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Money matters: An analysis of campaign finance in United States House of Representatives elections, 2010-2016

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MONEY MATTERS: AN ANALYSIS OF CAMPAIGN FINANCE IN

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Introduction

Money in politics is the single largest threat to the democratic system in the United States. It influences everything in politics, from the candidates to the issues debated. Every American knows that running for office requires large amounts of funding, and being elected requires even more. People worry that only the wealthiest voices are being heard; of course, candidates who depend on money from wealthy donors for campaign strength would never support unfavorable policies for their donors. Clearly, money in politics threatens the core democratic principles upon which America was founded. However, few people discuss whether the money really makes a difference in elections, and much of the outstanding literature on the impact of campaign funding on election results dates back over twenty years. To make things worse, each study uses different methodologies, so their results are difficult to compare. Since these studies were published, the way that candidates finance their campaigns has completely changed. The *Citizens United* decision in 2010 allowed corporations and political action committees, or PACs, to play a major role in campaign funding. Still, funding is a strong predictor of election outcomes; a large amount of funds indicates campaign strength for challengers but campaign weakness for incumbents. The impact of campaign finance can depend on the source of funding. Incumbents tend to gain most from individual donations, while challengers gain the most from PAC donations. Without serious consideration of campaign finance reform, money will continue to be the primary source of campaign strength and the wealthy will continue to influence elections.

Literature Review

Influence of Campaign Funding on Election Outcomes

Previous literature focused on the relative impacts of incumbents' and challengers' spending. As a challenger increased her campaign spending, the better she did in elections. Not

only did her average vote increase, but the frequency of challenger victories grew (Jacobson, 1978, 1990, 2006). One possible explanation is that in order to gather voter support, the candidate must first become familiar to the voters. Then on Election Day, voters select candidates whom they recognize. Spending campaign funds on advertising and other modes of marketing increases the probability that a voter will become familiar with a particular campaign and will subsequently support that candidate. McBurnett and McBurnett (1994) investigated which subsets of the population were more likely to be swayed by campaign spending. They observed that people with college degrees, people with an interest in political campaigns, and strong partisans were the least likely to be affected.

Incumbents have a distinct outlook on campaign expenditures because they enjoy what Jacobson (1978, 470) termed an "incumbency advantage." Because they should already be familiar to voters, incumbents do not need to spend as much campaign money to become recognized by voters (Glantz, Abramowitz, & Burkhart, 1976; Silberman, 1976; Grier, 1989; Jacobson, 1990; Abramowitz, 1991). Jacobson (1990) argued that voters will not turn against an incumbent without a viable replacement. Therefore, it has been shown that if an incumbent is required to spend large sums of money, they are less likely to be reelected -- not because their spending deters voters, but because they only spend excessively when a formidable challenger presents herself. In this way, incumbent spending is purely reactionary to challenger spending (Jacobson, 1978; Glantz et al., 1976). Ironically, this spending does little, if anything, to improve election prospects (Caldeira & Patterson, 1982; Jacobson, 1990; Levitt, 1994).

The campaigning period is crucial for challengers, especially, to reach voters with their message. Several studies found that as a challenger's expected vote count rose, their funding also rose (Jacobson, 1978, 1985, 2006; Giertz & Sullivan, 1977). After all, contributors are more likely

to raise funds for candidates they support. As a candidate garners additional supporters, these supporters will raise additional funding for the candidate. Therefore, it is difficult to determine a cause and effect relationship between candidate success and funding. In other words, strong candidates are able to gain funding, but funding also leads to winning elections. In statistics, this problem is called confounding bias, otherwise known as simultaneity bias. Because the expectations of election results cannot be modeled perfectly, the effect of challenger spending is often overstated while the effect of incumbent spending is understated.

Previous researchers tackled simultaneity bias in several ways. The first is by eliminating the variable for candidate funding altogether. Instead, they used the opponent's campaign expenditures to explain movement in voter support (Giertz & Sullivan, 1977). As a result, they were able to remove the influence that a candidate's spending had on their own voting, thereby eradicating simultaneity bias. Other researchers used other functional forms, such as two-stage least squares regression, in an attempt to define the cause and effect relationship between the two variables (Jacobson, 1985). Grier (1989) denounced simultaneity bias altogether by arguing that if campaign contributions are strictly based on expected candidate strength, then losing candidates should be known from the beginning of the campaign cycle and will not be able to attract any funds at all. However, that is not the case, since many losing candidates in past elections were able to adequately finance their campaigns. Due to a lack of standardization between these methods, the existing studies on the relative impact of incumbent and challenger spending on election results have been inconclusive.

