

Fake It ‘Til You Make It: New Avenues for Challenger Success Through Campaign Spending

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Abstract

Previous scholarship on congressional elections has identified the amount of campaign funds raised as a key predictor of a candidate’s success on Election Day. But the actual spending of these funds, and the manner and strategy by which candidates do so, has gone understudied largely due to data limitations. In this paper, we parse transaction-level data on House campaign expenditures provided by the Federal Election Commission to investigate specific ways in which House challengers can gain leverage over incumbents and increase their chances of success on Election Day. We find strong evidence that challengers fare far better electorally not simply by spending more money, but also when their spending decisions mirror those of their incumbent opponent on three mostly-unaddressed characteristics: the timing of candidate spending; how much candidates spend in the geographic confines of the district; and what they spend the money on. Based on these characteristics, we create an index of ‘spending likeness’ between challengers and incumbents and find that challengers who reflect the spending habits of their incumbents are able to improve their electoral margins, even after controlling for important electoral features such as differences in total spending amounts, district and national partisan competition, and challenger quality. Our results suggest that nuanced spending choices play a key role in predicting the electoral success by both challengers and incumbents in congressional elections.

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Introduction

Congressional observers, journalists, and even members themselves are quick to turn to the amount of campaign funds raised as a key predictor of a candidate's success on Election Day. The equation is straightforward: the candidate who has more money to spend courting voters is seen as the most likely to win the seat, as candidates with bigger 'war chests' are able to spend more campaign funds on television and radio advertising, voter data operations, campaign consultants, and get out the vote efforts. And for incumbents in particular, a sizable war chest can help scare off quality challengers. For these and other reasons, financial viability in a political campaign is seen as a primary determinant of electoral success.

Unsurprisingly, a great deal of political science attention has been devoted to detailing the links between campaign fundraising and a host of subsequent congressional activities, including the specific effects of campaign funds raised on eventual congressional election outcomes and vote shares. Scholars have long focused on how incumbents and challengers differ in their institutional and political advantages in fundraising, and how these advantages translate to campaign and electoral success. Too often, however, such studies focus on simple totals of amounts raised and neglect the many decisions candidates and campaigns must make in how those raised funds can be best deployed to increase their vote share.

This paper speaks to an element of the study of campaign fundraising that has surprisingly gone overlooked: the actual spending of the money candidates raise. More specifically, we compare spending decisions of incumbents and challengers and their impact on electoral margins and outcomes. Improving upon a comprehensive Federal Elections Commission dataset of all itemized campaign expenditures for every House of Representatives candidate from 2010-2016, we assess the spending characteristics of challengers and incumbents

on three specific characteristics: timing of spending, location of spending, and proportions of types of spending. By geo-tagging, time-tracking, and categorizing spending data at the transaction level, then aggregating to the candidate-level, we are able to speak to patterns and differences in campaign spending decisions that have previously gone unaddressed.

Ultimately, we find strong evidence that challengers fare far better electorally not simply by spending more money, but also when their campaign spending decisions mirror those of their incumbent opponent on each of our three spending characteristics. Additionally, we create an index of ‘spending likeness’ between challengers and incumbents and find that challengers who reflect the spending habits of their incumbents are able to improve their electoral margins, even after controlling for important electoral features such as differences in total spending amounts, competitiveness of the district and challenger quality. These results suggest that the nuances of campaign spending by candidates play a key role in predicting the electoral success by both challengers and incumbents in congressional elections.

Literature Review

The bulk of scholarly attention paid to campaign fundraising and expenditures has largely focused on two broad categories of inquiry: fundraising totals as a signaling device and how campaign spending affects electoral outcomes and vote shares.¹ In the first category--funds as signals--campaign fundraising and expenditure totals have commonly been shown to be effective signaling devices for candidates to a variety of interested observers. Candidates for office, and

¹ This paper will not delve into the vast literature on effects of specific types of advertising, such as spending on negative ads (e.g., (Lau, Sigelman, and Rovner 2007) and how effective certain portrayal of candidates persuade voters (e.g., (Abrajano and Morton 2004). Instead, this paper focuses on the nuances of candidate spending; the differences in what incumbents and challengers actually spend campaign funds on and how those differences may impact success or failure at the ballot box.

particularly incumbents, utilize the transparent and public nature of campaign finance reporting to highlight their fundraising “war chests” as a means of deterring quality challengers from entering the race (e.g., Epstein and Zensky 1995). Low fundraising numbers, and the accompanying perception that a candidate has difficulty convincing donors to invest in his or her campaign, often translates into conclusions that the candidate is not a serious threat; for incumbents, it can mean the seat is vulnerable to strong challenger (Jacobson 1978, 1990). The importance placed on maintaining strong fundraising numbers for signaling purposes has resulted in constant pressure on candidates to continuously dial for dollars, and has been shown to lead to members focusing their time and attention on likely donors rather than constituents who may not contribute to the campaign (Francia 2003).

Candidates also see their fundraising totals as an effective signal to potential donors and voters of their viability as a candidate (Coate 2004; Ortuno-Ortin and Schultz 2005; Potters, Sloof, and van Winden 1997), or to cue interest groups and organizations to provide support to a likely successful candidate who will eventually make policy decisions related to their industries (Ashworth 2006; Prat 2002a, 2002b; Wittman 2005, 2007). Relatedly, Herrnsen (2007) shows that the timing of fundraising matters, especially for challengers, as a means of proving their electoral mettle to political parties, interest groups, and political action committees.

The second category of empirical work examines the relationship between campaign funds and their effects on electoral outcomes and margins. Jacobson (1990) notes the “clear and remarkably consistent” differences in spending effects for challengers and incumbents in writing “In campaigns against incumbents, the more challengers spend, the more votes they receive, and the more likely they are to win. The more incumbents spend, on the other hand, the lower their vote and the greater their chances of losing” (334). Numerous studies confirm the strong

relationship between higher levels of challenger spending and better results on Election Day (Glantz, Abramowitz, and Burkart 1976; Jacobson 1985, 1989), while incumbent spending often produces reduced vote shares (Feldman and Jondrow 1984; Levitt 1994; Ragsdale and Cook 1987). Other studies, however, find that more spending on behalf of Senate incumbents actually produce higher vote shares (Abramowitz 1988; Grier 1989; Moon 2006).

Questions of campaign fundraising and spending have also presented theoretical problems for scholars in that spending may influence vote shares, while expected vote share certainly, and simultaneously, affects campaign fundraising and subsequent spending (Stratmann 2005; 1995). In an effort to correct for these endogeneity concerns, Gerber (1998) makes use of two-stage least squares regression, and ultimately finds that incumbents who spend more fare better electorally. Milyo (1999) simply argues that no consensus on the impact of campaign spending on vote shares has emerged.

