Abstract

To what extent does campaign spending affect Congressional elections? Many scholars have found that spending is an important indicator of elector success, but has the relationship changed since the Supreme Court ruling of Citizens United? This paper tests two different models that measure money's influence on vote totals; A more traditional model that uses challenger and incumbent spending, and a new model I invented that looks at relative spending difference. Results indicate that campaign spending is incredibly important for challengers to “buy” votes, but doesn’t appear to be crucial for incumbents. Difference in spending was also highly significant, but regressions using that measure had less explanatory power than the more traditional model. Ultimately, campaign spending is a significant indicator of vote shares, but many different factors determine election outcomes.
Introduction

Over the last fifty years, followers of U.S. politics have been fascinated by the role of money in elections. Since the recent Supreme Court decisions of Citizens United v FEC and SpeechNow.org v FEC, outside spending has increased steadily (see Figure 1). Although total Political Action Committee (PAC) spending in 2008 was about $600 million, this number more than doubled to $1.3 billion in 2012, the first presidential election following Citizens United (Krumholz, 2013, 1119). The staggering increase of campaign spending begs the question, how effective has this money been in affecting elections? While campaign expenditures intuitively must play some role in election outcomes, as campaigns cannot run on energy alone, there is conflicting academic debate about the scope of money’s power.

This question is important because if money does have a significant effect on election results, it raises concerns about the health of democracy in the U.S. There is already data that suggests elected officials are more responsive to the policy preferences of the top 10 percent of incomes, than the preferences of everyone else (Gilens, 2012). This difference in responsiveness is worrisome when coupled with high levels of inequality. Currently, the top 10 percent income bracket owns roughly 80 percent of the wealth in the U.S. (Fisher and Smeeding 2016). For these reasons and others, politicians such as Bernie Sanders worry that the government has drifted towards oligarchy, in which the wealthiest citizens can buy elections and control the political process. As a result, if campaign spending does have a dramatic effect on elections, there is legitimate concern about who politicians truly answer to, large donors or working class Americans.
I hypothesize that campaign spending does play a large, if not deterministic role, in elections since the *Citizens United* ruling. More specifically, money spent by challengers should be more effective at getting votes than money spent by incumbents. Incumbents possess many advantages challengers do not; therefore spending should be more critical for challengers who need to become known to voters. If challengers do benefit more from campaign spending, and a good deal of evidence suggests this is the case (Abramowitz 1991, Jacobson; 1978, 1980, 1985, 1990), there are critical implications for crafting effective campaign finance reform. However, few previous studies approach campaign-spending effects by examining which candidate outspends the other. As a result, I seek to expand on the previous research by creating a model based on differences in spending levels. I assert that candidates who can outspend their opponents should be more likely to win by having this relative spending advantage.

I will first discuss previous attempts to measure campaign spending effects, the challenger versus incumbent divide, and justification for my model’s innovation. That will be followed by a brief history of campaign finance laws and other Supreme Court rulings that have shaped the current campaign finance landscape. I will also discuss the structure and function of independent expenditure groups such as political action committees (PACs) and the recently created Super PACs. I will then present the methodology, data, and models used in my study. Afterwards, I will share the results and implications of my statistical analysis. Lastly, the conclusion will examine potential legislative responses to regulate the amount of money in elections.
Literature Review

Most scholars in the field agree that money matters in elections (Abramowitz 1991, Erikson and Palfrey 2000, Gerber 1998, Green and Krasno 1988, Jacobson 1980, Silberman and Yochum 1978). However, the issues of who benefits the most from campaign spending, incumbents or challengers, and how to measure this effect are widely contested. The majority of House races feature an incumbent trying to preserve their seat against a challenger. As a result, many studies have tried to explain the campaign spending effect by using models with separate variables for challenger and incumbent spending. Some races may be open (when there is no incumbent), or feature multiple challengers, but these are much more rare than the standard incumbent versus challenger dynamic. Even after decades of research, there are no conclusive results about who benefits more from campaign expenditures. Finding out if campaign spending helps challengers more than incumbents is important because it could guide the approach of future campaign finance policy.

Academics have argued that there should be different effects of campaign spending on vote shares because incumbents have many significant advantages that challengers do not. First, by virtue of having won a previous election and all the campaigning that comes with it, incumbents are already fairly well known to their voters. Challengers often lack the same level of name recognition in the districts they are running to represent. This discrepancy matters because voters tend to strongly prefer candidates whose names they remember (Stokes and Miller 1966;
Jacobson 2004). As a result, challengers have to spend significantly to get their brand out to American voters.

Incumbents also benefit from the free mailing list every member of Congress has access to, called franking. While challengers must pay to send campaign material out to voters, incumbents use the franking system to communicate with constituents at no cost. This enables members of Congress to relay recent accomplishments to their constituents, whereas challengers have to create literature that explains their strengths as a candidate. In politics, it’s all about what have you done for a constituency recently, and use of the franking system enables incumbents to communicate these achievements in a manner that challengers cannot match.

Although name recognition and franking privileges are useful for incumbents, they are both small advantages compared to the network of donors and access to money that members of Congress possess. Because incumbents have run for office before, the infrastructure of consistent donors has already been built. Also, unless a race is especially close, large donors are far more likely to give to incumbents. This makes sense given that generally ninety-five percent of House members win reelection every cycle (Busch, Ceaser and Pitney 2013). If donations are made with the hope of gaining influence, it’s not surprising that the money is going to candidates who have the best chance of winning. Very little political influence comes from donating to the loser of a Congressional campaign. Additionally, incumbents have benefitted far more from the increase in PAC money than challengers (Heberlig and Larson 2014). As a result, challengers face a very
difficult task in trying to unseat an incumbent. With these advantages in mind, some scholars have argued that money is more important for challengers than incumbents and has a larger effect on “buying” a bigger percent of the vote share (Jacobson 1978, 1980, 1985, 1990, Abramowitz 1991).

In fact, Jacobson finds that higher incumbent spending causes smaller vote shares. Intuitively this makes little sense, as spending money shouldn’t have a negative impact on vote totals. We might expect incumbent spending to be less effective than challenger spending, but not a negative relationship. Jacobson asserts this finding makes sense, as incumbents only spend large amounts of money when they are in electoral danger. Consequently, the more likely a loss becomes, the more an incumbent will spend in an attempt rescue their seat. However, others have found that incumbent spending is a significant predictor of vote share (Erikson and Palfrey 2000), and in some cases just as significant as challenger spending (Green and Krasno; 1988, 1990).