The results set forth by these past investigations have had major government policy implications. First, because challengers are highly dependent on campaign funding to attract votes, any government restrictions that limit campaign contributions will favor incumbents. Therefore, it

is no surprise that Congressmen do not vote to eliminate spending limit laws (Glantz, Abramowitz, & Burkhart 1976; Abramowitz, 1991). The problem is exacerbated by the fact that incumbents receive fewer individual contributions than challengers, and that their contributions are smaller in size (Grier, 1989). Therefore, incumbents do not face the risk of losing funding if contribution limits are enacted.

The Role of PACs and SuperPACs

Political action committees, commonly known as PACs, have long played a role in campaign finance and election outcomes. These interest groups, who raise and contribute money to campaigns of candidates likely to support their ideology, were introduced in 1944. While PACs generally represent businesses, labor unions, or ideological interests, the process to create one is not restricted to these groups. PACs are currently limited to a $5,000 donation to a single candidate per election period, and $15,000 to a national party committee each year (The Center for Responsive Politics, n.d.). PACs generally focus their contributions on incumbents (Giertz & Sullivan, 1977; Welch, 1980). This suggests that PACs are more interested in gaining political favors than influencing elections. In other words, they devote their money to candidates who support their platform and have demonstrated an ability to win the election and advocate for their ideas. After all, money given to the loser will be wasted, since she will not be able to affect the legislature in the PAC's favor.

Since these relationships were investigated, several court cases have reformed the world of campaign finance. A landmark court decision regarding PACs was delivered by *Citizens United v. Federal Election Commission* (2010). The Supreme Court ruled that limits on corporate funding of independent political broadcasts in elections violate the First Amendment. This case is infamous for addressing corporate personhood, in that they hold the same First Amendment rights as

citizens. Just months after the *Citizens United* decision, *SpeechNow.Org v. Federal Election Commission* (2010) asserted that contribution limits on other groups and individuals were unconstitutional as well, following the same logic as *Citizens United.*

More recent literature has investigated how the *Citizens United* decision has affected the incumbency advantage. Jacobsen (2014) argued that growing party loyalty has diminished this advantage in recent years. Fewer people are willing to vote for the opposite party, regardless of the incumbency status of the candidates. Therefore, incumbents are increasingly campaigning in districts where their challengers' parties are favored. With more money available to them, especially in districts that lean toward their party, challengers are able to respond to the incumbents' campaigns more effectively.

Citizens United has also had major implications on how campaigns are funded. In the aftermath of these court decisions, the Federal Election Commission reported a nearly 470% increase in independent expenditures by PACs, groups, and individuals (Bauerly, 2011). Specifically, PAC funding doubled between the 2008 and 2010 elections, and accounted for more than individuals, corporations, and unions combined. More importantly, the SuperPAC was born. These organizations raise unlimited sums of money from businesses, unions, and individuals to advocate for or against candidates, but cannot donate directly to the candidate's campaign. Because PACs are not required to disclose the sources of their funding, corporations and the wealthiest Americans are able to donate immense funds to support candidates who support favorable policies. Thus, the issue of PACs, especially SuperPACs, is hotly debated. However, it has yet to be determined whether these expenditures truly help a candidate secure a victory.

Methodology

Incumbent Votes Earned

To analyze the impact of campaign finance on the percentage of votes garnered by the incumbent, a multivariate ordinary least squares (OLS) regression model was employed:

$$IncVote\% = \beta_0 + \beta_1\ IncR2010 + \beta_2\ IncR2012 + \beta_3\ IncR2014 \qquad (1)$$

$$+ \beta_4\ IncR2016 + \beta_5\ Ln(TotInc) + \beta_6\ Ln(TotChall)$$

$$+ \beta_7\ Ln(IndInc) + \beta_8\ Ln(CommInc) + \beta_9\ Ln(CandInc)$$

$$+ \beta_{10}\ Ln(LoanInc) + \beta_{11}\ Ln(OtherInc) + \beta_{12}\ Ln(IndChall)$$

$$+ \beta_{13}\ Ln(CommChall) + \beta_{14}\ Ln(CandChall)$$

$$+ \beta_{15}\ Ln(LoanChall) + \beta_{16}\ Ln(OtherChall) + \varepsilon$$

The dependent variable, *IncVote%* is the percentage of the vote earned by the incumbent. *IncR2010, IncR2012, IncR2014*, and *IncR2016* are binary variables, which equal 1 if the incumbent was a Republican in the given election year, and zero otherwise. These variables capture whether a particular party was favored in any of the elections.