New Powers of the Purse

Primarily due to limitations in available campaign expenditure data, most scholarly attention paid specifically to campaign spending has used simply aggregated totals of spending over short periods of time (Coleman and Manna 2000; Green and Krasno 1988, 1990). This aggregation limits the explanatory power of campaign spending because total expenditures are unable to differentiate the effects between types of spending, such as funds spent on television advertising versus get out the vote efforts. Ansolabehere and Gerber (1994) and Herrnson (2007) provide rare insight to how candidates vary in the proportion of funds spent on myriad campaign activities. The former study coded 1990 mid-term candidate spending into several categories and found that as challengers could disproportionately increase their eventual vote share by

increasing the amount spent voter communications. Herrnson (2008) surveyed campaign manager and candidate surveys in order to ascertain percentages of campaign funds spent on various features of their respective campaigns.

Despite these few examples, nuanced campaign spending activity deserve a more thorough examination. Simple totals are too blunt of a measure and are subject to methodological and theoretical challenges given its inherent endogeneity with competitiveness. By studying transaction-level deployment of resources via campaign expenditures, we gain more granular insight into the preferences and strategies of campaigns. Moreover, better understanding how campaigns differ in exactly how they spend their raised funds will provide more depth to questions regarding spending and its effects on congressional elections.

These nuances in spending behavior, which go beyond aggregate amount totals, are made possible by parsing data made available by the Federal Election Commission, which catalogs every individual expenditure made by each Congressional campaign for recent election cycles. Many previously-ignored data points offer possible avenues for analyzing specific spending habits, but this project makes use of three spending characteristics in particular: timing, location, and type of spending. Each of these characteristics offers information about the differences between incumbents and challengers that are not apparent in aggregate analyses, and that we argue can help predict the circumstances under which challengers will fare better against incumbents.

The mechanism by which these characteristics vary in favor of challengers goes beyond simple quantities of campaign cash spent. Instead, we posit that when challengers' spending habits more closely align with those of the incumbents they face, they put themselves in a better position to succeed. One reason we expect this to be the case is that incumbents know how to

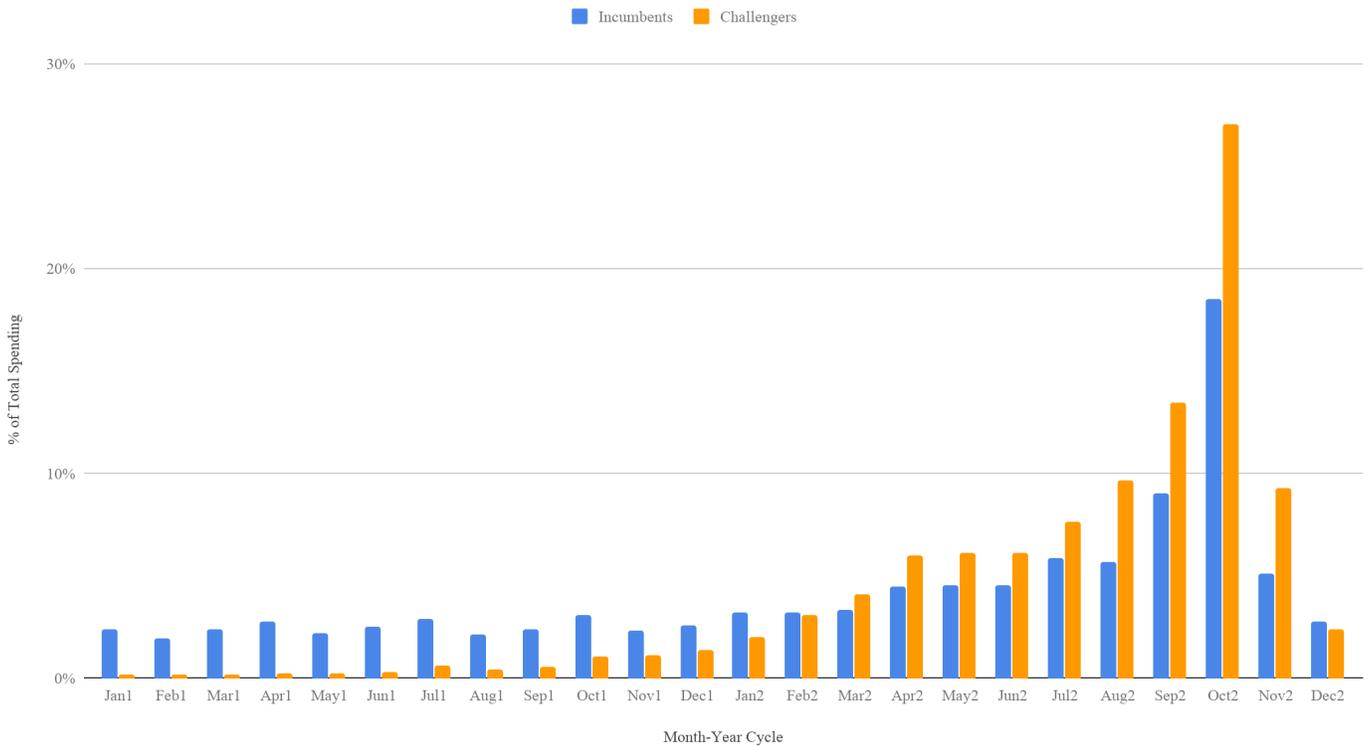
win, and by definition have experience in doing so. Even amidst a sizable anti-establishment political reaction taking place over the last several elections, the incumbent reelection rate has remained high; in fact, it has risen precipitously since 2010, and was 97% in the 2016 elections.² On all three spending characteristics we analyze, incumbents in the aggregate have consistently lower standard deviations than challengers in our measures, indicating that incumbents follow something of a “winning formula.” They know when, where, and how to spend their money wisely. It follows that one reason challengers may be consistently unable to replicate incumbents’ success is because they are in many cases unable to replicate their spending patterns. Previous scholars have put this in terms of “equalizing” spending between challengers and incumbents (Gerber 1998), but have relied only on candidate spending totals to make this argument. We make a more nuanced argument in this project: that on the key characteristics of timing, geography, and content, challengers who are better able to replicate incumbents’ spending patterns fare better in their electoral outcomes than those who are not.

The first spending characteristic we observe is timing. When do candidates spend, and how much? We know already that early fundraising on the part of well-positioned incumbents helps defend against the emergence of quality challengers in the so-called “scare-off effect” (Carson, Engstrom, and Roberts 2007; Hall and Snyder 2015). Earlier we addressed the question of “war chests”, but spending data gives us information about the timing by which incumbents and challengers actually deploy the contents of the war chest. Figure 1, for example, shows the key difference between challengers and incumbents in terms of the timing of their spending decisions. Incumbents front-load small percentages of their funds at a steady pace throughout the cycle’s off-year, while challengers ramp up their spending much closer to the election itself.

