Executive Summary Report

Through a careful exploration of the relationship between the dollar amounts of contributions received from various industrial sectors and the likelihood of members of Congress voting against their own party, many insights such as congressional voting behavior, financial transparency, and policymaking have been discovered. Understanding this relationship is crucial for government accountability organizations to uphold transparency and ensure elected officials remain accountable. Our analysis also serves to illuminate any potential conflicts of interest or undue influence present in our United States Congress.

The investigation looks at voting behavior of the United States Congress between 2006 and 2012. Our study focused on determining *whether donations from various industrial sectors (mainly Energy, Healthcare, Transportation, Financial, and Environment) affected the likelihood of a congressman voting against the majority of his political party on bills and joint resolutions*. Both bills and joint resolutions were analyzed since there is no real difference between a joint resolution and a bill except for a joint resolution being used for continuing or emergency appropriations.

Data was gathered from multiple reputable sources, including databases form Stanford University and the Federal Elections Commission. The datasets (with millions of entries) were merged together based on information on congressional candidates, campaign contributions from Fortune 500 companies, congressional bills, and voting records. The data's relevancy and accuracy was ensured through a comprehensive data filtering and cleaning process.

The analytical approach focused on filtering relevant data to include only congressmen who won general elections and participated in voting between 2006 and 2012, identifying whether contributions from specific industry sectors influenced congressmen to vote against their

party's majority on specific bills, and finally employing statistical models like logistic regression and decision trees to analyze the data, aiming to reveal complex relationships and patterns.

Each sector's donations are the total from companies within that sector, within the previous election cycle. For example, if the model is predicting a vote for a bill in 2011, which is the Congressional session from January 2011 to December 2012, then the donations come from the most recent election cycle for the candidate; in this case, the 2010 cycle. All models had statistically significant values for calculating the probability, making them more reliable.

Sector	50th Percentile Donation	80th Percentile Donation	Probability with 50th Percentile Donation Amount (Median)	Probability with 80th Percentile Donation	Dollars per Percent Change
Energy	$9,474,066	$20,351,410	12.0%	13.2%	$9,064,453
Healthcare	$5,619,272	$14,048,181	7.8%	17.6%	$860,092
Transportation	$16,566,425	$24,849,638	16.8%	21.1%	$1,926,329
Financial	$6,648,624	$12,177,782	12.8%	16.0%	$1,727,862
Environment	$8,684,337	$16,974,213	11.9%	13.1%	$6,908,230

Figure 1: Giving the 50th and 80th percentile donation amounts, along with their predicted probabilities.

The analysis indicated varying impacts of political donations across different sectors. For instance, contributions from the **healthcare** sector (Fig. 1) showed notable differences in dollars influencing voting behavior compared to other sectors. The models suggested that higher amounts of donations were associated with a higher likelihood of congressmen voting against their party's majority. Looking at the number of dollars to increase the likeliness of voting, it requires the least amount, with only $860,000 required to increase the probability of voting

against party by 1%, compared to the next smallest which is greater than 1 million more dollars to increase the likeliness by 1%. Healthcare also has low donation amounts for the 50th and 80th percentiles, which is interesting because that means there is less total donations required to increase the probability by a large amount. It is also important to remember that this number is an aggregate of all the donations in the previous election cycle from that sector, so that means these donation totals come from aggregating multiple companies. This places an importance on watching out for donations by healthcare companies to Congressmen, since this number is easily reachable and more opaque when the donations come from multiple sources.

As for the Governmental Accountability Office, it is recommended that the oversight bodies consider these findings to evaluate the current political contributors and the bills they vest the most interest in. Further studies could also expand on this work to include more recent data and explore additional variables that may affect voting behavior in Congress.