Finnish Parliament Election 2023: How do total funding and advertising campaigns affect the likelihood of a candidate being elected to Finnish Parliament?

1. Introduction

The aim of the study is to reveal the relationship between financial resources and success in political campaigns, focusing on the 2023 Finnish parliamentary elections. We explore a critical question:

*How do total funding and advertising campaigns affect the likelihood of a candidate being elected to Finnish Parliament?*

Our analysis begins with a review of the preexisting knowledge about the topic. We proceed by detailing the methodology of our data collection, conducted by the National Audit Office of Finland (NAOF). In the subsequent sections, we apply economic theories and analytical methods to interpret the data. The culmination of this report will be an analysis of the results, leading to conclusions that not only highlight the impact of funding and advertising on electoral success but also suggest potential areas for future research. The relevance of this research lies in its potential to unravel the complexities of electoral influence and to contribute to a more transparent political process.

2. Motivation

“How money affects elections” - this is a story as old as the hills and remains as a topic of heated debate. There has been various research conducted on this topic in multiple countries. And many of the results suggest that money and political success does go in hand, especially in the United State.

However, as of our latest findings at 1:26pm on 01.04.2024, there has been an absence of research on how funding and advertising campaigns may impact electoral outcomes in Finland. So, to satisfy our curiosity, we decided to find out how financial resources can shape the political terrain, especially in Parliamentary elections. By conducting this research, we hope to contribute to a more informed and equitable electoral process that empowers voters and strengthens the democratic core value of Finland.

Understanding the dynamics and impact of campaign funding in electoral processes goes beyond academic scope: it is a tool for political transparency and effective campaign strategies. By analyzing the effects of funding and its allocation in advertising, this research helps one to understand how such factors can sway election outcomes, offering a clearer picture of the mechanisms through which money operates within political campaigns.

Our study contributes to greater transparency in political campaigning which can empower voters with more information about the effect of funding raised. The results obtained can also provide valuable insights for future candidates, guiding their strategic planning and resource allocation.

3. Pre-existing knowledge

common sense: more money => stronger ad campaign => more exposure => increases the chance of getting elected.

when we checked that it wasnt the case

4. Data

4.1. Data selection

We chose to focus specifically on government elections rather than presidential elections. The primary reason for this selection is the larger number of candidates in government elections, which provides a richer dataset for analysis. Government elections offer thousands of observations compared to the tens typical in presidential races, thereby enhancing the statistical robustness of our findings. To ensure the relevance of our analysis, we decided to study only the latest government election.

The data for our research comes from the National Audit Office of Finland (NAOF). NAOF is responsible for publishing election funding disclosures in Finland. This official source ensures the reliability and authenticity of the data. Among the four types of data files released by NAOF for each election, 1) *funding rows for advance disclosures*, 2) *funding sources and expenses itemised in advance disclosures*, 3) *funding rows for election funding disclosures*, and 4) *funding sources and expenses itemised in election funding disclosures*, we opted to use 1) *the funding rows for advance disclosures.* This dataset was selected because it aligns best with our research goals, as this data set contains candidates who got elected and also candidates who didn't.

Due to Act on a Candidate’s Election Funding (273/2009) our data will only remain available online for 30 days after the confirmation of the election results. Therefore, we had to directly request the data from the organization NAOF via email.

4.2. Dataset

4.2.1. Dataset description

The advance disclosure is voluntary and contains a plan for election campaign expenses and funding. Although the announced amounts may not be completely accurate, we choose to accept the trade-off between certainty (disclosure data set) and uncertainty (advance disclosure data set) to obtain our research setting, so the dummy variable for candidate being elected or not.

To obtain the highly significant variable *elected*, we used another data set *funding rows for election funding disclosures* and with merging those two data sets we defined candidates that got elected. This additional data set had no other significance to our study.

The final data set, *the funding rows for advance disclosures,* contains 42 variables and 1197 observations. The merged data set, *funding rows for election funding disclosures,* contains 41 variables and 273 observations.

4.2.2. Data preprocessing



5. Empirical Model

*5.1 Main models*

Owing to the need of interpreting the regression function as a conditional probability, i.e our dependent variable is a binary variable (whether or not a candidate with certain characteristics would be elected to Finnish government), we decided to work with nonlinear regression models logit and probit, which perform more optimally in this case, compared with linear probability model. The fundamental difference between logit and probit models lies in their error terms: the error term of logit is of extreme value distribution, while that of probit follows standard normal distribution.

* + 1. Logistic regression

In statistics, logistic model models the log-odds (ln(p/(1-p))) of a situation as a linear combination of independent variables. In regression analysis, logistic regression is often used to estimate the probability of an event occurring. Wikipedia

Logistic regression is the log of maximum likelihood, so if you perform the monotonic log transformation, u would eventually have that e, not sure where to put maximum likehood, whether at the beginning or at the end like rn.