The next two variables, *Ln(TotInc)* and *Ln(TotChall)* measure the log-scaled total funding received by the incumbent and challenger, respectively. The incumbent's share of the vote is expected to rise when the incumbent's spending rises or the challenger's spending falls. A natural logarithm transformation is appropriate because it captures the diminishing marginal utility of funding. For example, a $1,000 donation is more valuable to a candidate with a $5,000 campaign than a $5 billion campaign. This methodology is common practice among studies involving monetary values.

The last ten variables categorize the contributions by source. *Ln(IndInc)* and *Ln(IndChall)* contain the log-scaled contributions from individuals for incumbents and challengers, respectively.

Similarly, the log-scaled donations received from PACs is included using the variables *Ln(CommInc)* and *Ln(CommChall)*. The variables *Ln(CandInc)* and *Ln(CandChall)* capture the candidate's own contributions to the campaign. *Ln(LoanInc)* and *Ln(LoanChall)* reflect the log-scaled loan values. Lastly, the natural log transformation for all other funding for incumbents and challengers is collected as *Ln(OtherInc)* and *Ln(OtherChall)*.

Following the notion that increased funding leads to more votes, each of the incumbent's regression coefficients are expected to be positive, and the challenger's regression coefficients to be negative, with one exception: incumbent's candidate donations. Because a candidate is likely to attempt to fundraise from other sources before donating from their own personal funds, the incumbent only donates to their own campaign when the race is hotly contested.

To mitigate simultaneity bias, a reduced model is estimated, which does not include the incumbent's categorical funding variables:

$$IncVote\% = \beta_0 + \beta_1\ IncR2010 + \beta_2\ IncR2012 + \beta_3\ IncR2014 \qquad (2)$$
$$+ \beta_4\ IncR2016\ + \beta_5\ Ln(TotInc) + \beta_6\ Ln(TotChall)$$
$$+ \beta_7\ Ln(IndChall) + \beta_8\ Ln(CommChall) + \beta_9\ Ln(CandChall)$$
$$+ \beta_{10}\ Ln(LoanChall) + \beta_{11}\ Ln(OtherChall) + \varepsilon$$

Margin of Victory

Another OLS regression model estimates the effect of campaign funding on the winner's margin of victory. This model takes a similar form as Equation 1, but replaces the incumbent's data with the winner's (and the challenger's with the loser's):

$$MOV = \beta_0 + \beta_1 \ WinR2010 + \beta_2 \ WinR2012 + \beta_3 \ WinR2014 \qquad (3)$$

$$+ \beta_4 \ WinR2016 \ + \beta_5 \ WinInc \ + \beta_6 \ Ln(TotWin)$$

$$+ \beta_7 \ Ln(TotLose) + \beta_8 \ Ln(IndWin) + \beta_9 \ Ln(CommWin)$$

$$+ \beta_{10} \ Ln(CandWin) + \beta_{11} \ Ln(LoanWin) + \beta_{12} \ Ln(OtherWin)$$

$$+ \beta_{13} \ Ln(IndLose) + \beta_{14} \ Ln(CommLose) + \beta_{15} \ Ln(CandLose)$$

$$+ \beta_{16} \ Ln(LoanLose) + \beta_{17} \ Ln(OtherLose) + \varepsilon$$

Here, the dependent variable, *MOV*, is the margin of victory, which is calculated as the difference in the percentage of the votes earned by the winner and the loser. One additional independent variable is included in the study: *WinInc*, which is a binary variable equal to 1 if the winner is the incumbent. Because incumbents enjoy an incumbency advantage, the associated regression coefficient is anticipated to be positive. The other regression coefficients in this equation are expected to have the same signs as in Equation 1.