Questions about possible endogeneity have led to this host of different findings on campaign spending effects. Green and Krasno claim that expectations about the election influence the amount of money spent in each campaign. That is to say, if a challenger is expected to do well in the election, it will be easier for them to raise a lot of money. Therefore, it is hard to know if a candidate’s vote share is determined by the amount of money spent or as a result of their perceived strengths as a politician. To address this problem, Abramowitz (1991) tried to control for expectations, and thus the question about direction of causality, by using pre-election forecasts. He argues, “This approach is more logical since the real problem
here is not reciprocal causality, election outcomes cannot affect campaign spending, but the potential bias introduced by elite expectations” (Abramowitz 1991, 45).

In addition to the diversity of campaign-spending spending effects, there have been many different methodologies used to approach this problem. Jacobson and Abramowitz employed a standard multivariate linear regression. Alternatively, Green and Krasno use an instrumental model with a two-stage least square regression. They argue that expenditures from the previous campaign should explain the new spending levels, without affecting the variation of vote share in the new election. This justification is similar to Abramowitz’s control for expectations, but is measured to control for.

However, their model differs from other studies in another important way. They argue that campaign spending doesn't have a linear effect on vote share, and therefore using an OLS model is inappropriate because it inflates the importance of challenger spending. The logic behind this claim is that different levels of campaign expenditures should affect vote shares in different ways. Money would have little effect until it reached a point where the candidate could be competitive. That is to say, a challenger’s first 1 million dollars might not affect “buy” a lot of votes because they are being heavily outspent. Once they manage to make the race competitive, money would significantly influence vote shares in this “competitive” bracket. And finally spending should start to deliver diminishing returns as more voters make up their minds, and the ad markets become highly saturated. As a result of this optimization curve, Green and Krasno argue that money affects vote shares in different ways depending on the level of spending.
A later study that employs a game theory model on campaign spending supports this claim (Erikson and Palfrey 2000). For races expected to be close, both incumbent and challenger spending had a significant linear effect on vote share. However, in races that weren't predicted to be close, where the incumbent was expected to get 60 percent or more of the vote, spending for incumbents wasn't significant and challenger spending, while significant, did not have a linear effect on vote shares. Erikson and Palfrey argue that in close races, campaigns will continue spend more money as they see their opponent spend more money, effectively engaging in a war of attrition. Not only does looking at races expected to be close allow us to measure the linear effect of spending on vote share, it highlights elections that are the most politically important in which money is the most critical. The implications of these findings are of great importance to politicians and scholars alike.

Ultimately, there doesn’t appear to be a silver bullet for measuring the effects of campaign spending on Congressional elections. While Erikson and Palfrey’s game theory model has important implications, its application is limited to races expected to be close, where the effect of money should be linear. For races that are perceived to be safe for incumbents, and that is certainly the majority, findings are inconclusive, but suggest a more hyperbolic or non-linear relationship. One could ask if in districts where close races aren't possible, due to gerrymandering or sorting of voters, does money even matter at all? Given the wide range of methodologies and findings, it is hard to tell. Although challenger spending is
consistently significant, it is still unrealistic for a Democrat to win in a rural Arkansas district regardless of how much money they have.

Considering the political importance of close races, I believe Erikson and Palfrey's findings are the most significant in discussing the effect of money in elections, so I incorporate their method into my model. All of the research mentioned so far measured campaign spending with a variable for challenger spending and a different one for incumbent spending. In keeping with this tradition, I construct the first model to test if the same campaign spending effects found before *Citizens United* apply today.

Previous studies neglected a different and more intuitive way of approaching campaign effects on elections. While incumbent and challenger spending are clearly important, I believe that using the *difference* in spending between the two candidates as a percentage is a better measure than the individual amounts. There are a number of factors that support this claim. First, measuring campaign expenditures by looking at relative spending between two candidates better controls for the variance in cost of different House races. For example, a House race in Cleveland should be far more expensive than a close race in Idaho because buying time to air ads costs more in urban areas. As a result, the relative percent difference in spending between two candidates factors in different media markets better than previous spending models.

Analyzing the difference in spending is also useful because relative spending reflects the reality of campaign dynamics. Elections are not run in a vacuum where a candidate is looking to raise a specific amount of money, they are about outspending
their opponent. Doing so leads to more advertisements and having a better ability to control the campaign narrative. Furthermore, having the extra money to spend on a strong ground game is critical. While most campaign funds go to airtime and ads, the most critical aspect of any campaign is the ability to mobilize voters and volunteers. A charismatic candidate might be able to generate a lot of energy, but without the money to fund a strong ground game, candidates will have a hard time getting reelected. Lastly, being within striking distance of the opposing candidate, both in fundraising and in the polls, can be a determining factor in attracting more donations. If an incumbent is overwhelming the challenger, the party committees and other wealthy contributors might decide to pull funding for the challenger because the race seems like a lost cause. The opposite is also true, that competitive challengers sticking around are likely to attract more money. Therefore, relative spending is an important barometer for electoral success because it captures the likelihood that money, and thereby potential votes, will continue to flow into the campaign’s coffers.

As mentioned earlier, most studies have found challenger spending to be more important than incumbent spending. If this is truly the case, a campaign-spending variable that measures if and how much the challenger outspends the incumbent should be incredibly valuable. Any candidate that outspends an incumbent has a much better chance of winning than most challengers. Generally speaking, House incumbents win ninety-five percent of their reelection campaigns. Although many of these races are in non-competitive districts, some are races where the challenger simply can’t match the incumbent’s ability to fund raise. Although
being heavily outspent doesn’t mean winning is impossible, as Paul Wellstone showed with his surprise win in the Minnesota Senate campaign of 1990. If a challenger does outspend the incumbent, it signals that the race is at least going to be highly competitive, if not in favor of the challenger. Furthermore, the magnitude of spending difference variable would be very informative. If outspending an incumbent by 20 percent leads to an incredibly high “vote-buying” effect for challengers, campaigns would have access to a useful benchmark.

**The Study**

Based on the previous literature, my main hypothesis is that challenger spending should be more significant in “buying” votes than incumbent spending.

(H₁): *Challenger spending should have a significant effect on vote share, and a greater effect than that of incumbent spending.*

In this base model, the independent variables are total challenger spending and incumbent spending. Given the literature, I expect incumbent spending to be significant but have a smaller effect on vote shares than challenger spending. To test this hypothesis, I created a hybrid model using different components of previous academic studies. I first use Abramowitz’s method of CQ Weekly pre-election classifications to gauge political expectations and control for endogeneity of campaign spending effects. I then use Erikson and Palfrey’s qualification of exclusively competitive elections, such that an OLS regression is appropriate. By
looking at races predicted to be close, spending should be relatively even and thus maintain a linear effect on vote shares.