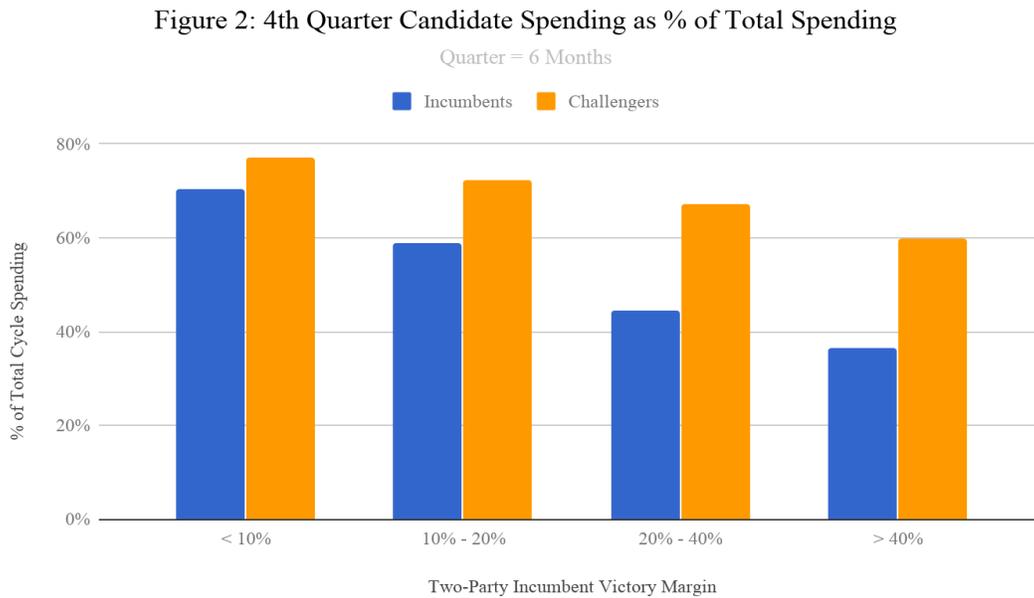
² <https://www.opensecrets.org/overview/reelect.php>

Much of this, of course, is due to the fact that incumbents often file for reelection very soon after the previous one, while challengers - quality or not - are more likely to wait and see how the political winds blow and do not file - and therefore do not spend - until the election year itself. But the timing of spending is also an indicator not just of scaring off challengers: for a challenger (or a lower-term incumbent), early spending is an indicator of presence in the district, getting to know constituents, and trying to increase name recognition; disproportionately late spending, on the other hand, may indicate something of a “mad scramble” or last-ditch effort to win. As we will demonstrate, nuances in this type of campaign activity can have differing effects on candidate success and on the state of an individual race as a whole.

Figure 1: Per-Month Expenditures as % of Total in House Races, 2010-2016



But there is reason to believe there are differences between candidates that goes beyond challenger or incumbent status. Differing habits of timing may actually affect differences in competitiveness and eventual outcomes. Figure 2 breaks incumbents and challengers down by eventual victory margin, showing the percentage of candidate spending done in the “fourth quarter” of the election cycle (in this case, July - December of the election year).

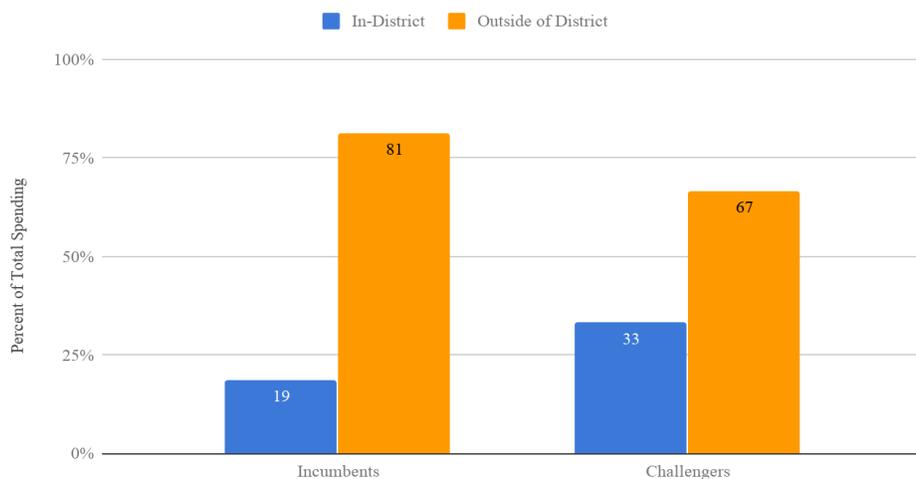


The proportion of challenger spending in this descriptive figure shows the narrowing distance between incumbents and challengers in late-cycle spending as the race becomes tighter. We will use more advanced statistical techniques to show that this pattern is an independent phenomenon affecting congressional elections by testing our first following hypothesis:

Hypothesis 1: Challengers fare better electorally against their incumbents when the timing of their spending patterns is more closely aligned with their incumbents.

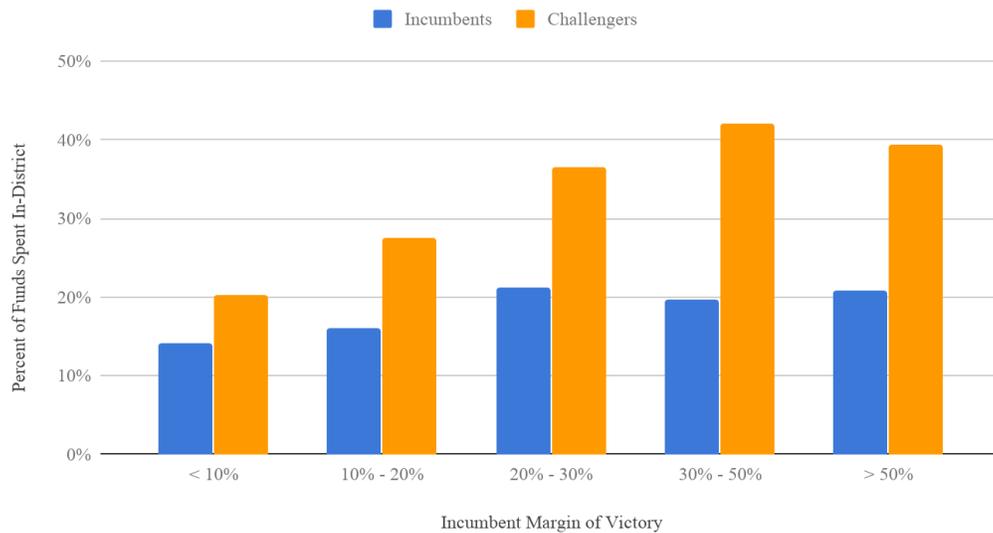
Second, we identify the locational differences between challenger and incumbent spending habits. Geographic variables have been shown to matter in a number of important ways in congressional elections, particularly in terms of candidate emergence (Gimpel, Lee, and Thorpe 2011), campaign donations (Gimpel, Lee, and Pearson-Merkowitz 2008), and incumbent characteristics (Hunt 2018). In this case, we argue that where candidates spend their money offers information about what they value, and about how well-connected they are both to political forces both within the district and outside of it. Figure 3 below shows the nonrandom differences that emerge between challengers and incumbents in terms of their in-district spending; the result is perhaps surprising. One might expect that incumbents, with their longer political history in the district and purportedly well-established roots in the electorate, would do more of their spending within the district; on the other hand, they are also likely to be better-connected within their parties, and transfers made to other campaigns may artificially inflate this number.