Analogous to Equation 2, the model given in Equation 3 is reduced by removing the winner's categorical funding to mitigate simultaneity bias. This model is as follows:

$$MOV = \beta_0 + \beta_1 \ WinR2010 + \beta_2 WinR2012 + \beta_3 \ WinR2014 \qquad (4)$$

$$+ \beta_4 \ WinR2016 \ + \beta_5 \ Ln(TotWin) + \beta_6 \ Ln(TotLose)$$

$$+ \beta_7 \ Ln(IndLose) + \beta_8 \ Ln(CommLose) + \beta_9 \ Ln(CandLose)$$

$$+ \beta_{10} \ Ln(LoanLose) + \beta_{11} \ Ln(OtherLose) + \varepsilon$$

Data

The data used in this study was collected from United States House of Representatives elections from 2010 through 2016, which is available through the Federal Election Commission (n.d.). All dollars were adjusted for inflation to 2016 dollars using the Consumer Price Index. House of Representatives data was chosen because districts are drawn according to population.

Therefore, there was no need to adjust for population differences between elections. Because 2010 was the first election after the *Citizens United* decision, it serves as the first set of data. Data from the 2016 election is the most recent available.

Several elections were omitted from this study. The data points for open seats and uncontested races were discarded because the incumbency-challenger relationship is not present. Furthermore, the FEC only requires reporting campaign finance data if $5,000 or more was raised or spent by a candidate, though some candidates choose to do so even if this minimum is not met. Therefore, only elections in which both the incumbent and the challenger reported campaign finances are included in this study. Lastly, due to the small number of third-party candidates, only elections between the two major parties (Democrat and Republican) are studied.

The final dataset includes 1,802 elections over the course of four election years. Summary statistics can be found in Table 1. In the data, 86% of incumbents were reelected. The sample was skewed towards Republicans, with 56% of them winning their election. Both of these rates changed relatively little over the four election years. Surprisingly, the average spending by the winner, loser, incumbent, and challenger also varied very little over the election years. It is especially important to note that the average PAC spending did not change significantly over the four election years. In this way, the *Citizens United* decision appears to have had little impact on the role of PACs in campaign financing.

The 2012 election's average spending is unrepresentative of the bulk of the data due to a single election. In the state of Washington's first district, Susan Delbene, a Democratic challenger, spent $4.43 billion and won with 54% of the total vote. Because this figure is highly inflated compared to the other elections, the average winner spending and average challenger spending are

Variable	Description	Mean	Std. Dev.	Minimum	Maximum
Equations 1 and 2					
IncVote%	Incumbent's share of votes	0.6276	0.0905	0.1664	0.9095
IncR2010	Incumbent was Republican in a 2010 election	0.0989	0.2987	0	1
IncR2012	Incumbent was Republican in a 2012 election	0.1238	0.3296	0	1
IncR2014	Incumbent was Republican in a 2014 election	0.1294	0.3358	0	1
IncR2016	Incumbent was Republican in a 2016 election	0.1506	0.3579	0	1
Ln(TotInc)	Total Incumbent's Funding ($M)	1.6913	1.4575	0.0089	19.852
Ln(TotChall)	Total Challenger's Funding ($M)	4.7003	134.66	0.0001	4,430.0
Ln(IndInc)	Incumbent's Individual Contributions ($M)	0.8659	0.8989	0	14.372
Ln(CommInc)	Incumbent's PAC Contributions ($M)	0.7341	0.4825	0	3.2797
Ln(CandInc)	Incumbent's Own Contributions ($M)	0.0063	0.0773	0	2.0770
Ln(LoanInc)	Incumbent's Loans ($M)	0.0174	0.2527	0	8.0500
Ln(OtherInc)	Incumbent's Other Funding ($M)	0.0677	0.5322	-2.0002	12.398
Ln(IndChall)	Challenger's Individual Contributions ($M)	0.4000	0.6614	0	6.2489
Ln(CommChall)	Challenger's PAC Contributions ($M)	0.0924	0.1887	0	2.2103
Ln(CandChall)	Challenger's Own Contributions ($M)	0.0347	0.2869	0	4.2550
Ln(LoanChall)	Challenger's Loans ($M)	0.0736	0.3560	-0.0029	7.9051
Ln(OtherChall)	Challenger's Other Funding ($M)	4.0997	134.54	-1.1049	4,425.6
Equations 3 and 4					
MoV	Margin of Victory	0.2688	0.1600	0.0015	0.8191
WinR2010	Winner was Republican in a 2010 election	0.1497	0.3570	0	1
WinR2012	Winner was Republican in a 2012 election	0.1201	0.3253	0	1
WinR2014	Winner was Republican in a 2014 election	0.1368	0.3438	0	1
WinR2016	Winner was Republican in a 2016 election	0.1543	0.3614	0	1
WinInc	Winner was an incumbent	0.8622	0.3448	0	1
Ln(TotWin)	Total Winner's Funding ($M)	5.6969	134.63	0.0256	4,430.0
Ln(TotLose)	Total Loser's Funding ($M)	0.5947	1.0358	0.0001	10.873
Ln(IndWin)	Winner's Individual Contributions ($M)	0.8938	0.9165	0.0225	14.373
Ln(CommWin)	Winner's PAC Contributions ($M)	0.6999	0.4649	0	3.2797
Ln(CandWin)	Winner's Own Contributions ($M)	0.0170	0.1927	0	3.6868
Ln(LoanWin)	Winner's Loans ($M)	0.0288	0.1826	0	3.1626
Ln(OtherWin)	Winner's Other Funding ($M)	4.1575	134.54	-2.0002	4,425.6
Ln(IndLose)	Loser's Individual Contributions ($M)	0.3721	0.6146	0	5.0348
Ln(CommLose)	Loser's PAC Contributions ($M)	0.1265	0.3063	0	2.2843
Ln(CandLose)	Loser's Own Contributions ($M)	0.0240	0.2270	0	4.2550
Ln(LoanLose)	Loser's Loans ($M)	0.0622	0.3962	-0.0029	8.0500
Ln(OtherLose)	Loser's Other Funding ($M)	0.0099	0.0740	-1.1049	19.852