I also include a few model alterations that improve the overall fit of the specifications. The first is a control for the wave election of 2010. The court rulings on independent money created institutional changes in campaign dynamics and the Tea Party emerged as a potent political force. Across the country millions of Americans mobilized against President Obama and his agenda. This political uprising coupled with more money than expected in mid-term elections, lead to an enormous wave election with Republicans picking up sixty-three seats, the biggest swing since 1948 (CNN, 2010). Given these dynamics and the unusually large House gain for Republicans, I present a second hypothesis using the same basic model from $H_1$ that controls for the wave election.

(H$_2$): *Challenger spending should be significant and have a larger effect on vote share than incumbent spending after including a control variable for the 2010 wave election.*

If the wave election variable is highly significant, it means the 2010 cycle is a special case and therefore clouds the findings of the campaign spending effect in $H_1$. Finding support for this hypothesis would also suggest that in wave elections, the normal effects of campaign spending on vote share don't seem to apply.
The models also include some different interaction terms. Interaction terms are worth adding if the relationship between two variables changes as the dependent variable varies. For example, some studies have found that campaign spending affects vote shares differently based on which party is doing the spending (Silberman and Yochum 1978). Although there are a few variables in this model that intuitively could merit an interaction term, I believe there are two interactions especially that deserve their own model.

One such relationship is that of challenger quality and challenger spending. If only a percentage of challengers are expected to compete with incumbents, and thus receive enough money to wage a competitive campaign, we need a measure of challenger quality, as not all challengers are created equal. Green and Krasno use an 8-point scale where holding an elected office, having personal wealth, or celebrity status are all factors that should make a challenger more competitive (Green and Krasno 1988, 888). It makes sense that a more skilled or qualified challenger should have an easier time raising money given their high electoral prospects. To test this assumption I create an additional hypothesis with this interaction effect.

\[ H_3: \text{Challenger spending should be significant and have a larger effect on vote share than incumbent spending, and the effect of challenger spending on vote share should vary according to the challenger's strength.} \]

Another potential interaction effect regards district partisanship with the incumbent’s party. If Democrats have a higher chance of winning in a more liberal
district, the effect of campaign spending should change based on how partisan the district is. Intuitively this interaction makes sense because Democrats do have more success in liberal districts, as Republicans do in more conservative ones.

\((H_4)\): Challenger spending should be significant and have a larger effect on vote share than incumbent spending, and the effect of incumbent party and district partisanship interact in their effect on vote share.

For this hypothesis to be supported, the interaction term would have to be significant. If that is the case, the party of the incumbent, and implicitly of the challenger, affect vote share differently given the partisan makeup for the district. Mean district partisanship was subtracted from each case and then multiplied by 1 if a Democrat was running and 0 if a Republican to create this interaction variable.

My first four hypotheses are constructed with separate variables for challenger and incumbent spending as is consistent with the literature. For simplicity, these four models test that use separate variables for challenger and incumbent spending. I refer to these as models as group A.

I now present three additional models that measure campaign spending by looking at the difference between incumbent and challenger spending as a function of incumbent spending.

\((H_5)\): The larger the ratio of incumbent spending to challenger spending, the higher the vote share for the incumbent. This also claims the inverse is true. The
smaller and more negative the ratio, the higher the vote share a challenger should receive.

For this hypothesis to be supported, I would need the coefficient for difference in campaign spending to be positive and statistically significant. If these criteria are met, it would mean the more an incumbent outspends their opponent, the more votes they get. The same logic would be true for the relationship between challengers outspending incumbents and getting a larger share of the vote. This hypothesis is not claiming that whoever outspends their opponent will win, as there are other factors involved in elections. Simply that the percent of the vote a candidate gets is affected by the amount of money they spend relative to their opponent.

I put forward two additional models that borrow the same logic from H3 and H4 but use the difference in campaign spending measure instead of the challenger and incumbent spending.

(H6): The larger the ratio of incumbent spending to challenger spending, the higher the vote share for the incumbent after including a control variable for the 2010 wave election.

For this hypothesis to be supported the wave election variable would have to be significant and the model would have to explain more variation (larger R-squared) than H5.
(H\textsubscript{7}): The larger the ratio of incumbent spending to challenger spending, the higher the vote share for the incumbent after including an interaction between district partisanship and incumbent party.

For this hypothesis to be supported, we would need to see similar criteria expected for H\textsubscript{6}. The interaction variable would have to be significant and explain more variance than H\textsubscript{5}. The 2010 wave election control variable is also included in the H\textsubscript{7} model. I didn't include a model that used an interaction between challenger quality and campaign spending difference because challenger quality shouldn't affect the ability for an incumbent to raise money. One could argue that a strong challenger might lure away large donors from incumbents, but I don't find this argument to be convincing given incumbent advantages and a wide array of large donors.

To summarize, I expect challenger spending to be significant and more influential in gaining votes than incumbent spending in model group A. I also expect the larger the difference in money spent, the higher the percent of votes received by the candidate who outspent their opponent in model group B. Next, I expect that my measure of campaign spending, as the percent difference between incumbent and challenger spending, will be a more robust measure at capturing campaign spending effects than the separate campaign spending models. Finally, I conduct regressions that include a wave election variable or an interaction term should be more accurate and have higher R-squared values than the other models.
The model also includes a few control variables that should affect House elections. First, a district’s partisanship is a critical barometer for predicting how well challengers can expect to perform. A Democrat running in a rural Alabama district is not going to have the same chances as one running in downtown New York. Therefore, I would expect districts that have a more liberal makeup, to be more favorable to Democratic Congressional candidates. Building off this, the party of the incumbent is also an important indicator of how the race may turn out. The logic of including candidate party is the same as for including district partisanship. In certain parts of the country, a D or an R can be a huge advantage.

I include a control for length of time served in office. The longer a member of Congress has served, the better known they should be in the district, and the stronger their campaign infrastructure. Furthermore, a member of Congress who has served for around 10 years is likely to have some type of committee chairmanship. Often, these committees will in some way reflect the interests of their constituents (Abramowitz 1991, 36). As a result, these representatives will have frequent publicity on issues their voters care about. This is yet another advantage many incumbents enjoy over challengers.