Figure 3: Average Pct. of Total Spending by Location, 2010-2016



However, those differences between incumbents and challengers vary significantly depending on the nature of the race. As with the timing of candidate spending, a descriptive look at races in the aggregate shows us that challengers seem to fare better when the geographic spending habits follow those of their incumbents. As in Figure 3, Figure 4 splits up races by electoral competition and shows challengers in very close races (less than 10% margin) tracking closely with incumbents in terms of spending within the district. That challengers consistently spent much larger proportions of their resources within the district indicates that they do not have access to the same statewide or national networks of political and business relationships that could allow them to spend more efficiently.

Figure 4: Average Pct. of Funds Spent Within the District, 2010-2016



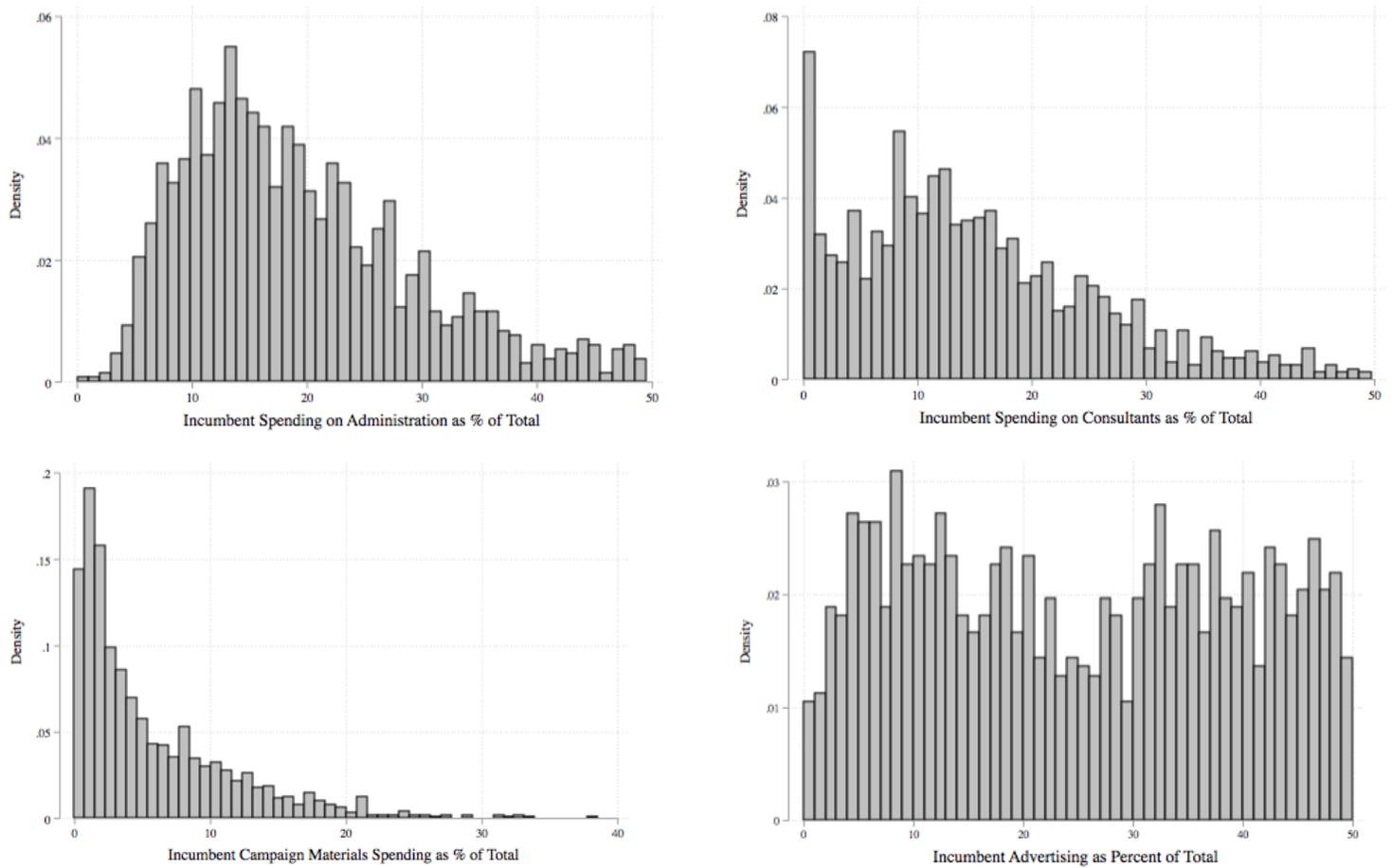
As with the timing of candidate spending, then, the location of this spending seems to matter as well in terms of differentiating types of challengers and incumbents. As such, we propose a second hypothesis:

Hypothesis 2: Challengers fare better electorally against their incumbents when the geography of their spending patterns is more closely aligned with their incumbents.

And finally, we look at types of spending - what exactly challengers and incumbents are spending their scarce resources on.³ The balance among categories of candidate spending, such as advertising, polling, campaign materials, or administrative expenses, can tell us a great deal about the type of campaign a candidate is trying to run or where they might perceive their own weaknesses. Not all types of spending are created equal, and there are established practices and norms that campaign experts follow in order to be successful - for example, a candidate wouldn't (and shouldn't) spend 90% of their funds on lawn signs. Distributions of the proportion of resources that incumbents use on each of these kinds of activities shows the nonrandom differences between them, as shown in Figure 5. These differences lead us to believe that incumbents and their campaigns put strategic thought into these spending categories and how to distribute their resources; in effect, they may have a proven "winning" formula that, along with other well-documented built in advantages, helps them achieve reelection at such high rates.

