

My title*

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October 20, 2024

Compiled polling surveys regarding the 2024 United States presidential election were analyzed in this report based on data from FiveThirtyEight (FiveThirtyEight 2024b). From the analysis, bayesian and generalized linear models were built to forecast the outcome of the presidential election based on popular vote and the electoral college system. The models forecast Kamala Harris as the winner of the US presidency. Election forecasting is crucial for informing voters, guiding campaign strategies, and engaging the public in the electoral process. Additionally, it helps predict potential policy shifts and holds political institutions accountable, contributing to a more transparent and informed democracy.

1 Introduction

Every four years, the United States presidential election occurs and is one of the most significant political events internationally. The complex process of the election involves both the popular and electoral college system, in which voters cast ballots on election day in each state. The candidate that receives the popular vote by the voters wins the electoral votes for that state (Weber 2024). After the popular vote is accounted for, the candidate who receives the majority of the electoral votes from all states wins the presidential election. The number of electoral votes varies by state and is proportional to each state's respective population (Weber 2024). Specifically for the 2024 presidential election, the top candidates include Donald Trump and Kamala Harris, both with differing opinions on key topics such as immigration, technology, abortion, and transatlantic affairs. For example, regarding technology, both parties are concerned with the rapid progression of artificial intelligence's capabilities but differ in the response and regulation of it. Republicans believe that the current practices are unfair and disproportionately target their voices, whereas democrats generally are in favor of tighter regulation (NBC, n.d.). Another key issue important to voters and the candidates is abortion. As former president, he supported restrictions on abortion access and advocated for policies that align with the conservative movement's opposition to abortion rights (McKenzie Beard and Abbie Cheeseman and Justine McDaniel 2024). On the other hand, Harris has been a key supporter in the pro-choice movement and has been an advocate for protecting and expanding access to abortion services, as well as female autonomy (Chad de Guzman and Koh Ewe 2024). The outcome of this election will have profound consequences for various legislative policies and the future direction of the United States.

To forecast the 2024 United States presidential election, a generalized linear model and bayesian model were built. Our goal is to determine who will win the election based on the electoral college system. A key finding from our model is that we predict Kamala Harris to win the presidential election. This would be a historic win, as she would be the first woman to become US president. This would represent a significant

*Code and data are available at: <https://github.com/Ford-Robert/us-presidential-election>.

milestone in breaking barriers related to gender and racial representation in the highest levels of American politics, symbolizing progress toward a more inclusive and diverse political landscape. One drawback of our model stems from representativeness of the dataset, as it does not include all 50 states in the polls, which may impact the electoral college votes.

This paper is broken down into various sections, including Data, Modeling, Results, Discussion, Conclusion, and Appendices. This paper uses data made available by FiveThirtyEight (FiveThirtyEight 2024b) which compiles individual polling surveys based on state and methodology. Section 2 explores the data, highlighting key aspects that may be useful to future policymakers or campaign strategists, as well as details the variables present in the dataset. Section 3 presents the models that were built and used to forecast the election. Section 4 details the conclusions of our model and Section 5 explores possible implications and insights of our conclusions. Section A include an idealized methodology and survey that we could hypothetically run, with the task of forecasting the US presidential election. This section also includes an in-depth analysis of one specific pollster’s methodology found within the larger dataset.

2 Data

The dataset used was obtained through FiveThirtyEight Interactives (FiveThirtyEight 2024b) and is focused on the United States presidential general polls for 2024. The polling data extracted are polling averages, where FiveThirtyEight (FiveThirtyEight 2024a) includes individual polling data from all publicly available polls that meet their ethical and methodological standards and at minimum, must test Harris versus Trump, the two primary presidential nominees for each political party. From the individual polls, FiveThirtyEight (FiveThirtyEight 2024a) will reweight and adjust the polls based on a few criteria, such as poll sample size, how recent it is, and house effects. The individual poll data is then added to the dataset, which is accessible for us to use. This dataset is crucial to help us build a model to forecast the 2024 US Presidential election and can help us analyze key features in voter habits for future political analysis.