Lastly, I include the measure for challenger strength based on Green and Krasno’s 1988 model mentioned earlier. It is worth noting that this measure is not perfect. In the current political era, holding previous office may in some instances be seen as a weakness, not an advantage because of negative attitudes towards Congress. This feeling would likely affect incumbents more than challengers, as challengers often say they will be elected to change Congress, while incumbents can
make no such claim. Overall, Green and Krasno’s measure of challenger strength seems to be the most comprehensive, and will thus create the best indication of whether or not challenger quality affects the vote shares.

**Background on Campaign Finance Regulation**

The relationship between campaign spending and regulation has been consistent throughout the last century. Citizens and politicians concerned about campaign expenditure amounts or donation transparency have crafted laws to address systemic problems. Following these adjustments, campaign donors have looked for loopholes and new ways to circumvent regulations in order to exert political influence. Recent campaign finance laws have been no different.

The Federal Election Campaign Act (FECA), enacted in 1971, was the first piece of effective modern campaign finance legislation. FECA forced contributors and recipients alike to publicly disclose their campaign expenditures, limit how much one individual or group could donate, and cap how much the parties or candidates could spend (Garrett, 2014, 98). FECA also established the Federal Election Commission to, among other things, monitor money in elections. FECA remained effective until loopholes began to pop up. Large donors started spending on negative ads and “party-building activities,” that legally weren’t considered political, and therefore weren’t subject to FECA restrictions, but still had a noteworthy impact on elections (Garrett 2014, 90).

The increase of soft money prompted Congress to pass The Bipartisan Campaign Reform Act (BCRA) in 2002. The bill made it illegal for national parties to raise soft money in federal elections. The bill also prevented corporations from
airing ads about federal officials 30 days before a primary election, and 60 days before a general election. Following the Jack Abramoff corruption scandal, BCRA was amended to include more significant disclosure of lobbying contributions and thus increase transparency. BCRA significantly limited the ability for corporations and large contributors to influence federal elections as it closed avenues for soft money. BCRA and FECA were created because politicians and citizens alike viewed unregulated campaign spending as dangerous to the political process.

Following BCRA, campaign finance has been adjusted almost exclusively through the courts. Recent Supreme Court decisions have enabled organizations and contributors to donate unlimited amounts of money with relatively little transparency. Although *Citizens United* is better known, the first real blow dealt to BCRA came in 2007 from *FEC v Wisconsin Right to Life*. The Supreme Court found that corporations and unions could run advertisements as long as those ads didn’t explicitly encourage people to vote for or against a specific candidate (Gerken, 2014, 907). This ruling set an important precedent that ‘independent’ money itself shouldn’t be limited, given the absence of explicit instruction on how to vote.

*FEC v Citizens United* in 2010 merely changed the acceptable language standards of independent political ads. Following the ruling, corporations could run ads that explicitly told voters who to vote for. Groups were also now allowed to run ads in the pre-election time frames as along as they didn’t explicitly tell someone to vote a certain way. A few months later, the court ruled in *SpeechNow.org v FEC* that donations to groups that only pay for independent expenditures but that do not contribute to campaigns (PACs) couldn’t be limited.
Lastly, in the case *McCutcheon v FEC*, the Court struck down the aggregate spending limits imposed by FECA, which were added following Watergate. Before this ruling in 2014, individual contributors and corporations couldn’t donate more than $117,000 per election cycle. This case is the final ruling in a series of decisions that crippled both FECA and BRCA, and limited the government’s ability to regulate elections. These court decisions are important because they enabled unlimited campaign spending, which has fundamentally changed the nature of campaigning. Politicians who previously felt electorally safe are now fearful of being outspent in a general election or being challenged in a primary by a surprisingly well-funded opponent.

The ruling of *SpeechNow* enabled the creation of Super PACs, groups that can accept unlimited funds as long as they don’t donate that money to campaigns or “coordinate” with politicians. The result was an overnight transformation in the nature of campaign spending (Mayer 2016). Super PACs with no spending limits could participate in significant political activity, as long as they didn’t get sloppy with coordination restrictions. Because the rulings prevented Super PACs from acting in concert with campaigns, most Super PAC money went to funding negative advertisements against their opponents. Democrats found this out the hard way in 2010 when politicians at the local, state and federal level faced unprecedented waves of attack ads and negative mail campaigns. As figure 1 shows, outside spending (not contributions donated to a specific candidate) almost matched the 2008 level, a surprising finding given that spending in mid-term elections is usually far smaller than in presidential cycles. This influx of unrestricted outside money
helped fuel the Republican wave election in 2010 and showed that Super PACs had dramatically altered the campaign landscape (Mayer 2016).

Furthermore, this increase in spending also came without creating appropriate transparency measures. Technically, donations to Super PACs are disclosed with the FEC. However, Super PACs can accept unlimited contributions from political non-profits and shell corporations who may not have disclosed their donors (OpenSecrets.org, 2012). Many donors have used 501(c)s to circumvent these campaign spending disclosure laws. These organizations are legally tax-deductible charitable groups and thus aren’t obligated to reveal their donors. So, a wealthy individual could donate a million dollars to a “charitable organization” and then that organization could donate those million dollars to a Super PAC without the money being traced to the original source.

Another way large donors can avoid transparency is by timing their donations well. All campaign expenditures are reported on either a weekly or monthly cycle (Sunlight Foundation, 2012). So, a Super PAC could raise and spend a lot of money a few days before the election, and not have to report the sources until after the election. It can be difficult to trace where this money is coming from. This lack of transparency coupled with the influx of new money has dramatically concerns many politicians and watchdog groups. Limitless spending and uncertainty of the money’s origin makes it harder to hold politicians accountable, as we don’t know what interests they might represent, or who has access to them. Therefore, these institutional changes in campaign spending require a fresh look at the extent of money’s role in determining elections.
Campaign Finance Data

The data set for this study consists of 137 close House races from the 2010, 2012 and 2014 election cycles. Races were considered “close” based on the same *Congressional Quarterly* qualifications used in Abramowitz’s 1991 study. In *CQ’s* list of notable House elections, the races were qualified as: pure toss-ups, leaning for one party, likely for a party, or safe for a party. Races that were toss-ups, close or likely were included in the dataset. I chose House races because there are many more House elections to examine per cycle and so my number of cases is greater. 2010 was the starting point given that it was the first election with the new campaign finance laws in place. 2016 would have been included, but the 24-month FEC reports won’t be published until after this study is complete. The data set includes 65 elections from 2010, 46 from 2012, and 26 from 2014.

