6}$$

We run the model in R (R Core Team 2023) using the `rstanarm` package of Goodrich et al. (2022). We use the default priors from `rstanarm`.

3.1.1 Model justification

We expect a positive relationship between the size of the wings and time spent aloft. In particular...

We can use maths by including latex between dollar signs, for instance θ.

4 Results

Our results are summarized in **?@tbl-modelresults**.

5 Discussion

5.1 First discussion point

If my paper were 10 pages, then should be be at least 2.5 pages. The discussion is a chance to show off what you know and what you learnt from all this.

5.2 Second discussion point

Please don't use these as sub-heading labels - change them to be what your point actually is.

5.3 Third discussion point

5.4 Weaknesses and next steps

Weaknesses and next steps should also be included.

A Appendix

A.1 Appendix A: Data Cleaning Notes

The data cleaning process was meticulously carried out to ensure the dataset's reliability and consistency. The key steps included:

1. **Importing Raw Data:**
    - The raw donation data was imported using the `read_csv` function from the `tidyverse` package.
    - Data from PDF sources were converted to CSV using OCR tools such as Adobe Export PDF and ABBYY FineReader, followed by manual verification to correct OCR-induced errors.
2. **Handling Missing Values:**
    - Missing values in critical variables (`amount_donated`, `recipient_in_power`, `party_size`, `election_year`) were addressed by excluding incomplete records to maintain data integrity.
3. **Standardizing Party Names:**
    - Political party names were standardized across all jurisdictions. For example, variations like "Progressive Conservative," "Progressive Conservative Party of Ontario," and "The Progressive Conservative Association of Ontario" were consolidated into "Progressive Conservative Association of Ontario."
4. **Removing Outliers:**
    - Donation amounts exceeding three standard deviations from the mean were identified and removed to prevent skewing the analysis.
5. **Aggregating Donations:**
    - Donations were aggregated at the party-year level, resulting in a dataset where each row represents the total donations received by a party in a given year.
6. **Creating Binary Variables:**
    - Binary indicators were created for `recipient_in_power`, `party_size`, and `election_year` to facilitate regression analysis.
7. **Log Transformation:**
    - The `log_total_donations` variable was created by taking the logarithm of `Total_Donations + 1` to normalize the distribution and handle zero values.
8. **Final Verification:**

- The cleaned dataset was cross-validated against original records to ensure accuracy and consistency.

Appendix

B Additional data details

C Model details

C.1 Posterior predictive check

In **?@fig-ppcheckandposteriorvsprior-1** we implement a posterior predictive check. This shows…

In **?@fig-ppcheckandposteriorvsprior-2** we compare the posterior with the prior. This shows…

C.2 Diagnostics

?@fig-stanareyouokay-1 is a trace plot. It shows… This suggests…

?@fig-stanareyouokay-2 is a Rhat plot. It shows… This suggests…

References

Goodrich, Ben, Jonah Gabry, Imad Ali, and Sam Brilleman. 2022. "rstanarm: Bayesian applied regression modeling via Stan." https://mc-stan.org/rstanarm/.

R Core Team. 2023. *R: A Language and Environment for Statistical Computing*. Vienna, Austria: R Foundation for Statistical Computing. https://www.R-project.org/.