SSRG International Journal of Humanities and Social Science
ISSN: 2394-2703/ https://doi.org/10.14445/23942703/IJHSS-V9I4P110

Volume 9 Issue 4, 68-77, Jul-Aug 2022

Original Article

To What Extent is the Outcome of Competitive Congressional Elections Dependent on Campaign Spending?

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Received: 20 June 2022 Revised: 24 July 2022 Accepted: 02 August 2022 Published: 20 August 2022

Abstract *- There have been varying responses regarding whether campaign spending affects electoral outcomes. This paper focuses on competitive House elections in 2018 as identified by the Cook Political Report, leaving 104 districts. Multivariable regression was run, where the dependent variable was the margin of victory of each race. The independent variables were campaign expenditure, general political lean of the district, incumbency, income growth, education level, racial composition and population density. With an R-squared value of 64%, the independent variables did have a statistically significant effect on the margin of victory. The campaign expenditure, general political lean and education level were statistically significant in predicting the race's margin of victory, while the other variables were not. When focusing on the districts where Republicans were incumbents, the amount spent by the Democrats affected electoral outcomes, while the amount spent by the Republicans did not. When looking at open seats, the campaign spending seemed not to affect the margin of victory; however, this could be biased by the small sample size. Overall, this campaign spending matters the most for challengers in races where they are incumbents.*

Keywords – *Campaign spending, Elections, Politics, United States.*

1. Introduction

An often-researched question in political science regards whether or not campaign spending affects election outcomes. The answers vary; some suggest that spending affects elections (Gerber, 1998), while others disagree (Koerth, 2018). Much of the related research to this topic dates back to the 20th century, which is not always helpful as voters were less partisan in the 20th century compared to the present day. That is, we would expect voters to be less swayed by political advertising than in the past since more voters will just vote for the candidate of the party they align with.

Campaign spending is not the only variable said to affect elections, though. Incumbency weighs heavily in congressional elections (House and Senate). One paper found that candidates who closely won their elections had much larger advantages in subsequent elections. These candidates did not win by large margins, so it can be assumed that they were of the same quality as their opposing candidates. However, they had a higher chance of winning the next elections, showing that incumbency did help a candidate win. It was largely attributed to the incumbent's name recognition (Lee, 2001).

Another factor known to affect elections is the state of the economy. It is an important factor as a strong economy helps the incumbent while a weak economy hurts them. It has mainly been explored at the presidential level (Jackson, 1999). However, some studies have found that the President's party is held accountable for economic conditions across all levels of government, including congressional elections (Benedictis-Kessner and Warshaw, 2020).

The general political lean of the district also affects the outcome as the percentage of voters who split tickets has declined over time. In the 1960s and 1970s, it was common for voters to vote for the President of one party and a congressional member of the other party. It has gradually declined till the present, which means the winner of the congressional race is highly correlated with the winner of the district in the presidential election (Kimball, 2002). For instance, 16 congressional districts out of 435 in the 2020 election voted for a Republican for President and Democrat for House or vice versa (Todd et al., 2021).

This research paper investigates whether or not campaign spending affects election results. It focuses on the 2018 US House of Representatives elections, which were chosen as it was not a presidential year. Only competitive districts identified by the Cook Political Report were analysed as non-competitive districts that would likely vote one way or the other and, as such, might not be affected by campaign spending. Multivariable regression was run with the dependent variable as the margin of victory and the independent variables including campaign spending and other demographic variables. The demographic variables help act as controls to investigate whether campaign spending affected the electoral

outcome, as opposed to other factors. This analysis will also be conducted for races where Republicans were incumbents and neither party had an incumbent to see which spending matters in terms of incumbent vs challenger. The findings will add to the literature about whether campaign spending affects electoral outcomes with more recent data.