For the independent variables of challenger and incumbent spending, I use logged inflation-adjusted dollars spent in each respective election cycle. In order to find total spending, I added money spent by the candidate’s campaign with total PAC and Super PAC money spent in their favor. This means that any money spent on negative ads against one candidate is counted as money spent by their opponent. For example, if a Super PAC spent one million dollars on negative ads against Angie Craig, it would be counted as one million dollars in favor of Jason Lewis. All of the data concerning campaign spending came from the FEC’s database. After campaign expenditures and independent expenditures were added together, the totals were adjusted for inflation in 2014 dollars. Accounting for inflation standardizes the money spent across different election cycles. I logged campaign expenditures,
because they were often 10 or 11-digit figures. Including numbers this large in the model would lead to very small coefficients in other variables of interest. Therefore challenger and incumbent spending were lagged in order to give other variables more explanatory power.

For the dependent variable, vote share, I looked at the percent of the two party vote won by the incumbent. Although this excludes open races from the data set, it becomes easier to measure all challenger-incumbent races, and there are very few open seats per election cycle, so the sacrifice is rather minimal. The vote totals were found from the *Washington Post* and *Politico* House election results. I use percent of the two-party vote in order to exclude third party candidates who take a few percentage points of the total vote. By doing it this way, getting higher than 50 percent guarantees a win for one candidate, whereas a candidate could win with less than 50 percent of the vote otherwise.

To measure partisanship of the district, I included the percent of the district that voted for Obama in the previous election. Given that Obama was in office for all the election cycles of interest, measuring his percent of the vote is the easiest way to hold district partisanship constant. While this measure certainly isn’t perfect, as support for a candidate doesn’t always equal belief in a certain party, consistent party voting in elections is more common than split ticket voting. Thus, the most recent national measure of partisanship will be helpful in explaining Congressional election outcomes. The district presidential votes are available on ballotpedia.org. I also included incumbent party as a dichotomous dummy variable. If the incumbent
was a Republican they were given a zero, whereas Democrat incumbents were coded with a 1.

Incumbent tenure in Congress was measured by taking the log of total years served. If an incumbent had multiple terms of non-consecutive years, the two totals were added together. Time in congress was logged to fit the data better. The tenure of an incumbent can be found in many sources, I used Ballotpedia again to find it for my study. My last control variable is challenger strength measured on an 8-point scale. Points are awarded based on previous political experience, serving in a non-political office such as district attorney, or celebrity status. A more in-depth explanation is provided in appendix A.

In most of the models I included a dichotomous variable to account for the unusual wave election of 2010. Races that took place in the 2010 were represented with a 1, while elections in the other two cycles were given a zero. Additionally, interaction effects were included in their respective models by adding an interaction variable to the regression.

Lastly, my innovative measure of campaign spending, which looks at the difference in spending, was calculated by using a simple percentage function.

\[
\text{Difference in Spending} = \frac{(\text{Incumbent Spending} - \text{Challenger Spending})}{\text{Incumbent Spending}}
\]

By making the denominator only incumbent spending, I can look at the degree to which the incumbent outspent or got outspent by their opponent. This is consistent with measuring the dependent variable as percent of the two-party vote won by the incumbent. All models in this paper were run with multivariate OLS regressions.
Results

Table 1 displays the results from the first four models, which all use separate challenger and incumbent spending variables. The base model shows that challenger spending is statistically significant at the five percent level, and thus does affect vote share. This finding supports the expectations of H1 and previous literature, that challenger spending influences House elections. The coefficient for campaign spending is negative as expected, which means as challenger spending increases incumbent vote share decreases.

However, incumbent spending was not statistically significant in the first model. Although incumbent spending wasn't predicted to be as important as challenger spending, Erikson and Palfrey's model on close elections found both variables to be significant. Given the similarities in methodology, the expectation of statistical significance for incumbent spending seemed reasonable. However, this expectation was not met, as incumbent spending is not significant in this model.

Looking at control variables, incumbent party is significant at the .01 but district partisanship is not. Incumbent party's coefficient is negative, and almost twice as large as challenger spending's coefficient. That means being a Democrat is associated with a sharp decline in expected vote share. This finding makes sense given the abysmal performance of Democrats in 2010 and consistent Republican control of the House following ever since. However, the large coefficient of incumbent party relative to challenger spending suggests that party is a more influential indicator of vote share than money in the base model. This finding is very
surprising given the literature’s focus on the importance of spending, and relatively little mention of party.

On the other hand, district partisanship, challenger strength and tenure in Congress were not significant indicators in the base model. Additionally, the model itself lacks a lot of explanatory power. The R-square of the model, which tells us how much variation in the dependent variable (vote share) is explained by other variables, is .196. This means that the base model accounts for roughly 20 percent of the variation in House election outcomes. Despite incumbent spending not being an accurate indicator of vote share, \( H_1 \) was largely supported given the statistical significance of challenger spending. Unfortunately, many of the control variables weren’t significant, and the very small r-squared suggests that the model fails to account for a lot of the variation in different vote shares.

Adding the wave control considerably improves the model’s fit and explanatory power. As with the base model, challenger spending is once again significant, but this time at the 1 percent level. Similarly, the coefficient is negative and going in the correct direction. In fact, the coefficient is 50 percent larger in the wave election model than in the base model. Additionally, the wave election control variable is significant at the 1 percent level. The large negative coefficient implies that elections in 2010 were especially bad for incumbents, which we know to be the case. Controlling for the wave election reduced some of the noise contained in the spending and party variables, giving the model a more precise explanation of what factors influence vote share.
Once again, incumbent spending failed to be a significant indicator variable. Challenger strength, district partisanship and Congressional tenure also remained insignificant in the wave model. However, including the wave control reduced the influence of incumbent party on vote share. The previous model likely suffered from multicollinearity problems, in which the values of incumbent party had significant overlap with the 2010 election wave. Therefore, the wave model suggests that incumbent party isn’t a significant factor in predicting vote share. The wave model is also notable because of the large increase of the r-squared. Recall the base model had an r-squared of .196, compared to the wave model r-squared of .327. This finding suggests the wave model is superior to the base model at explaining changes in vote shares. Therefore, H₂ is mostly supported because challenger spending and the 2010 wave control are significant.

The third model in Table 1, which includes an interaction term between challenger spending and challenger strength, does not find challenger spending to be statistically significant. Furthermore, the interaction term at the heart of the model isn’t a significant indicator of vote share. Although the r-squared is marginally higher, the 2010 wave control is the only statistically significant variable in the model. Therefore, H₃ has to be rejected because neither challenger spending, nor its interaction with challenger strength is significant¹.