1. The effect of total funding on being elected

where

Y: binary dependent variable

: Total funding variable

: Intercept term

: Coefficient of total funding variable

1. The effect of advertising campaigns on being elected

where

Y: binary dependent variable

: Advertising campaign variables

: Intercept term

: Coefficient of the corresponding advertising campaign variables

* + 1. Probit regression

where Y: binary dependent variable,

: cumulative distribution function (CDF) of standard normal distribution, and

: regressors, for

1. Effect of total funding on being elected
2. Effect of advertising campaigns on being elected
   * 1. Maximum likelihood

Coefficients of both models can be estimated using maximum likelihood estimation, which produces parameters of an assumed probability distribution by maximizing likelihood that observed data are produced, under the described model.

5.2. Complementary implementation

1. Variable selection: backward selection, forward selection, and Akaike information criterion (AIC)

In our project, we cooperated backward selection and forward selection with AIC to select significant variables for our models.

Backward selection and forward selection are both based on p-values; however, while backward selection begins with a full model and removes least important variables one-by-one, forward selection begins with an empty model and adds most important variables one-by-one. Using these methods is relatively simplistic and natural, but it may miss out on the optimal model; thus, AIC was chosen to support the progress.

AIC is a metric that compares models based on log-likelihood but penalizes for a large number of variables. The model which yields the smallest AIC should be chosen.

1. Multicollinearity: Variance Inflation Factor (VIF)

Besides correlation matrix, we also included VIF in our assessment process, which measures multicollinearity in regression analysis. It is calculated separately for each explanatory variable: an explanatory variable has when it is uncorrelated with others, and when multicollinearity is likely present.

* 1. Key assumptions

To maintain the validity of our models, there are four main assumptions that we must follow:

1. Independence of error

The observations are independent of each other: the probability of one observation having a certain outcome should not be affected by the outcomes of other observations.

In our project, each observation represents a unique candidate. According to Finnish Parliamentary election’s rule, each citizen casts their vote privately, without knowing other voters’ choices, hence, it’s unlikely that the electoral outcome of one candidate is influenced by other candidates’ outcomes.

1. Linearity in parameters

In logit and probit model, we assume that the relationship between predictor variables and the log-odds (logistic regression) or cumulative distribution function (probit regression) is linear.

1. Absence of multicollinearity

Multicollinearity is when two or more predictor variables are highly correlated with each other. This can skew the standard errors and produce unstable coefficient estimates.

Since our model measuring the effect of total funding on being elected only contains one independent variable, it’s impossible for multicollinearity to happen. To assess multicollinearity in our second model, the effect of advertising campaigns on being elected, we employed VIF.



Overall, the VIF of predictor variables are very low, with a mean of 1.89, which means it’s highly unlikely that there exists multicollinearity.

1. No strongly influential outlier

diagnostics plot

6. Analysis and result

6.1. Regression analysis and interpretation

6.1.1. The effect of total funding on being elected

Logit model:

A screenshot of a computer

Description automatically generated

A screenshot of a computer

Description automatically generated

Probit model:

A screenshot of a computer

Description automatically generated

A screenshot of a computer

Description automatically generated

After implementing probit and logit models, we obtained the results such that the marginal effects of total funding on the probability of being elected is similar for both models, which is about .0000117. These values suggest that the total funding has a positive correlation with the chance of getting into the government; however, the effects are as close as trivial, indicating that the relationship is massively weak, and that high funding is highly unlikely to guarantee a candidate a position in the parliament. The p-value has a significant level of 0, meaning that the estimate is statistically significant.

6.1.2. Effect of ad campaign





Before executing the statistical models, we performed forward selection backed up with AIC method, after which variable other\_platform was determined to be excluded from our models. From the tables above, the estimates for marginal effect of each advertising channel are minimally varied across models. Overall, except promoting oneself at a public event, other forms of advertising increase the probability of getting selected into the governmental body. Assessing the p-values, we noticed that variable newspaper is of significance level of 0, outdoor\_ad and purchases are of significance level of 5%, and ad\_design is of significance level of 10%. The magnitude of all estimated coefficients slightly different from 0, proposing that advertising itself does not define an electoral success.

6.1.3. Effect of funding sources



Implementing variable selection procedure, we decided to keep all variables.

6.2. General result

Based on the findings in sections 6.1 and 6.2, it can be concluded that total funding and advertising campaigns do not significantly impact the likelihood of securing a parliamentary seat. Although there is a positive correlation between funding and certain forms of advertising with the probability of being elected, these effects are modest and do not guarantee the chance of getting one’s foot into parliament.

6.3. Implications and limitations

One likely limitation is the generalizability of this research since it yields not so significant result, and we only analyze 1 election - outcomes can be swayed by unique events, issues of our research election cycle.

The dataset only contains candidates that chose to report their fundings, not all participated candidates; hence, there might be underlying bias.

7. Conclusion

8. Appendix

9. References

https://www.vaalirahoitusvalvonta.fi/en/frontpage/electioncampaignfunding/searchelectionfundingdisclosures.html