2. Materials and Methods

To investigate whether or not campaign expenditures affected election results, the paper will look at various factors that affected the results of the 2018 US House of Representative elections. The 2018 cycle was chosen as it was not a presidential year. A variety of factors to look at the extent to which the result was affected by campaign expenditures as opposed to other factors, which were control variables. The districts analysed were identified by the Cook Political Report in the lead up to the election as competitive, marked as Tilt, Lean or Likely as other districts were marked Safe and as such were highly likely to be won by the party it was marked safe for. It was to control for the possible influence gerrymandering might have had on reducing the number of competitive districts, as districts are often deliberately designed to be uncompetitive. It left 113 congressional districts. Districts from Pennsylvania were excluded as they had been redistricted in 2018 and did not have accurate values for several variables. It was difficult to determine incumbency, economic growth and Cook PVI for these districts, so they were removed from the analysis. It left 104 districts to analyse.

The dependent variable was the margin of victory expressed as the percentage of the vote received by the Democrat minus the percentage of the vote received by the Republican. The independent variables were:

- The percentage of the two-party spending by the Democrat, which is the spending by the Democrat divided by the amount spent by both the Democrat and the Republican. It ensured that districts where both sides spent more money, did not play into the regression. However, the difference in spending between them and the Republican and Democrat spending were used in other regressions.
- The Cook Partisan Voting Index measures the general political lean of the district. It compares the results of the past two presidential elections to the national average.
- Incumbency, indicated by +1 if the Democrat was an incumbent, 0 if it was an open race and -1 if the Republican was an incumbent
- Short-term income growth, which was the income of the congressional district in 2018 divided by that in 2017
- Medium-term income growth, which was the income of the district in 2018 divided by the income in 2010
- Education level, measured by the percentage of adults over the age of 25 with a 4-year bachelor's degree or higher
- The percentage of the district that was Non-Hispanic White
- The percentage of the district that was African-American
- The percentage of the district that was Hispanic
- The percentage of the district that was Asian
- Population density index, which was derived from the data Citylab used

Racial demographics were brought in as swings in one racial group could affect the margin of victory. Population density could matter if candidates outperformed in certain areas.

All this data was sourced from the FEC website, the US Census website, and Citylab's GitHub page. Multivariable regression was run with these variables. The regression was also run with a changed campaign spending variable for districts with Republican incumbents (73 districts) and open seats with no incumbents (25 districts). As pre-election polling showed that voters wanted Democrats to control congress, more Republican incumbents were vulnerable to losing their seats.

2.1. Null Hypothesis

Campaign finance does not affect the electoral outcome, measured by the margin of victory.

2.2. Alternate Hypothesis

The alternative hypothesis was that campaign finance affects the electoral outcome.

3. Results and Discussion

3.1. Results

The regression found that the nine independent variables predicted the margin of victory for the House candidates. The R-square value of 64% means that the variation in the independent variables can explain 64% of the variation in the margin of victory. The F significance value is less than 1%, which means that the variation is statistically significant and is unlikely to occur by chance.

Table 1. Summary Output for regression with all districts

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.801
R Square	0.641
Adjusted R Square	0.598
Standard Error	0.048
Observations	104

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	11	0.395	0.035	14.984	3.33E-16
Residual	92	0.220	0.002		
Total	103	0.616			

Of the nine variables, some had greater predictive value on the margin of victory than others. Democrat share of 2-party spending, Cook PVI and Education levels affected the margin of victory the most, with p-values less than 1%. The other variables: Short-term Income growth, Medium-term income growth, racial composition, and population density index, did not affect the margin of victory once the other variables were considered. It means the null hypothesis is rejected, and the alternative hypothesis is accepted, as campaign spending affects the electoral outcome.