¹ Because the challenger strength variable failed to be significant in any model, the interaction term with spending was also not a valuable indicator of vote share. This is likely due to challenger strength not being an accurate predictor of electoral performance. So, interacting it with challenger spending didn’t generate any significant findings.
The last model includes the interaction between incumbent party and district partisanship. Challenger spending is once again significant at the 1 percent level, and has roughly the same coefficient as in the wave model. To better understand exactly how much challenger spending affects vote share in this model, marginal effects estimates from the regression table were used to calculate the average challenger spending required to unseat an incumbent. The model suggests that all else equal, challengers would have to spend on average $2.65 million to get at least 50.01 percent of the two party vote share. Furthermore, a $1,272,189 addition or subtraction of spending (one standard deviation shift) in challenger spending would cause a 1.35% shift in percent of two party vote share. Although there is significant variation among the cost of House races, these figures are useful benchmarks for approximating how much money serious challengers will need to spend in order to be competitive.

Going back to the model, the interaction term is also significant at the one percent level. This supports the intuitive assertion that the value of an incumbent’s party changes with the relative partisanship of their district. The wave election variable is also significant, but with a slightly smaller coefficient than before. Like the three previous models, incumbent spending, congressional tenure, and challenger strength are not significant indicators of vote share. As a result, $H_4$ isn’t completely supported, but the core claims in the hypothesis do hold weight. Challenger spending, the wave control and the partisanship/party interaction are all significant at the 1 percent level and the modest increase in the R-square value to .365 is also a notable improvement from the wave model. Therefore, this final model
is the best so far at explaining election results, because of the many significant indicators and relatively large explanatory power represented by the R-squared.

The next model group uses the difference in campaign spending variable instead of different measures for incumbents and challengers, the regression results are displayed in Table 2. The base model in this group finds that difference in campaign spending is not statistically significant. This finding was not expected and differs from $H_1$, which found challenger spending to be a significant indicator of vote share. The incumbent party and district variables are significant with party having a very large coefficient, similar to the first base model. Additionally, logged tenure and challenger strength are not significant indicators of vote share. The model also suffers from a small r-squared or .19. All in all, $H_5$ is not supported because the percent difference in campaign spending wasn’t significant.

The spending difference with wave control model makes similar improvements that we saw in model group A. Relative difference in spending becomes significant at the 5 percent level, and the coefficient grows larger. The new wave election variable is also significant at the 1 percent level. Resembling previous results, the district partisanship remains significant while incumbent party fails to. This finding suggests there is a fair deal of continuity in the variance across both sets of models. Once again, challenger strength and tenure are not significant variables. The R-squared also jumps up to .289, suggesting that the wave variable explains a fair amount of change in vote shares. Therefore, $H_6$ is supported because the core assumptions of spending difference and wave election significance are met.
Furthermore, the larger r-squared suggests this model has more explanatory power than the base model.

Lastly, the partisanship/party interaction model with spending difference reflects many of the same trends found in the separate spending models. The spending difference variable is significant at the 5 percent level. Calculations from the regression table find that for challengers to get more than fifty percent of the vote, they would have to outspend incumbents by roughly 111 percent (more than double). Put another way, for every 47 percent more a candidate outspends their opponent (a single standard deviation shift), they would get an additional 1 percent of the two party vote. The interaction term variable is also significant at the 1 percent level, as is incumbent party and the wave control. Staying consistent, challenger strength and time in Congress were not significant in this model. The R-squared enjoyed another modest increase coming out to .312. Therefore, \( H_7 \) was supported because spending difference, wave control and party/partisanship interaction were all significant. The increased R-square also suggests this interaction model has the most explanatory power among other spending difference models.

Ultimately, both models were predictive of vote share regardless of which independent variable was used. With the exception of \( H_3 \), all hypotheses were supported except for incumbent spending being significant. Furthermore, inclusion of the wave election variable and the district partisanship/Incumbent party interaction term were consistently significant and increased the R-square across both types of models. Considering the similar coefficients and R-square values, on
the surface it’s hard to say definitively which model is better at explaining campaign-spending effects. That being said, the challenger-spending model has a little more explanatory and predictive power than the spending-difference model. The challenger-spending model has a larger R-square and the independent variable is significant at the 1 percent level instead of the 5 percent level. I will now discuss the benefits and limitations of each model in more depth, as well as their implications for campaign spending effects.

**Discussion**

Most of the models found many significant factors that influence vote share. In the party-partisanship models, which were the best at explaining vote share variation, challenger spending, difference in spending, wave election control, and the partisanship interaction were all statistically significant. Conversely, challenger strength, years in Congress, and incumbent spending weren’t significant in any of the models. Incumbent party had the largest effect on vote share in both models. While part of the coefficient’s size is due to how dichotomous variables function in a model, the large effect on vote share suggests that party is an extremely important factor in recent House elections. Despite Tip O’Neil’s famous phrase, “all politics are local,” the currently historic low levels of split ticket voting (Jacobson and Carson 2016) and the large coefficient for incumbent party suggest that partisanship could be becoming a more important cue for voters than actual policy promises.

The wave election variable was also consistently significant across all models. This finding isn’t surprising given what we know about the unprecedented nature of the 2010 elections. The combination of *Citizens United* and national
outrage against Obama led to a historic defeat for incumbent Democrats, even those who had served in the house for more than twenty years! This ties in to the fact that tenure in Congress was not a significant indicator of vote share in any of the models. This finding is surprising because many previous studies cite longer tenure as a huge advantage for incumbents (Abramowitz 1991, Jacobson 1985, Silberman and Yochum 1978). One explanation for this change can be found from looking at recent Washington approval ratings. A 2016 Gallup poll found only 8 percent of Americans have a lot of faith in Congress. These numbers suggest many Americans have become fed up with career politicians, and might want outsiders to come shake up the system. The millions of Americans who listed Donald Trump’s lack of political experience as a reason they supported him supports this claim. Therefore, while experience in politics may have been an advantage in the past, long serving Members of Congress, especially in competitive districts, may have a harder time getting reelected.

Linked to the decline of tenure as an advantage, challenger strength was statistically insignificant in all seven of the models. One possibility is that Green and Krasno’s eight-point scale to measure challenger quality has become outdated since 1988. As the political climate has gotten more polarized and campaign dynamics have altered, their methodology for assessing challengers does not accurately represent what makes for a strong candidate. Alternatively, their scale might work just fine, but the American people may have grown fed up with normally strong political challengers, as mentioned before. This assertion makes sense in light of the Tea Party’s dramatic rise to power in 2010. For many Tea Party candidates to win
the general House election, they first had to defeat more moderate Republicans in primaries. Notable establishment politicians like Eric Cantor lost to extreme candidates from the right, whose appeal was in part their lack of experience and promise to shock the political system. Therefore, the finding that challenger strength wasn’t significant makes some sense given the current political climate.