Table 1: Summary Statistics

highly skewed right. By removing Delbene's election from the computation, the averages return

to values similar to the other three election years, as shown in Table 2.

Year	N	Average Spending By Winner ($)		Average Spending By Challenger ($)	
		Including Delbene	Excluding Delbene	Including Delbene	Excluding Delbene
2010	320	1,436,112	1,546,112	699,829	699,829
2012	227	21,190,353	1,682,346	20,095,784	582,934
2014	255	1,758,099	1,748,099	530,991	530,991
2016	280	1,853,555	1,853,555	588,060	588,060

Table 2: Average Spending by Election Year

Results

Prior to examining the regression results, it is important to understand statistical and

practical significance. Statistical significance is a measure of the meaningfulness or reliability of

the results. If a statistic is significant at the 10% level, then we are 90% sure that the results are

not due to chance. Therefore, the smaller the significance level, the stronger the evidence is.

Practical significance is somewhat different; it examines the magnitude of the result. If a statistic

is practically insignificant, it means that it has such a small effect that, even if it is statistically

significant, it is not useful in the real world. Meaningful statistics require both statistical and

practical significance. For example, if it is determined that campaign loans are strongly correlated

with the number of votes received, but getting millions of dollars of loans only improves the

number of votes by 1%, then the relationship is said to have statistical significance and practical

insignificance.

Incumbent Votes Earned

Table 3 presents the coefficients and statistical significance levels for Equation 1 and 2.

First, the Republican binary variables performed as expected. In 2010, Republicans swept the

Equation	(1)	(2)
Intercept	1.18618	1.22154
IncR2010	0.0254 ***	0.02616 ***
IncR2012	-0.01102 *	-0.01114 *
IncR2014	0.01874 ***	0.01887 ***
IncR2016	-0.00602	-0.00639
Ln(TotInc)	-0.01332 **	-0.02370 ***
Ln(TotChall)	-0.01734 ***	-0.01753 ***
Ln(IndChall)	-0.00203	-0.00196
Ln(CommChall)	-0.00352 ***	-0.00365 ***
Ln(CandChall)	0.00037367	0.00044032
Ln(LoanChall)	-0.00093493 **	-0.00099487 **
Ln(OtherChall)	-0.00001507	-0.00011277
Ln(IndInc)	-0.00554	
Ln(CommInc)	-0.00232	
Ln(CandInc)	-0.00131	
Ln(LoanInc)	-0.00093618	
Ln(OtherInc)	-0.00087694	
R^2	0.4666	0.4624
R^2_{adj}	0.4586	0.4568

* Significant at 10% level | ** Significant at 5% level | *** Significant at 1% level

Table 3: Incumbent Vote Share Regression Results

United States House of Representatives elections, winning 63 former Democratic seats (Election Map, n.d.). These results suggest that on average, Republicans earned about 2% more votes than Democrats, controlling for funding. This finding is highly significant at the 1% level. In 2012, Democrats took back 8 seats from Republicans (Election 2012 House Map, n.d.). The negative coefficient for *IncR2012* supports the election results, and its lower significance reflects the smaller discrepancy between Democratic and Republican seats. For the 2014 election, the positive and highly significant coefficient for *IncR2014* confirms the election results, when Republicans won back 12 formerly Democratic seats (Election 2014 House Election Results, 2014). Finally, Democrats earned back 6 of their seats from the Republicans in the 2016 election (House Election Results: G.O.P. Keeps Control, 2017). Since this election did not radically change the party composition in the House of Representatives, the coefficient for *IncR2016* is the smallest and least significant of the four Republican binary variables. The results put forth by these variables suggests that candidates from the more popular party during their election year are more likely to be elected.