Table 2. Descriptive statistics for regression with all districts

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	0.247	0.239	1.036	0.303
2-party spending by Democrat	0.157	0.036	4.328	0.000
Incumbent (+1 is Democrat, 0 is Open, -1 is Republican)	0.017	0.010	1.722	0.088
Cook PVI (positive is Democrat)	0.008	0.001	6.884	0.000
Short-term Income growth (since 2017)	-0.201	0.180	-1.118	0.267
Medium-term Income growth (since 2010)	0.037	0.064	0.577	0.565
% with a 4-year degree or higher	0.003	0.001	4.144	0.000
% Non-Hispanic White	-0.002	0.002	-1.559	0.122
% African-American	-0.003	0.002	-1.626	0.107
% Hispanic	-0.002	0.002	-1.544	0.126
% Asian	-0.002	0.002	-0.755	0.452
Population density index	0.000	0.014	0.003	0.998

It answers the research question, which is that campaign spending does affect electoral outcomes. For every additional percentage point of Democrat spending as a percentage of the total, the Democrat gains 0.16 percentage points in the race's margin. So, if the Democrats accounted for 60% of the 2-party spending, they would be expected to win by 1.6 more percentage points than if they accounted for 50% of 2-party spending. If they were losing, they would lose by 1.6 percentage points less than if they accounted for 50% of 2-party spending.

Another way to look at campaign spending is the difference in spending between the Democratic and Republican candidates. Keeping the other eight variables the same, we can run a regression.

Table 3. **Regression with campaign spending measured as the difference**

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.767
R Square	0.589
Adjusted R Square	0.539
Standard Error	0.052
Observations	104

ANOVA

	df	SS	MS	F	Significance F
Regression	11	0.363	0.033	11.970	1.327E-13
Residual	92	0.253	0.003		
Total	103	0.616			

We can see that the R-square value of 59% is lower than the previously seen 64%, suggesting that looking at campaign spending this way is less effective in determining the effect on the electoral outcome. The p-value for the campaign spending variable is 3.8%, which is larger than the p-value for the campaign spending in the previous value.

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	0.424	0.250	1.692	0.094
The difference in spending between Democrats and Republican	0.000	0.000	2.106	0.038
Incumbent (+1 is Democrat, 0 is Open, -1 is Republican)	0.031	0.009	3.267	0.002
Cook PVI (positive is Democrat)	0.008	0.001	6.764	0.000
Short-term Income growth (since 2017)	-0.248	0.192	-1.291	0.200
Medium-term Income growth (since 2010)	0.014	0.069	0.203	0.840
% with a 4-year degree or higher	0.003	0.001	3.518	0.001
% Non-Hispanic White	-0.002	0.002	-1.424	0.158
% African-American	-0.003	0.002	-1.652	0.102
% Hispanic	-0.002	0.002	-1.448	0.151
% Asian	-0.002	0.002	-0.690	0.492
Population density index	0.003	0.015	0.183	0.855

We see that incumbency is now a statistically significant factor affecting the margin of victory. If the Democrat is an incumbent, they have a 3.1 percentage point increased margin of victory if they were winning and a 3.1 percentage point reduced margin of loss if they were losing.

This method allows us to quantify how much a candidate gains by spending a certain amount. For every additional $1,000,000 spent by a candidate over their opponent, they would be expected to gain 0.53 percentage points in margin of victory.

The difference between this and the first model was that it depended upon the total 2-party spending, which relied on both the amount the Republican candidate spent and the amount the Democrat candidate spent. However, there was not a strong correlation between total 2-party spending and margin of victory (R^2 = 6.4%), making this a less helpful variable for determining margin of victory.

Focus shifted to districts Republicans were incumbents (n = 73) and districts with open seats (n = 25). The initial method to determine incumbency involved giving a -1, 0 or +1 value; however, this might have been limiting. There were six districts where Democrats were incumbents in the set; however, this was too small a sample size to determine anything meaningful.

When Republicans were incumbents, the R-square value was 64.7%, slightly higher than the overall regression. The variables deemed statistically significant (p < 5%) were 2-party spending, the general lean measured by Cook PVI and education levels, and the district's share with a 4-year bachelor's degree or higher. It is similar to the overall results.