The largest divide in the campaign spending effect literature has been the importance of incumbent spending. While Jacobson and Abramowitz didn’t find incumbent spending to be significant, Erikson and Pelfrey found it to be somewhat significant, and Green and Krasno claimed it to be just as important as challenger spending. In model group A, spending by incumbent Members of Congress failed to be significant. Intuitively, incumbent spending must be somewhat important, because otherwise they would never bother raising money. One interpretation of the lack of significance could be that incumbent spending is in many ways a constant. Incumbents will always have a good chance of at least matching if not outspending all challenger opponents. This claim is supported by the fact that incumbent spending is never significant, but difference in spending is consistently. Another possibility is that incumbents possess so many inherent advantages, that their money has a much smaller return than money spent by challengers. Lastly, Jacobson’s assertion that incumbents spend more the closer they are to defeat is worth considering. However, incumbent spending would had to have been significant with a negative coefficient for my model to support this claim, so his theory seems unlikely. Even if incumbent spending isn’t statistically significant, there clearly must be some degree of its importance.
Although models with challenger spending and difference in spending both had significant findings, the use of two different variables for spending seems to be superior for a variety of reasons. On a simple comparison, the model for $H_4$ has a .05 higher R-square than the model for $H_7$. While this is not a massive difference, the extra explanatory power is worth noting. More importantly though, the challenger-spending model gives a clearer picture of how much money is required to wage a competitive election. The $2.65$ million “competitive” benchmark is informative for campaigns looking to figure out how much money is needed to wage an effective campaign. Furthermore, this cutoff amount is more helpful and practical than the relative amount a challenger must outspend the incumbent for both politicians and political scientists.

For those trying to run a successful campaign, it isn’t very realistic to assume a challenger is going to spend more than double their opponent, given all the fundraising advantages incumbents have. Of the 137 cases, only 4 challengers managed to reach that threshold. Therefore, the relative spending model doesn’t shed much light on the nature of how much money affects House elections.

The small coefficient of spending difference relative to that of incumbent party and the wave election is one potential reason why the percent that challengers must outspend incumbents is so high. Because the coefficient for the wave control is twice as large as the coefficient for challenger spending, predicting the amount of money required to win an election should be done carefully and with a few grains of salt. Given the large coefficient and small R-square, both models likely suffer from omitted variable bias. According to the spending difference model, the incumbent
party plays a far more significant role in vote share than spending differences. At face value, it would be fair to assume party plays a significant role, but the extent suggested in the model seems dubious. Because the coefficient for party is so large, it would make sense that the variable measure includes other important factors pertaining to elections.

Furthermore, as Figure 2 shows, only twelve challengers over three election cycles were able to outspend their opponents by fifty percent, let alone 111. Even if challengers manage to outspend incumbents, there is no guarantee of winning an election. As Figure 2 also displays, only half of challengers who spent more than their opponents actually won their contest. The data suggests that while outspending is important and boosts a challenger's chances, it is not a sufficient condition for victory. No observation demonstrates this claim more than the 2012 House race in Florida's 18th district. Patrick Murphy (D) challenged sitting Congressman Allen West (R) in what was the most expensive race in House history. While Murphy spent a respectable $10 million dollars, West spent just over $24.5 million. Despite this massive discrepancy, Murphy prevailed by getting 50.3 percent of the two-party vote. These findings demonstrate that simply outspending your opponent, even if by a dramatic margin, is not sufficient to guarantee success.

On another level, the campaign spending difference model is more useful as a retroactive measure of campaign dynamics, than as a prediction for electoral potential. Neither campaign will know how much they outspent their opponent by until after the election is over. Although data on campaign spending will be available during the course of a race, if spending between the candidates is relatively close, it
will be hard to tell who has a current advantage and the upper hand going forward. For this reason and the ones listed above, the spending difference model does not appear to be a superior way of measuring campaign expenditure effects.

That being said, the incumbent and challenger-spending model does have a few limitations. Most obviously, House elections come in many different shapes and sizes. As a result, the $2.65 million level suggested for challengers to be competitive is an average that must be scaled to the individual races to be meaningful. Figure 3 demonstrates this reality by showing that more than half of challengers who reached the predicted threshold lost anyway. Therefore, interpreting House results based on specific money amounts should be done with caution and a healthy dose of skepticism. Furthermore, the small r-squared suggests that there are variables omitted from this regression that would help to explain election results.

In order for the model to more accurately predict House elections, a variable controlling for different media market costs would have to be included. Adding this factor should increase the R-square significantly, and provide more generalizable explanatory power for specific House races going forward. One possibility would be adding demographic data on income, age or race to the model. Previous studies on House and Senate campaigns have found that parties tend to attract different demographics of people (Gerber 1998), so including these factors should improve the model’s fit. Lastly, a variable that controls for region would likely improve the model’s function. Different areas of the country prioritize different campaign issues. As a result, different campaign subtleties may be on display in different parts of the
nation despite the increasing nationalizing of Congressional races. Including all or some of the factors should be helpful additions to future research.

**Conclusions**

Ultimately, the findings on campaign spending effects are somewhat inconclusive. On the one hand, campaign spending clearly does not play a deterministic role in House elections, as shown by the difference in spending model. Multiple regressions demonstrate that incumbent party, and district partisanship also play a critical role in affecting vote share. On the other hand, the requirement of raising over $2.65 million dollars for most challengers to be competitive isn’t a very precise predictor level. Many challengers spend more than this amount and still lose. Even challengers who spent over $6.3 million dollars (2 standard deviations away) only won around half of those house races. Because of the steep monetary requirements, candidates would have to spend significant time fund raising just to have a chance of winning. Behaving in such a manner once again raises important questions about the influence of money in politics, and the access of wealthy contributors to some of the country’s most important lawmakers. If members of Congress need to solicit so much money from powerful individuals, it seems almost inevitable that they spend less time listening to and consequently representing their non-wealthy constituents.