Several conclusions can be reached by comparing *Ln(TotInc)* and *Ln(TotChall)*. In Equation 1, the two have comparable coefficients, suggesting that the funding has the same effect for incumbents and challengers, alike. However, because the challenger's funding is more significant, its relationship with the incumbent's share of the vote is more reliable. Both variables are negative; thus, increasing total funding for the incumbent or the challenger lowers the percentage of the vote received by the incumbent. When challengers raise more funds, they prove themselves to be a more formidable opponent, and are more able to garner votes. On the other hand, incumbents only raise funds if a viable opponent who is capable of earning votes emerges. Equation 2 offers similar results, except that the incumbent's funding is more significant, which may be because the incumbent's funding now serves as a proxy for each of the source-specific

variables (such as *Ln(IndInc), Ln(CommInc),* etc.). Thus, raising more money is a good thing for the challenger and a bad thing for incumbents.

The majority of the source-specific coefficients are negative. As a challenger earns more funding, she earns more support, and incumbents are required to raise more money. The only exception to this rule is the challenger's own contributions. However, this variable is statistically and practically insignificant, meaning that a challenger's own contributions to her campaign do not improve her election prospects. *Ln(CommChall)* is highly significant at the 1% level and has the most negative value, meaning that challengers benefit most from funding from PACs. This may result because the challenger must already be strong competition in order to receive PAC support. Although *Ln(CommChall)* is statistically significant, it has such a small coefficient that lacks practical significance. On the other hand, incumbents benefit most from individual donations. Perhaps an incumbent's spending is most effective when it targets voters, specifically, to recall their memory of the candidate. However, these results are inconclusive, and do not have enough evidence to state with confidence that incumbent's individual contributions alter the election outcome. Therefore, the best way to earn votes is for incumbents to find individual donors, and for challengers to find PAC support.

Equations 1 and 2 satisfy most of the five ordinary least squares assumptions. In particular, both equations are linear in parameters. Because these models are not time series models, they do not suffer from autocorrelation. Neither model exhibits a variance inflation factor over 10, so no evidence for multicollinearity was detected. The residual plots were both slightly concave, suggesting that heteroskedasticity might be a problem. However, the coefficients remain unbiased, so it is suitable to explain and predict using these models. Finally, the error terms are approximately normal. By satisfying many of the model assumptions, the model produces reliable results.

Overall, the two models appear to explain the data reasonably well. Approximately 46% of the total variability in the share of votes earned by the incumbent is explained by these variables. Their highly significant F-values imply that the coefficients jointly contribute to the comprehensive fit of the model. Furthermore, there are no influential observations, as measured by Cook's Distance. Comparing the two models in their entirety is especially valuable in determining each model's effectiveness. Because each has similar coefficients and significances, the models are said to be robust. Lastly, because the adjusted R^2 does not substantially improve by including the incumbent's source-specific variables, they do not improve the explanatory power of the model. None of these variables are statistically significant, and thus do not convincingly affect the election results. Because Equation 1 and Equation 2 do not offer different conclusions, this study cannot show that simultaneity bias exists.

Margin of Victory

Table 4 presents the regression results for Equations 3 and 4. In these models, the coefficients for party influence are of predictable sign, but the significance has shifted. These results were rather surprising; the Republican advantage in the 2010 elections was expected to be to be the most significant, rather than in 2012. Furthermore, because *Ln(TotWin)* loses significance in Equation 3, as compared to Equation 4, it can be said that the total contributions to the winner's campaign do not significantly contribute to their election prospects. Instead, her individual donations and loans serve as a stronger predictor.