Table 4. Regression with spending measured as share for Democrats where Republicans are incumbents

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.804
R Square	0.647
Adjusted R Square	0.590
Standard Error	0.045
Observations	73

ANOVA

	df	SS	MS	F	Significance F
Regression	10	0.234	0.023	11.366	9.38E-11
Residual	62	0.128	0.002		
Total	72	0.362			

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	0.177	0.290	0.610	0.544
2-party spending by Democrat	0.187	0.040	4.710	0.000
Cook PVI (positive is Democrat)	0.008	0.001	5.657	0.000
Short-term Income growth (since 2017)	-0.355	0.208	-1.704	0.093
Medium-term Income growth (since 2010)	0.098	0.077	1.271	0.209
% with a 4-year degree or higher	0.003	0.001	2.884	0.005
% Non-Hispanic White	-0.001	0.002	-0.535	0.595
% African-American	-0.001	0.002	-0.631	0.531
% Hispanic	-0.001	0.002	-0.573	0.569
% Asian	0.001	0.003	0.296	0.768
Population density index	0.005	0.014	0.333	0.740

However, another regression was conducted where the amount the Republicans and the Democrats spent were separate variables. 2-party spending was removed as it would be inappropriate to have a variable in a regression spawned from two others.

Table 5. Regression with spending separated by a party where Republicans are incumbents

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.816
R Square	0.665
Adjusted R Square	0.605
Standard Error	0.045
Observations	73

ANOVA

	df	SS	MS	F	Significance F
Regression	11	0.241	0.022	11.032	7.21E-11
Residual	61	0.121	0.002		
Total	72	0.362			

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	0.450	0.285	1.579	0.120
Amount spent by Republican	0.000	0.000	-1.446	0.153
Amount spent by Democrat	0.000	0.000	4.891	0.000
Cook PVI (positive is Democrat)	0.007	0.001	4.909	0.000
Short-term Income growth (since 2017)	-0.410	0.207	-1.982	0.052
Medium-term Income growth (since 2010)	0.083	0.075	1.107	0.273
% with a 4-year degree or higher	0.002	0.001	2.141	0.036
% Non-Hispanic White	-0.002	0.002	-1.178	0.243
% African-American	-0.002	0.002	-1.131	0.262
% Hispanic	-0.003	0.002	-1.287	0.203
% Asian	-0.001	0.003	-0.281	0.780
Population density index	0.007	0.014	0.484	0.630

The R-square is 66.5%, higher than for the previous model. In this case, we can see that the amount spent by Democrats, Cook PVI, and education levels as measured by the percent of residents with at least a Bachelor's degree are the statistically significant variables. The amount spent by the Republicans was not an important variable in determining the margin of victory. It is in line with research that suggests the amount the challenger spends

matters more than how much the incumbent spends, as the Democrats are challengers here (Jacobsen, 1990).

When looking at open seats, there is a smaller sample size of 25, making it harder to draw clear conclusions. Two regressions were run: one with Democrat share of 2-party spending to measure campaign expenditure and another with Republican spending and Democrat spending. These were independent variables. The R-squared value was higher for the latter (R^2 = 75.9%) than the former (R^2 = 70.2%), so it will be shown here.

Table 6. Regression with open seats

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.871
R Square	0.759
Adjusted R Square	0.556
Standard Error	0.053
Observations	25

ANOVA

	df	SS	MS	F	Significance F
Regression	11	0.115	0.010	3.732	0.014
Residual	13	0.037	0.003		
Total	24	0.152			