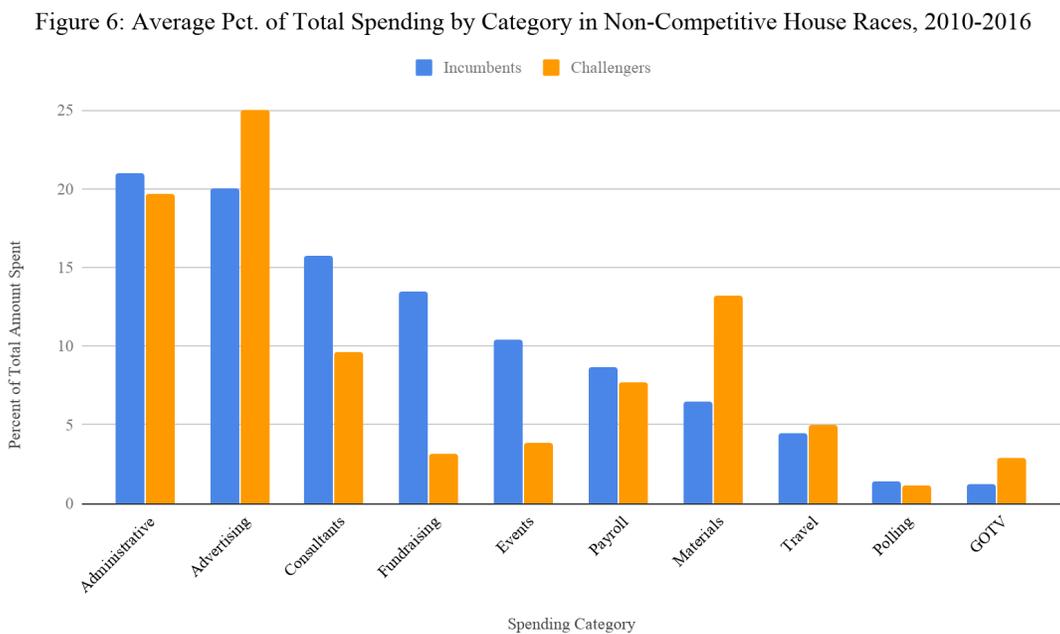
³ In their processed transaction-level data, the FEC has for several cycles provided a rough categorization of spending categories, such as advertising, events, and fundraising, among others. These categories, and the behaviors they reveal in candidates, are underused in the literature, but they are also deeply flawed in the original data. In the Data & Methods section, we will expand on how we have increased the accuracy and precision of these categories, as well as vastly improved the amount of categorized expenditures to provide a more comprehensive picture of the types of spending incumbents and challengers engage in.

Figure 5: Distributions of Spending Types as Percent of Total Spending



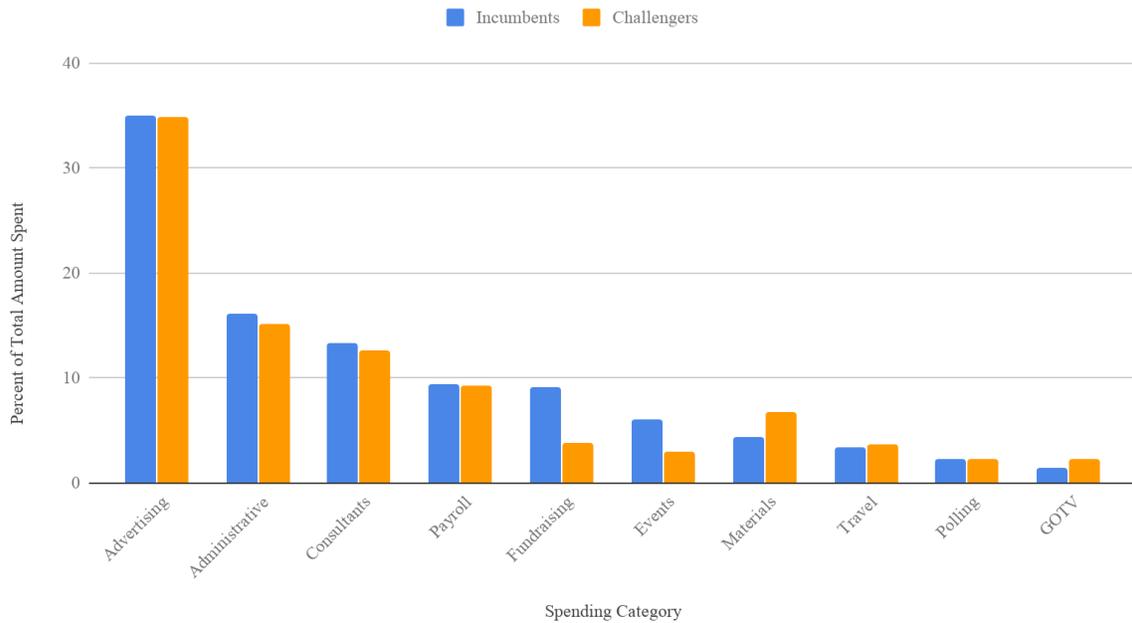
Further, the descriptive evidence shows us that while most incumbents and challengers do spend in all categories, incumbents have a more cohesive “formula” than challengers do - for example, the standard deviations of percentage of funds spent on each category are much smaller for incumbents in almost all cases, suggesting that challengers vary more widely and, in the aggregate, lack the guiding force of parties or seasoned political operatives and campaign staff. Most importantly, these differences play out in terms of competitiveness. The extent to which

challengers can help themselves by matching their spending patterns to those of their incumbents is easily visualized in Figures 6 and 7. Figure 6 first shows the categorical distribution in spending types from challengers and incumbents; Challengers in these races tend to overspend on advertising and campaign materials (like lawn signs) and underspend on fundraising and events.



In competitive races, on the other hand, incumbents and challengers are practically mirror images of each other. Advertising, as expected, gets an outside role in these contests, but note that incumbents and challengers spend almost exactly the same proportions of their campaign funds on this category. In very few categories do competitive challengers differ significantly from their incumbent counterparts in the aggregate.

Figure 7: Average Pct. of Total Spending by Category in Competitive House Races, 2010-2016



As such, we propose a third hypothesis that predicts similar outcomes to the previous two categories of spending likeness between challengers and incumbents:

Hypothesis 3: *Challengers fare better electorally against their incumbents when the balance of categories of spending they pursue are more closely aligned with those of their incumbents.*

All three of these spending characteristics demonstrate a clear descriptive pattern: challengers who “spend like incumbents” appear to be far more successful than those who are not. We therefore will also utilize a unified index of these variables as a test of the unifying concept of “spending likeness.”