Once again, most of the source-specific variable coefficients are negative, meaning that as funding rises, the margin of victory declines, regardless of which candidate receives the funding. Therefore, candidates are only likely to raise funds if a formidable opponent exists. The result is a close race, where the margin of victory is small. According to Equations 3 and 4, there are a few

Equation	(3)	(4)
Intercept	1.11444	1.11983
WinR2010	0.01927 *	0.01413
WinR2012	-0.03520 ***	-0.03875 **
WinR2014	0.01109	0.0088
WinR2016	-0.02719 **	-0.02983 ***
WinInc	0.01934	0.03866 ***
Ln(TotWin)	0.00562	-0.02676 ***
Ln(TotLose)	-0.03498 ***	-0.03729 ***
Ln(IndLose)	-0.00149	-0.00147
Ln(CommLose)	-0.00521 ***	-0.00532 ***
Ln(CandLose)	0.00032569	0.00050658
Ln(LoanLose)	-0.00105	-0.00109
Ln(OtherLose)	0.00052706	0.0032752
Ln(IndWin)	-0.03234 ***	
Ln(CommWin)	-0.00042552	
Ln(CandWin)	-0.00212	
Ln(LoanWin)	-0.00213 *	
Ln(OtherWin)	-0.00149	
R^2	0.4636	0.4525
R^2_{adj}	0.4550	0.4464

* Significant at 10% level | ** Significant at 5% level | *** Significant at 1% level

Table 4: Margin of Victory Regression Results

exceptions to this rule: the loser's contributions to their own campaign, and other contributions to the loser's campaign. However, both of these coefficients are both practically and statistically insignificant; they both show a small coefficient with more than 10% significance. Therefore, this study cannot conclude with certainty that either truly affects the margin of victory.

The unique variable in Equations 3 and 4, *WinInc,* is positive in both cases, but changes significance. Its positive value signifies that incumbents do enjoy an incumbency advantage. In fact, the data suggest that incumbents earn a 1.9% margin over their challengers, on average, even after controlling for funding. On the other hand, because *WinInc* loses significance by including the source-specific variables, perhaps it is partially explaining the variance in source-specific variables instead. This would suggest that incumbents do enjoy an advantage in raising funds, but not in garnering votes.

We find similar significant variables when comparing Equations 1 and 2 with Equations 3 and 4. The results suggest that the loser benefits most from PAC contributions. Perhaps this is because committee support is difficult to generate, and if a candidate is successful in doing so, a close race is bound to occur. For the winners, individual contributions are the most beneficial. These results are significant at the 1% level. The only other significant source-specific variable is *Ln(LoanInc),* which is only significant at the 10% level, and has a relatively small impact on the margin of victory. More research is needed to investigate whether loans truly benefit campaigns. These results provide further evidence that donations from individuals and PACs is the most effective for earning votes.

The results from Equations 3 and 4 are more questionable than that from Equations 1 and 2, because they fail to satisfy the ordinary least squares assumptions. Although they are still linear in parameters and do not exhibit autocorrelation or multicollinearity, their residual plots suggest

that heteroskedasticity exists. Not only that, but the error terms are skewed right. Despite these issues, the coefficients remain unbiased, though their standard errors are likely incorrect. Thus, the results given by Equations 3 and 4 should be taken with caution.

As a whole, Equations 3 and 4 are suitable for explaining the differences in margin of victory between elections. Each of them captures about 45% of the total variance in margin of victory. Not only that, but their highly significant F-values signify that the variables as a whole contribute strongly to the model's fit. Once again, no influential observations were found, as measured by Cook's Distance. This implies that none of the elections impacted the results significantly more than the rest. By comparing Equation 3 with 4, this study finds that adding the winner's source-specific funding does not improve the model in any notable way. For the most part, coefficient signs and significances are unchanged, and very little is contributed to the R^2 value. These findings cast doubt on the simultaneity bias argument. If simultaneity bias did exist, then Equation 3 would have drastically different results than Equation 4. These results are quite robust, but not as robust as Equations 1 and 2, so Equations 1 and 2 offer more reliable evidence than Equations 3 and 4.

Conclusion

In the end, money does matter; it is a necessary, though admittedly insufficient, source of campaign strength. Using ordinary least squares regression, this study investigated how election prospects differ by candidate spending and partisanship. Candidates who belong to the more popular party during their election year are more likely to be elected. Furthermore, the more funding an incumbent receives, the smaller percentage of the vote she receives. The opposite is true for challengers. Therefore, the more a candidate spends, the smaller the margin of victory becomes, regardless of her incumbency status. This concept differs from the popular belief that

funding buys votes. This study adds to the literature by discussing how the impact of campaign finance on election outcomes depends on the source of funding. In fact, incumbents benefit most from individual contributions, while challengers gain the most from PAC contributions. Earning little funding practically guarantees a loss, but earning a lot may not win the election. Therefore, campaign finance reform is necessary to restore equality in electoral influence for all Americans, regardless of wealth.