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	1.203	0.715	1.683	0.116
Amount spent by Republican	0.000	0.000	-2.112	0.055
Amount spent by Democrat	0.000	0.000	-1.441	0.173
Cook PVI (positive is Democrat)	0.007	0.003	2.519	0.026
Short-term Income growth (since 2017)	0.237	0.503	0.470	0.646
Medium-term Income growth (since 2010)	-0.018	0.181	-0.102	0.920
% with a 4-year degree or higher	0.006	0.002	3.261	0.006
% Non-Hispanic White	-0.015	0.008	-1.825	0.091
% African-American	-0.018	0.008	-2.159	0.050
% Hispanic	-0.014	0.008	-1.757	0.102
% Asian	-0.012	0.008	-1.616	0.130
Population density index	-0.051	0.044	-1.159	0.267

Cook PVI and Education levels have a statistically significant effect on the margin of victory, as expected. Interestingly, campaign spending does not affect the margin of victory – which also held when looking at Democrat share of 2-party spending – for these districts. Some of this might be attributed to the small sample size.

The share of African-Americans was shown to be near – statistically significant as a factor in predicting the margin of victory when looking at the 25 open seats. This correlation was negative: the more African-Americans in the district, the more Republican it was likely to be.

However, the p-value was 5.0%, so it wasn't a strong correlation. It is likely explained by region. Democrats won 12 of these 25 seats, of which only 3 (25%) were in the South. Republicans won 13 of these 25 seats, of which 8 (62%) were in the South. This difference in proportions is significant at the 5% level. These variables correlated as African-Americans are more concentrated in the South, and Republicans did well in this region.

3.2. Discussion

The variables that affect electoral outcomes are Cook PVI, the share of 2-party spending, Education levels and sometimes incumbency.

The campaign spending mattered in many cases, but not all. Campaign expenditure was measured in three ways: the share of 2-party spending by the Democrats, the difference in spending between the Democrats and Republicans and the spending by the Republicans and the Democrats (two separate variables). It was a statistically significant variable during the regression involving all the congressional races studied. However, different results emerged when broken up into two categories.

In elections where Republicans were incumbents, the amount the Republicans spent did not help determine the margin of victory; however, the amount the Democrats spent was statistically significant. It is in line with research that says the amount spent by the challenger, in this case, the Democrat, is more important than the amount spent by the incumbent. This is because the challenger is not as well-known as the incumbent, so challengers spending more will allow them to gain name recognition and help voters understand their policy positions, making them more popular. Incumbents are already well-known, so spending more will not affect their margin of victory (Jacobsen, 1990). Another reason is related to raising, as challengers more likely to win are likely to raise more money, leading to them spending more (Jacobson, 2006).

We should be mindful of drawing too much from a set of 25 races in open races. It has been said that campaign spending affects election outcomes for open seats but more for Republicans than Democrats (Jacobson, 2006). Our results agree with this as the p-value for Republicans was 5.5%, which is close to the alpha of 5%, while for the Democrats, this was higher, suggesting it helped the Republicans more than it did Democrats. However, this is not a statistically significant effect, so it would be better for a future study to look at larger sample size, drawing from multiple years.

The Cook PVI was an important factor, as expected. It uses presidential election results from 2012 and 2016 for this model. A district's votes in presidential elections are highly correlated with how it votes in house elections, as few vote for different parties for President and Congress. In the 2020 election, 95% of those who voted for a Democrat for the US House voted for Joe Biden (the Democrat), while 4% voted for Donald Trump (the Republican). Similarly, 95% of those who voted for a Republican for the House voted for Trump, with 4% voting for Biden ("National Results 2020 President Exit Polls", 2020). Even though we restricted the districts to those with competitive races, some districts had a Republican lean, and others had a Democrat lean, which would influence the margin of victory in the respective direction.

The education level, measured by the share of residents with a 4-year bachelor's degree or higher, also affected the margin of victory. It can be attributed to Trump's unpopularity with college-educated voters. According to Pew research, there wasn't much difference between college graduates and non-college graduates in voting in 2012, but this shot up as Trump became more popular with non-college-educated voters and less popular with college-educated voters (Tyson and Maniam, 2016). These trends were apparent in the lead-up to the 2016 election. Before the election, many assumed that Clinton, Trump's opponent, would make up for the losses among non-college-educated whites with gains among college-educated whites (Cohn, 2016). That did not happen; however, college-educated voters swung toward the Democrats. This trend continued into 2018, leading to more college-educated voters disliking Trump and voting against Republicans (Chinni, 2021).