Hypothesis 4: *Challengers fare better electorally against their incumbents when their overall spending habits and patterns are more closely aligned with those of their incumbents.*

While our descriptive evidence has shown promising results, we must also control for a number of important elements of congressional elections like challenger quality, partisan competition, and national political environment, among others. The following sections will show our data improvements, methodological strategy, and advanced results which confirm our hypotheses.

Data & Methods

The data points necessary to capture the spending habits we analyze in this paper were found in the Federal Election Commission's candidate expenditure data for the House of Representatives, which compiles every individual transaction from each filed candidate for office for the 2010-2016 cycles. While the FEC data comes almost fully cleaned, it contains a number of little-used measures that we take full advantage of in this project to measure different elements of spending likeness between challengers and incumbents. These variables and their operationalizations, as well as the dependent variables and relevant controls, can be found in Table 1.

Table 1: Independent and Dependent Variables, Operationalizations, and Controls

Variable	Operationalization
<i>Dependent Variables</i> Challenger Success	Two-Party Margin (Challenger % - Incumbent %)
<i>Independent Variables</i> Timing Likeness	Absolute value, (Incumbent 4Q Spending as % of Total) - (Challenger 4Q Spending as % of Total) ⁴
Geographic Likeness	Absolute value, (Incumbent % of Spending In-District) - (Challenger % of Spending In-District)
Content Likeness	Sum of all categories' absolute value difference, i.e. (Incumbent Advertising % - Challenger Advertising %)
Spending Likeness Index	Factor score of Timing Likeness + Geographic Likeness + Content Likeness
<i>Controls</i> District Partisan Competition	Cook Partisan Voting Index (Positive = Favorable to Challenger)
National Partisan Competition	Challenger's two-party share of generic congressional ballot pre-Election Day
Overall Challenger Spending Deficit	Total Challenger Spending - Total Incumbent Spending
Challenger Quality	Binary (1 if challenger has prior political experience)
Incumbent Chamber Leadership	Incumbent is committee chair or member of party leadership in the House
Incumbent Tenure Length	Incumbent's number of terms served in the House
Nonwhite Incumbent	Binary Indicator
Southern District	Binary Indicator

First, the data contains a date and dollar amount for each individual transaction throughout the two-year cycle. We extracted these dates and aggregated at various levels to

⁴ Absolute value differences for all three Likeness Factors were subsequently inversed so that higher values = greater similarity between challenger and incumbent for simplicity of interpretation.

provide an overview of how much each candidate spent in a given month (as seen in Figure 1 earlier).⁵ We then aggregated further to “quarters” in the campaign - that is, the four six-month periods that comprise each election cycle. Difference between incumbents and challengers in fourth-quarter spending as a percent of their total spending is the measure we use for “Timing Likeness” in this project. This variable, along with other Spending Likeness measures, was then inversed so that larger values indicate greater likeness for interpretational simplicity.

The FEC data also includes the full address, zip code, city and state of the recipient of each transaction. We geocoded these addresses using ArcGIS, plotted them, and ran intersections with district shapefiles for the appropriate congress to ascertain whether each transaction took place in the candidate’s district or not. We then aggregated these transaction amounts for each candidate, and produced a variable measuring the percentage of total dollars that were spent inside vs. outside the district. Similarly to the timing variable, we then took the absolute value difference between incumbents and challengers in percent of in-district spending and inversed it to create a “geographic likeness” variable.

Finally, the FEC data includes FEC-defined categories for spending (i.e. advertising, polling, administrative, campaign materials, events), which were helpful as a baseline to know what types of spending candidates engaged in the most. However, only about 39% of all dollars in the original data are coded to a particular content category by the FEC. We were able to improve this categorization rate to 97% of all dollars spent by using regular expressions to extract categories from other data points, including the memo text included with each transaction. For example, uncategorized transactions with memoes that included words like

⁵ This aggregation represents yet another advantage of spending data over fundraising data, which is only required at quarterly intervals by the FEC.

“survey,” “poll,” or “public opinion” were coded under the “Polling” category.⁶ We then once again took the absolute value difference between incumbents and challengers in percent of spending on each category, summed these individual differences, and inversed the total to create a “content likeness” variable.

In addition to these three component characteristics, we also wanted to test the effect of overall “Spending Likeness” as a broader concept, since these three component measures capture different elements of spending, and therefore different elements of campaign strategy and electoral dynamics. To capture overall effects, we ran a factor analysis on the three previous variables of spending likeness to create a unifying index of Spending Likeness ranging from -2 to 1, with larger values corresponding to similarly-spending incumbent-challenger pairs.

To accurately assess the causal importance of these variables, however, it’s critical to control for the many well-documented predictors of challenger success or failure. The first and most heavily-used measure of expected competition in House races is district partisanship. In this project, we use the Cook Partisan Voting Index (PVI).⁷ The PVI has two distinct advantages as a measure of nationalized partisanship in the district: it compares the partisanship of the district to the national average, thus putting all districts on a consistent plane of measurement; it also averages the district’s distance from the previous two presidential elections, thus avoiding selection bias on a particular election or candidate. In order to capture the effect of the national

⁶ More examples, as well as a comparison between the FEC categories and our final categories, can be found in the appendix.

⁷ First calculated in the late 1990s by the widely respected political analysis firm The Cook Political Report, the PVI calculates this distance by measuring the difference between the average of the two-party presidential vote in the district over the last two presidential elections and the same average in the national as a whole. A district, for example, in which Republican presidential candidates fared 7 points better on average than in the nation as a whole would have a value of R+7. In the models used for this project, the PVI was assigned to the challenger according to their party. For example: for a Republican challenger in an R+8 district, they were assigned a “Partisan Connection in the District” score of 8. If, however, a Republican challenger was running in a D+5 district, they were assigned a score of -5. This accurately reflects the relative advantage (or, more often, disadvantage) challengers encounter in terms of attachment in their district to their particular party.

political environment, which is particularly notable in “wave” elections like 2006 and 2010, we use the challenger’s party’s share of the RealClearPolitics average of the two-party percentage of the “Generic Congressional Ballot” question often included in polling conducted in midterm election years.

Controlling for challenger quality is also of great importance to this project. To do this, we use the standard indicator from the literature: whether the challenger has previous political experience, according to data collected manually by the authors. Finally, lest these measures of “likeness” are simply an endogenous artifact of total spending differentials between incumbents and challengers, we also include a measure of the total spending deficit a challenger faced compared with the incumbent. Controlling for this broad spending measure increases the likelihood that our Spending Likeness variables are measuring the concept we are addressing.⁸ We also include several standard controls for type of incumbent, including incumbent’s tenure length, their leadership status in the chamber, incumbent’s race, and whether the district is located in the South.