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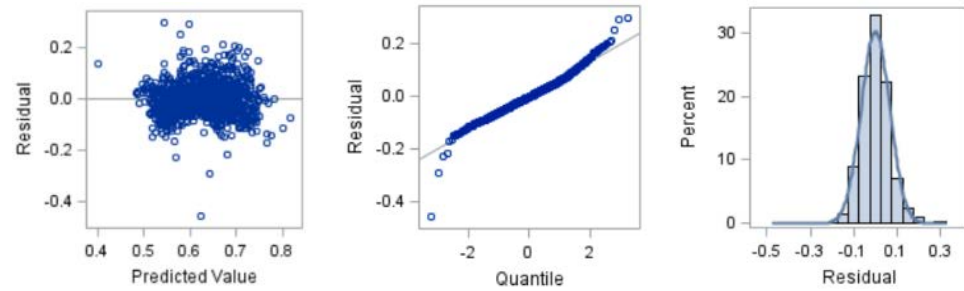The Center for Responsive Politics. (n.d.). What is a PAC? Retrieved from OpenSecrets.org:

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Appendices
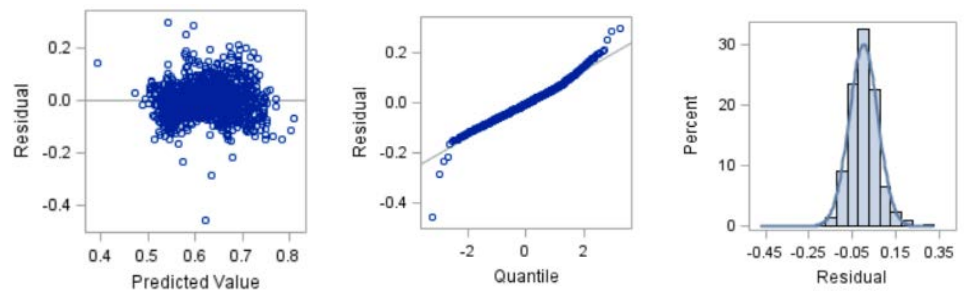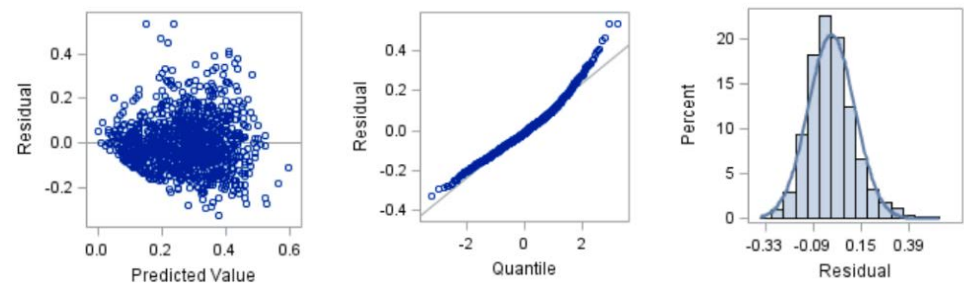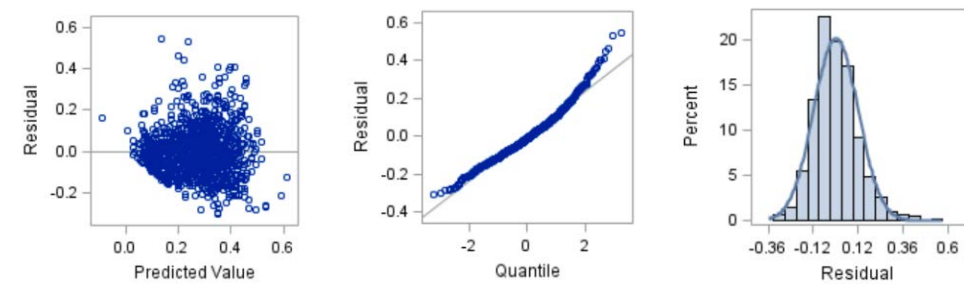
Appendix A: Residual Plots

Equation 1

Equation 2

Equation 3

Equation 4

Appendix B: Normality Plots