There were two other potential datasets that could have been used, titled “Presidential Polling Averages” and “President Primary Polls”, both found through FiveThirtyEight (FiveThirtyEight 2024a). The “Presidential Polling Averages” dataset only included data from the Biden versus Trump election in 2020 and was not updated to include data for the upcoming 2024 election and therefore inadequate. The “Presidential Primary Polls” dataset included very similar information as our chosen dataset, however, it included candidates that have since dropped out or were not major running candidates, such as Nikki Haley and Michelle Obama. It includes observations that are unnecessary and creates noise, therefore we did not choose this dataset either.

The variables used in the dataset include pollster name, pollster weight, method, state, sample size, pollscore, collection/end date, transparency score, candidate, support percentage, election date, days to election, initial weight, weight, and poll region. Pollster Name indicates which pollster the individual poll came from, which varies from individual companies, such as YouGov, to research institutions, such as Quinnipiac University and the weight is assigned by FiveThirtyEight depending on sample size and if they have multiple polls out in a short time. This is to adjust for any bias. Method is the way the poll was deployed, including but not limited to live phone, online panel, and text-to-web. State indicates which state the poll was conducted. State indicates what state the poll was conducted and sample size is the size of the poll. The pollscore is the rating FiveThirtyEight gives each individual poll, on factors such on ethical and methodological elements. The candidate variable indicates the candidate a certain percentage of people in the poll voted for and “support percentage” represents that specific number. The election date and days to election variables indicate how far out the poll was conducted with respect with the election date of November 5, 2024. We also reorganized the dataset to include a poll region, which divides the US into geographical regions such as rust belt, northeast, etc.

Table 1: First few observations of cleaned data set

pollster	numeric_grade	pollscore	end_date	transparency_score	question_id	method
InsiderAdvantage	2.0	-0.3	2024-10-08	5	212039	Text
InsiderAdvantage	2.0	-0.3	2024-10-08	5	212039	Text
Research Co.	2.4	-0.5	2024-10-07	6	211928	Online Panel
Research Co.	2.4	-0.5	2024-10-07	6	211928	Online Panel
Research Co.	2.4	-0.5	2024-10-07	6	211929	Online Panel

state	sample_size	candidate	support	election_date	days_to_election	initial_weight	weight	pol_region
Pennsylvania	800	Harris	47	2024-11-05	28	0.8164966	0.9502238	Rust
Pennsylvania	800	Trump	49	2024-11-05	28	0.8164966	0.9502238	Rust
Michigan	450	Harris	51	2024-11-05	29	0.8944272	1.0409180	Rust
Michigan	450	Trump	48	2024-11-05	29	0.8944272	1.0409180	Rust
Pennsylvania	450	Harris	50	2024-11-05	29	0.8944272	1.0409180	Rust

The table details the first few observations of the cleaned dataset, which we used to build our model.

For further analysis, the cleaned dataset was separated into two different datasets by beach name, for simplicity purposes. Data was analyzed through the R programming software (R Core Team 2023) and packages such as tidyverse (Wickham et al. 2019), ggplot2 (Wickham 2016), knitr (Xie 2014), and dplyr (Wickham et al. 2023) were used to help download, clean, simulate, analyze, and test the data.

Some pollsters are included in the dataset more than others based on the frequency of their conducted poll surveys and if they align with FiveThirtyEight’s guidelines, which can be seen in Figure 1. Figure 1 highlights the distribution of the top 25 pollsters and how frequently they appear in the dataset, with Morning Consult being the most popular pollster with almost 500 appearances. Noting which pollsters are more trustworthy and provide reliable data is important for evaluating the quality of future analyses.