The data in this analysis encompasses the 2010, 2012, 2014, and 2016 congressional elections. Because many of the observations include the same incumbent, we use OLS regression with random effects by incumbent to account for differing baselines of support that incumbents attain in their districts before being challenged. As such, our sample is also limited to races with candidates from both major parties with an incumbent. By excluding open-seat races, we essentially control for overall incumbency advantage and put all challengers on more equal footing in our comparison. The dependent variable will be the challenger’s two-party margin in

⁸ One important variable we omitted from this analysis was outside spending in the district, which can serve to shape race dynamics in many ways. It was omitted due to its high correlation with competitiveness; however, including it in the model does not significantly alter our results.

the district in the general election. Most of these values are naturally negative since most challengers lose, but as Table 2 indicates, there is much variation to explain, with margins ranging from -91 to 32.

Table 2

Descriptive Statistics - Two-Party House Contests (2010-2016)

<i>N</i> =2648	Mean	Std. Deviation	Min	Max
Challenger Two-Party Margin	-28.8	19.5	-91.4	31.7
Spending Likeness Index	0	0.6	-2.3	1.2
Timing Likeness	66.5	18.2	0	90.9
Location Likeness	-5	8.2	0	59
Category Likeness	267.1	165.7	0	437.8
Total Spending Differential	1326	1284.4	15	18167
Cook Partisan Voting Index	7.7	11.5	-43.2	41.2
Generic Cong. Ballot Pct.	49.6	2.9	44.9	55.1
Challenger Quality	0.1	0.3	0	1
Incumbent - Chamber Leadership	0.1	0.3	0	1
Incumbent - Chamber Seniority (year)	5.6	4.6	1	30
Nonwhite Incumbent	0.3	0.4	0	1
South	0.3	0.5	0	1

Results

Random-effects regression results for two models run on all the full sample - one that includes the overall Spending Likeness Index, and one with only the three component Likeness scores - can be found below in Table 3. The raw results are unambiguous - spending likeness, in all its forms, has a consistent, positive, and highly statistically significant effect on challenger margins in the district, even after controlling for partisan competition at the district and national level, challenger quality, total spending, and a slew of other electoral elements. The results are consistent whether Spending Likeness is specified as a factor index or as differentiated component variables.

Table 3
Effects on Challenger Margins (All Races) 2010-2016

Dependent Variable	Two-Party Challenger Margin (Index)	Two-Party Challenger Margin (Components)
Spending Likeness Index	4.23*** (0.56)	
Spending Likeness - Timing		0.04** (0.02)
Spending Likeness - Location		0.10*** (0.03)
Spending Likeness - Categories		0.06*** (0.01)
Total Spending Difference (Logged)	-0.39 (0.40)	-0.40 (0.40)
Challenger Partisan Advantage - District	1.55*** (0.05)	1.55*** (0.05)
Challenger Partisan Advantage - National	0.76*** (0.08)	0.72*** (0.08)
Quality Challenger	2.59*** (0.83)	2.61*** (0.83)
Incumbent Chamber Leadership	1.63 (1.08)	1.50 (1.08)
Incumbent Chamber Seniority	-0.23*** (0.08)	-0.24*** (0.09)
Nonwhite Incumbent	0.06 (0.99)	-0.09 (1.00)
South	1.42* (0.72)	1.53** (0.73)
Election Year 2012	1.30* (0.69)	1.28* (0.69)
Election Year 2014	1.43** (0.68)	1.63** (0.69)
Election Year 2016	1.29* (0.68)	1.40** (0.68)
Constant	-47.64*** (4.82)	-77.46*** (6.17)
R-Squared (Between-effects)	.81	.81
N	1072	1072

Results found using random-effects generalized least squares regression;

Standard errors (in parentheses) clustered around incumbents.

*p < .1, **p < .05, ***p < .01

To fully interpret the substantive practical effect of Spending Likeness on challenger margins, however, we have also calculated the predicted marginal effects on the dependent

variable at different values of the independent variable. This test, which is visualized in Figure 8, shows that challengers with the lowest levels of Spending Likeness with their incumbents are, all else equal, predicted to lose by nearly 35 points, while challengers with the highest similarity of spending habits with incumbents are only predicted to lose (on average) by a little over 19 points. In summary, we estimate that in the average race, challengers stand to gain as much as 16 points just by adjusting their spending habits. Figure 8 not only clearly demonstrates the positive effect spending likeness has on challengers' general election margins, but also the statistical certainty associated with this relationship, as measured by the 95% confidence intervals bounding the linear prediction.

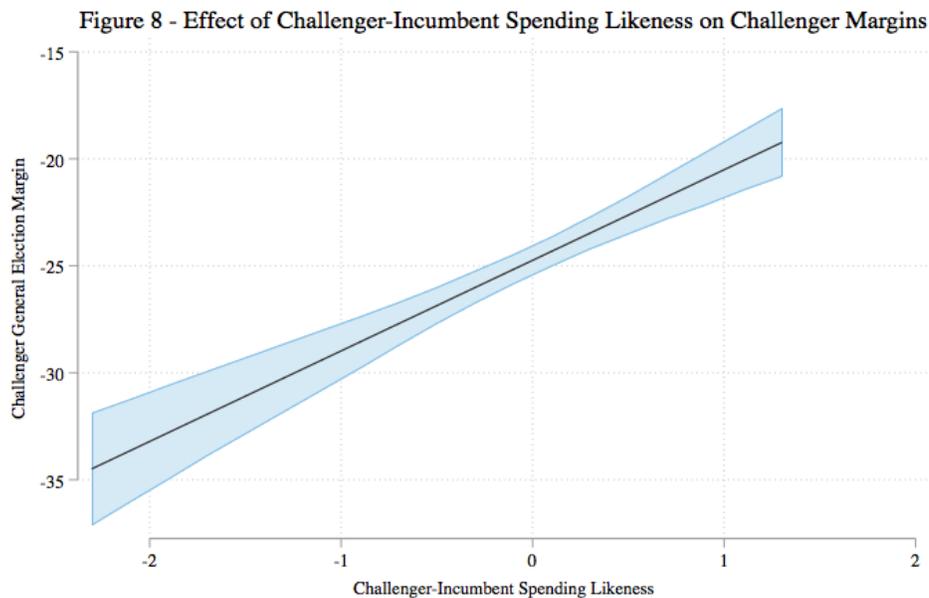


Figure 8 predicts the challenger's general election margin in the district at different values of the independent variable, Challenger-Incumbent Spending Likeness in House races from 2010-2016. The linear prediction is bounded above and below by 95% confidence intervals at different independent variable values.

Our models predict similar, and even more substantively significant effects when limited only to competitive House races, the results of which can be found in Table 4. Here we see

similarly strong and consistent findings in favor of Spending Likeness as a positive predictor of challenger electoral margins. In competitive races, however, it appears that geographic likeness matters more than in all races, and that Timing Likeness is no longer statistically significant, but the size of the coefficient remains the same.