In terms of model comparisons, the results suggest that the traditional model, of separate variables for incumbent and challenger spending, is superior. The challenger-spending models had higher R-square values, and more significant variables. The regression tables reveal that the campaign spending effects found by
Jacobson and Abramowitz continue today. Despite the institutional changes created by recent Supreme Court rulings, the effect money has on House elections appears to be comparable to the effects in the 1980s. To further investigate this claim, a study could be conducted comparing pre and post-*Citizens United* election effects, and measuring the difference. Additionally, using an instrumental model or expanding the data set to include more House cases could prove fruitful.

Given the knowledge on campaign spending effects, there are critical policy implications about the best ways to regulate campaign expenditures, increase transparency, and make elected official more accountable. For elected representatives to be held responsive, they need to participate in elections where losing is a possibility; otherwise what reason do they have to listen to constituents. In recent decades, the amount of close House races has gone down considerably (*New York Times*, “No Country for Close Calls,” 2009). However, many races aren’t competitive because of gerrymandering, sorting of voters, and the gulf in fundraising ability between an incumbent and a weak challenger. Some policymakers critical of campaign spending amounts in elections propose limiting expenditures in a given election cycle. If challengers benefit from spending more than incumbents however, this expenditure cap could disproportionately hurt challengers, and make it harder for incumbents to be unseated. Although long serving lawmakers are highly experienced about the inner-workings of Congress, having a system that enables career politicians can make it harder for constituents to hold their elected representatives accountable.
Another possible policy avenue is public financing of elections. Many countries in Europe publicly finance campaigns and set strict limits on expenditures. Countries such as France have even limited the campaign season to less than a month! Unfortunately, these solutions are quite unlikely to happen in the U.S. The Supreme Court ruled in *Arizona Free Enterprise Fund v. Bennett* that the Arizona state law requiring campaign funds to be matched was unconstitutional. Therefore, many states attempting to publicly finance elections will have difficulty surviving court challenges. Additionally, the U.S. has a long and drawn out election process that won't change any time soon. Unless the media fundamentally changes the way they cover elections, focusing on the horse race instead of governing ability, our campaign cycle isn't going anywhere. Therefore, solutions from other countries don't seem to be viable at changing the campaign system.

If campaign structure can't change, one option is to shed more light on the election and donation process. Since the Supreme Court rulings on campaign finance regulations, there have been multiple Congressional attempts to increase transparency by enacting The Democracy Is Strengthened by Casting Light On Spending in Elections Act (DISCLOSE). The DISCLOSE Act, which would require organizations to publicize more information on campaign spending, has failed to pass Congress despite multiple attempts (Garrett 2014, 101). With a polarized Republican-controlled Congress, passing any campaign finance reform seems unlikely. Therefore, challengers will generally need to match the amount spent by incumbents in order to be competitive. Going forward, the trend of incumbents raising prodigious amounts of money seems likely. Considering that 80% of 2012
PAC money went to incumbents, the new rules from *Citizens United* might have actually made it even more difficult for challengers to be competitive. Ultimately, without a reinterpretation of the relationship between money and free speech, it’s unlikely that trends in campaign spending will change any time soon.

**Figures:**

![Total Outside Spending by Election Cycle](image)

*Figure 1: Data from OpenSecrets.org 2016*
Vote Shares When Challengers Outspent Incumbents

Outcomes When Challengers Spend More than $2.65M

Figure 2

Figure 3
Table 1

<table>
<thead>
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<th>(Base Model)</th>
<th>(Wave)</th>
<th>(Challenger Int)</th>
<th>(Partisanship Int)</th>
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<td>(0.137)</td>
<td>(0.182)</td>
<td>(0.130)</td>
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<td>0.040 (df = 129)</td>
<td>0.040 (df = 128)</td>
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<td>8.948*** (df = 7; 129)</td>
<td>7.932*** (df = 8; 128)</td>
<td>12.440*** (df = 6; 130)</td>
</tr>
</tbody>
</table>

Note: model uses robust standard errors

*p<0.1; **p<0.05; ***p<0.01
The Challenger strength variable is an 8-point scale created in Green and Krasno’s 1988 study. There are two main branches for how the scale works depending on if the challenger has held elected office before. If they held public office before, they get four points. Challengers also get an additional point for:

### Table 2

**Relative Campaign Spending Effects**

<table>
<thead>
<tr>
<th></th>
<th>Incumbent Vote Share:</th>
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<tr>
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<td>(Base)</td>
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<td>District Partisanship</td>
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<td>(0.001)</td>
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<tr>
<td>Party:Partisanship</td>
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<tr>
<td>Congressional Tenure</td>
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<tr>
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<tr>
<td>Challenger Strength</td>
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<td></td>
<td>(0.002)</td>
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<tr>
<td>2010 Wave Election</td>
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<td>Constant</td>
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<td>Observations</td>
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<td>Adjusted R²</td>
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<tr>
<td>Residual Std. Error</td>
<td>0.043 (df = 131)</td>
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<tr>
<td>F Statistic</td>
<td>6.101*** (df = 5; 131)</td>
</tr>
</tbody>
</table>

*Note: Model uses robust standard errors

*p<0.1; **p<0.05; ***p<0.01

**Appendix A**

The Challenger strength variable is an 8-point scale created in Green and Krasno’s 1988 study. There are two main branches for how the scale works depending on if the challenger has held elected office before. If they held public office before, they get four points. Challengers also get an additional point for:
currently sitting in office, holding an important local office such as state senator or party leadership, having made a previous Congressional run, and holding celebrity status. For those who haven’t held public office, there are a host of traits and accomplishments that give one point. The complete list and factoring of points is down below.

**Construction of Challenger Political Quality (CPQ)**

- **Group 1**
  - Type of office (+1)
  - Currently in office (+1)
  - Previous congressional run (+1)
  - Celebrity status (+1)

- **Group 2**
  - Previous candidate for political office (+1)
  - Previous congressional run (+1)
  - Nonelective office (+1)
  - Type of nonelective office (+1)
  - Political activist/party connections/political aide (+1)
  - Professional status (+1)
  - Celebrity status (+1)

**KEY:** Political office = elective office.

**Appendix B**

The original models suffered from problems of non-constant error variance. Regressions using robust standard errors were used to address this issue. The models were free from problems of multicollinearity and non-normality. Despite a few observations in which exorbitant amounts of money were spent, no observations proved to exert too much leverage on the model. The one race that
came close was incumbent Allen West (R) from Florida's 18th district against Patrick Murphy in 2012. Despite West spending over $24.5 million compared to Murphy's $10 million, Murphy prevailed in one of the tightest races of the cycle. Given the large discrepancy in spending, both models would have predicted a win for Allen West. His defeat didn’t seem to affect the models too much, as it passed outlier tests and a Cook’s distance test.

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