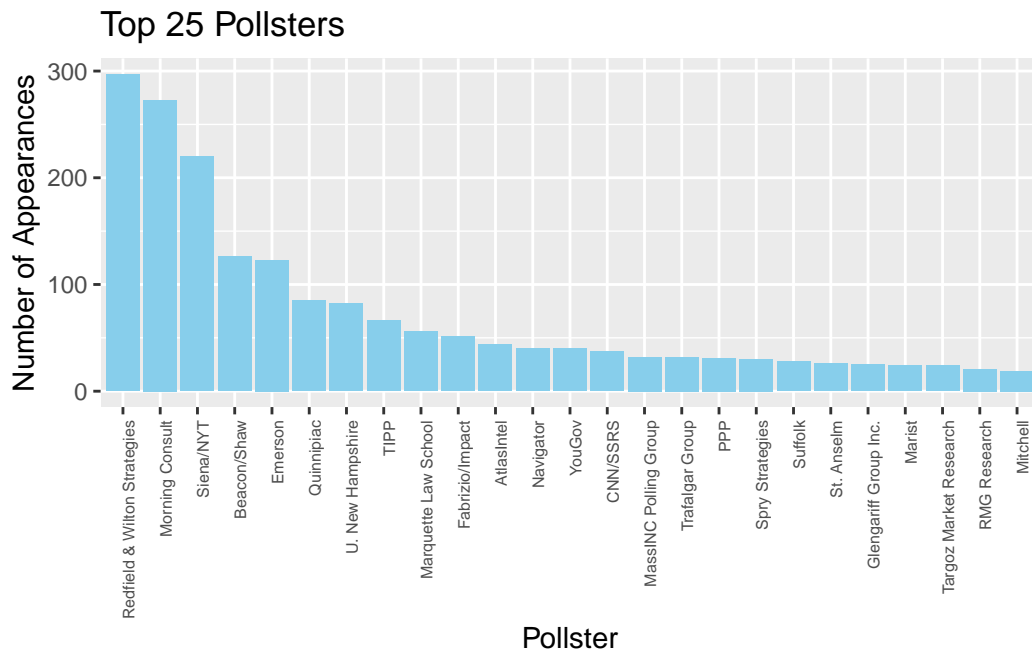


Figure 1: Top 25 pollsters in overall polling data

Figure 2 details the frequency of various polling methods used in the individual polling data, showing online panels are the most popular methodology used to deploy these polls, followed by live phone. The polling method plays a crucial role in reducing certain response biases. For instance, if the poll is conducted via an online panel with anonymous responses, participants may feel more comfortable expressing their true voting intentions, potentially reducing social desirability bias.