Incumbency was a variable that mattered in one of the models. In this model, the difference in spending between the Democratic candidate and the Republican candidate was looked for. When spending was more strongly accounted for, with a share of 2-party spending by the Democrats, the effect of incumbency on the margin of victory was negligible. This suggests that there is a relationship between incumbency and spending.

For instance, the total spending by both parties when Democrats were incumbents was lower than in open seats or when Republicans were incumbents. It is because the generic congressional ballot, or whether voters wanted Democrats or Republicans to control congress, was leaning toward Democrats by 8 percentage points, according to pre-election polling ("Generic Ballot: 2018", 2018). This was by more than 2016. Democrats who were incumbents had already won in the previous election. As the national environment shifted further in their direction, their races became less competitive, so less was spent. Many of these had also become uncompetitive, as the set of competitive districts only included 6 where Democrats were incumbents.

Between races where Republicans were incumbents and races where neither was an incumbent (open seats), total spending was similar; however, spending leaned 2:1 towards Democrats when the seats were open while it was evenly spent where the Republicans were incumbents. The relationship will have to be investigated with more complex models.

Short-term economic growth had a p-value of 5.2% when Republicans were incumbents. It is close to 5%, the cut-off at which we determine statistical significance. While it did not clear the threshold, it was close enough to comment. It was a negative correlation, meaning more economic growth led to a greater margin in favour of the Republican, who was the incumbent. It means incumbents are rewarded for economic growth and punished for economic decline in the district. All these values were at the local level, so they specifically referred to conditions in the district. These values are limited, however, as the income growth in many districts was not greater than the margin of error in the Census data. Studies have found that the national economy affects the President's party, whereas a weak national economy hurts the presidential party's house candidates (Benedictis-Kessner and Warshaw, 2020). Little emphasis has been placed on the local economy; however, so further studies will have to investigate this more closely.

3.3. Limitations

This dataset only includes the 2018 US House of Representative Elections and is focused on competitive races. It is one year, and other years could later be included. The study can be conducted on a larger sample of districts to bring a generalised conclusion. These could be done by including less competitive districts or looking at multiple years' data. Districts were also included that were competitive before the election, which is limited as campaign spending could have affected districts that may have been previously competitive but are no longer competitive.

Other limitations include that only overall campaign spending could be included as a variable instead of the amount spent on advertising. Studies have found the amount spent on advertising affects electoral outcomes more than spending on other items (Schuster, 2020).

Because of time and resource constraints, certain variables, such as the previous margin of victory for the incumbent, and the incumbent's voting record, could not be brought in. These have been found to affect electoral outcomes (Silver, 2022). Future studies can include these variables.

It was difficult to account for incumbency in the model, as open seats are not necessarily halfway between a Republican incumbent and a Democratic incumbent. This simplifying assumption needed to be made as it was not the paper's focus.

4. Conclusion

Campaign spending is a statistically significant variable in determining election outcomes. The share of the 2-party spending by the Democrats had a statistically significant effect on the margin of victory using multivariable regression. Other variables that affected the margin of victory were the general partisan lean of the district and the education levels, measured by the share of voters that had a bachelor's degree or higher. It held among all the regressions tried. Incumbency was a factor when campaign spending was accounted for using a weaker measure, the difference in spending between the Republicans and Democrats.

When looking at districts where Republicans were incumbents, the amount spent by the Democrats was statistically significant to determine the margin of victory. In contrast, the amount spent by the Republicans was not as important. It is in line with research that says the amount spent by the challenger is more important in races where there is an incumbent. When looking at open seats, spending did not affect the electoral outcome. However, this could be affected by small sample sizes.

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