Table 4
Effects on Challenger Margins (Competitive Races Only), 2010-2016

Dependent Variable	Two-Party Challenger Margin (Index)	Two-Party Challenger Margin (Components)
Spending Likeness Index	5.36*** (0.95)	
Spending Likeness - Timing		0.05 (0.03)
Spending Likeness - Location		0.24*** (0.06)
Spending Likeness - Categories		0.07*** (0.02)
Total Spending Difference (Logged)	-0.12 (0.53)	-0.09 (0.52)
Challenger Partisan Advantage - District	1.26*** (0.09)	1.23*** (0.09)
Challenger Partisan Advantage - National	0.21 (0.29)	0.21 (0.29)
Quality Challenger	1.24 (1.01)	1.28 (1.02)
Incumbent Chamber Leadership	-1.41 (1.99)	-1.44 (2.01)
Incumbent Chamber Seniority	-0.21 (0.17)	-0.17 (0.17)
Nonwhite Incumbent	2.62 (2.24)	2.38 (2.22)
South	1.10 (1.24)	1.02 (1.20)
Election Year 2012	-2.18 (1.67)	-2.51 (1.65)
Election Year 2014	-1.81 (2.50)	-2.00 (2.50)
Election Year 2016	-3.46* (1.93)	-4.01** (1.90)
Constant	-17.00 (15.92)	-57.20*** (17.66)
R-Squared (Between-effects)	.70	.72
N	368	368

*Results found using random-effects generalized least squares regression;
Standard errors (in parentheses) clustered around incumbents.*

*p < .1, **p < .05, ***p < .01

In any case, the Spending Likeness Index remains highly statistically significant and, as Figure 9 below indicates, predicts an even larger substantive effect in competitive races than in all races. In this case, we find that Spending Likeness can affect challenger margins by as many as 19 percentage points. Not only is this effect numerically larger than in all races, but each point carries more weight in competitive races, which are often decided by single-digit margins. The bottom line is the finding that challengers' spending habits can essentially have the effect of swaying a competitive House race.

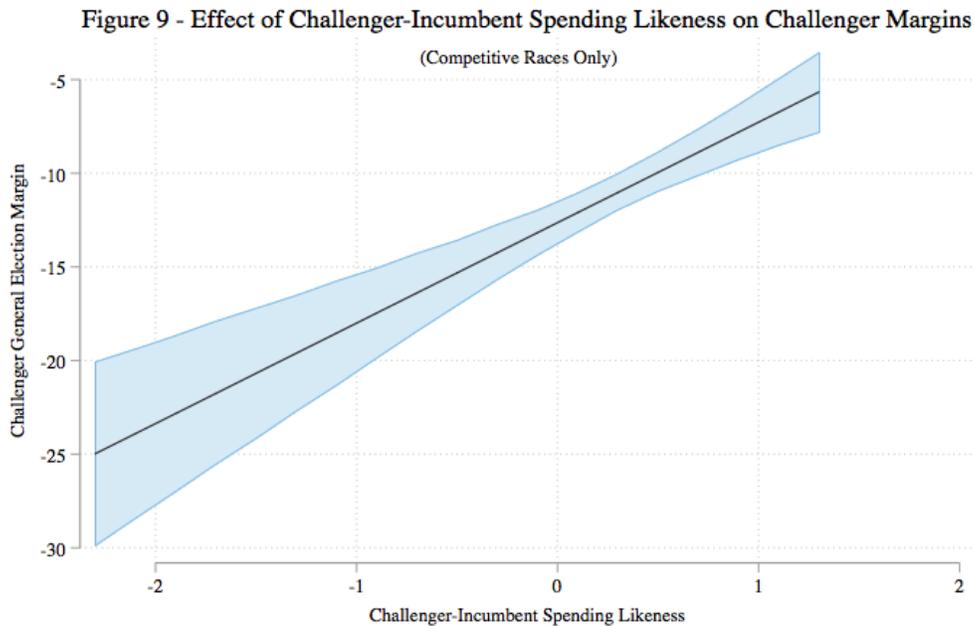


Figure 9 predicts the challenger's general election margin in the district at different values of the independent variable, Challenger-Incumbent Spending Likeness for competitive races from 2010-2016. The linear prediction is bounded above and below by 95% confidence intervals at different independent variable values.

A final promising statistic for our analysis concerns model fit. For both the indexed and component tests run on all cases (Table 3), the r-squared was .81, meaning that our model explained 81% of all variation in electoral margins between challengers and incumbents in the

four elections in our analysis. The r-squared value was nearly as high in the “competitive-only” models despite having fewer cases, reaching 70% and 72% for the indexed and component models respectively. These values indicate that Spending Likeness should perhaps be a key component in future models purporting to predict campaign effects on electoral outcomes.

Discussion

This work makes a number of important contributions to the literature on congressional elections. First, it brings the act of spending and the decision-making process behind it into the foreground alongside the previous attention given to fundraising as a foundation of congressional elections. Fundraising is and will remain an important structural indicator of candidate strength and of electoral competitiveness generally; but spending decisions, particularly at the level of detail allowed by our analysis of transaction-level data, not only give us information about competitiveness, but are tangible member-level actions that offer a window into the strategic process by which incumbents and challengers execute their campaigns.

Second, the detail offered by this data opens a new array of options available to scholars interested in how candidates deploy their resources and which ones are most effective in their pursuit of electoral success. The descriptive information uncovered in Figures X-X indicate key differences between incumbents and challengers, but also give empirical heft to previous assertions that different types of spending - for example, advertising - are more prevalent in competitive rather than non-competitive races. The granularity of this data at the very least offers new, more empirically-precise ways to assess old truths of the study of congressional campaigns.

Most importantly, this research should help open new avenues of study into the nuanced electoral dynamics between challengers and incumbents more generally. Research on

incumbency, for example, has found many examples of structural advantages offered by being an incumbent, but has uncovered much less about what proactive steps challengers can take to cut into this advantage other than spending larger quantities of campaign resources they may not have. Our findings suggest that there is something of a “formula” for resource allocation in House elections that improves chances of victory, and that challengers would do well to more closely examine their own spending patterns beyond simple quantity.

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Appendix

Original FEC Categories	Hunt and Burgat Recodes
Administrative/Salary/Overhead Expenses Advertising Expenses Campaign Event Expenses Campaign Materials Donations Loan Repayments Political Contributions Polling Expenses Refunds of Contributions Solicitation and Fundraising Expenses Transfers Travel Expenses	Advertising Administrative Consultants Payroll Fundraising Events Materials Travel Polling GOTV Refunds Transfers Repayments Pol. Contributions Donations
% of Dollars Uncategorized: 61.1%	% of Dollars Uncategorized: 3.3%