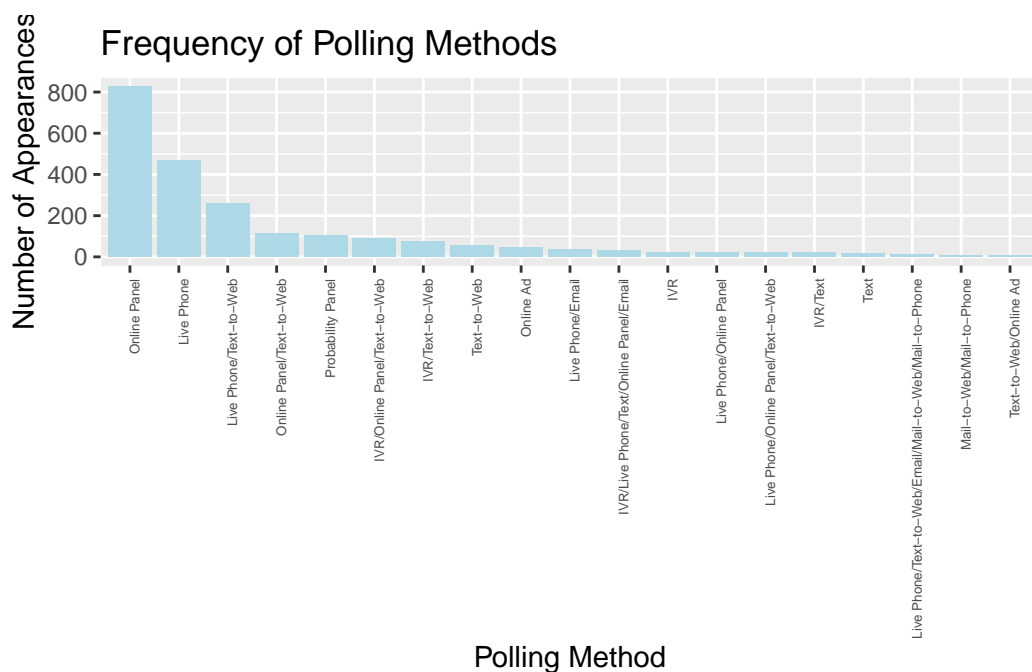


Figure 2: Frequency of Various Polling Methods

Finally, Figure 3 shows the number of votes per candidate. As expected, Harris and Trump have the highest number of votes, with Harris having slightly more votes based on the surveyed polls than Trump. Other candidates with a noticeable number of votes in the graph include Robert F. Kennedy and Jill Stein. However, their totals are significantly lower than those of Harris and Trump, making them likely insignificant in the election. It is also important to mention that Biden still appears in these polls, and therefore in Figure 3, due to the lag time in poll data processing by FiveThirtyEight. However, since he has dropped out of the race, he will not be included in our model.

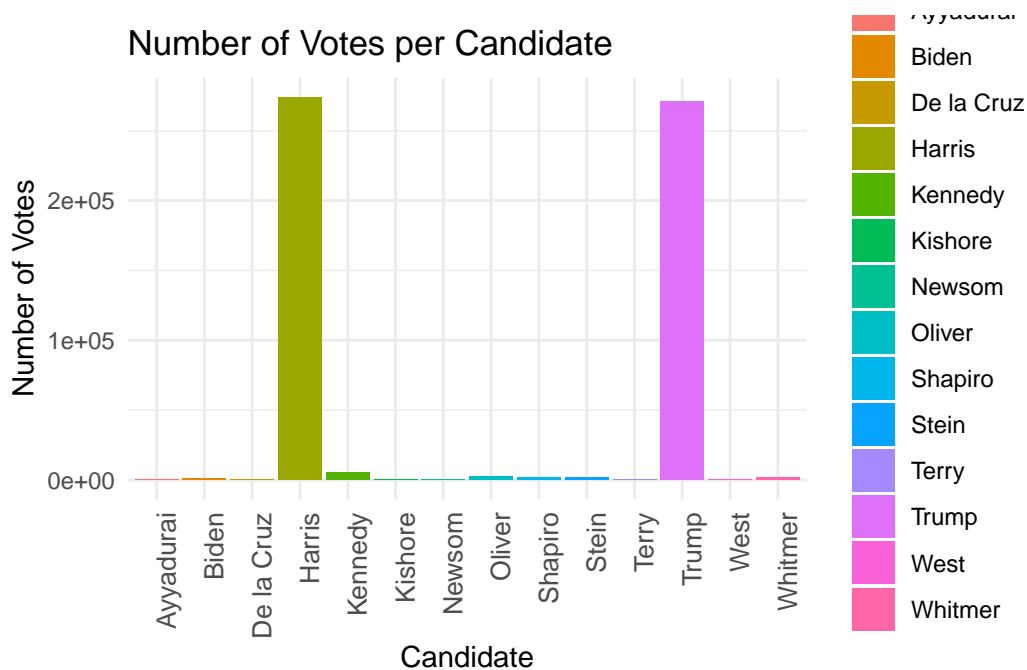


Figure 3: Number of Votes per Candidate

3 Model

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

3.1 Model set-up

3.1.1 Model justification

4 Results

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

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5.3 Third discussion point

5.4 Weaknesses and next steps

Weaknesses and next steps should also be included.

A Appendix

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