Campaign Styles: Persistency in Campaign Resource Allocation*

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Abstract

How do candidates allocate their campaign resources and when do they update their strategies? Using data of over 3.5 million expenditure items submitted by candidates who ran for House seats between 2004 through 2014, we provide a detailed picture of how candidates allocate their limited resources among different categories of activities. Although even those candidates who ran in the same race were significantly different in their campaign resource allocations, monthly expenditure patterns over the course of the campaign period across six election cycles are remarkably similar. Candidates rarely updated their campaign resource allocations, even when they face varying qualities of challengers and different sets of voters due to redistricting. We also find that outside groups' spending after the *Citizens United* decision in 2010 did not affect how candidates allocated their resources. We provide evidence that persistent contractual relationships with the same consultants and campaign vendors may explain these patterns.

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1 Introduction

Electoral campaigns design strategies to gain more votes and win elected offices. Although this claim is remarkably straightforward and simple, there is still a great deal of uncertainty about what constitutes the most effective strategy to secure those goals. As one campaign operative told researcher Richard Fenno, "Seventy-five percent of all the money we spend in a campaign is wasted. But we don't know which 75 percent" (Fenno 1978). While scholars have spent a considerable amount of time examining whether levels of campaign spending affect election outcomes (Jacobson 1978, 1985; Green and Krasno 1988; Jacobson 1990; Green and Krasno 1990; Abramowitz 1991; Levitt 1994; Erikson and Palfrey 1998; Gerber 1998; Erikson and Palfrey 2000; Benoit and Marsh 2008), there has been relatively little attention given to understanding how congressional candidates allocate their campaign spending (Fritz and Morris 1992; Ansolabehere and Gerber 1994).[1]

It is important to examine candidates' resource allocation decisions to understand the underlying relationship between campaign spending and electoral outcomes. The effectiveness of campaigns on electoral outcomes critically hinges on how candidates allocate their limited resources depending on electoral landscapes. Even when two candidates spend exactly the same amount of money, if their resource allocations are starkly different it could affect their electoral outcomes. In addition, it is important to understand if candidates alter the allocations of their campaign resources when electoral circumstances change. For example, if redistricting changes the composition of voter pools, are candidates more likely to spend more dollars on polling to learn about new voters? Or, if outside groups that are increasingly involved in campaigns spend heavily on media to support a candidate, is the candidate more likely to reduce spending on media and allocate more resources to other campaign activities?

Depending on the factors considered, the existing literature provides starkly different predictions about whether campaigns update their strategies. First, the literature focusing on the internal

[1] Scholars have also studied the allocation decisions of presidential candidates (Brams and Davis 1974; Bartels 1985; Smidt and Christenson 2012) and party organizations (Snyder 1989).

dynamics of campaigns assumes that there is little variation across candidates and little change within campaigns in terms of their resource allocations. Due to profound uncertainty about the effectiveness of campaign strategies, candidates who won elections are inclined to repeat their past practices and other candidates are prone to follow the winning candidates' methods (Jacobson 2009). Incumbents' risk aversion to try new strategies also contributes to the consistency of campaign strategies over time (Kingdon 1968). Even if there are new innovations adopted by challengers and unknown candidates, other candidates quickly imitate the strategies that seem work (Hershey 1984; Jacobson 2009). Also, modern campaigns are run by campaign professionals, such as political consultants (Sheingate 2016), and hiring the same consultants results in similar campaign strategies (Nyhan and Montgomery 2015). Combined, the literature on the internal dynamics of campaigns suggests that candidates show little variation in terms of their allocations of campaign resources (Herrnson 2012).

In contrast, the literature focusing on external forces, such as media environments and interest group involvement, argue that campaigns constantly adapt to new realities. For example, during the 2008 election, the Obama campaign's adoption of technology and its use of social media received much attention (Miller 2008). Changing media environments, including the rise of cable news channels and political news sites, reportedly change the political game and campaign operatives endlessly seek original strategies to adapt to a new landscape of political competition (Peters 2011). Another external force that could substantially change how candidates design campaigns is the increase in independent spending by organizations and wealthy individuals after the *Citizens United* decision by the Supreme Court in 2010. Although outside groups that engage in independent expenditures are not allowed to coordinate with individual candidates, there were many single-candidate Super PACs that are dedicated to electing specific individual candidates (Briffault 2013). The media has also reported on how candidates' campaigns and individual Super PACs coordinated on campaign strategies (Gold 2015). Combined, existing discussions suggest that changes in the external environments of campaigns, such as a rises in the use of new media and the amount of outside spending, profoundly changes candidates' strategies to win elections.

In this paper, we take advantage of detailed campaign expenditure reports posted by the Federal Election Commission (FEC) to provide a comprehensive description of campaign resource allocations and to examine how internal and external forces influence those allocations. Since 2004 election cycle, the FEC has required candidates, parties, and political action committees to disclose their operating expenditures via electronic filings. Only recently has the FEC released the detailed operating expenditure data as an aggregate file from the 2004 onward. This expenditure data includes information on when, why, and where each campaign spent its funds along with how much was spent. For this paper, we use data for expenditures made in House races from 2004 to 2014. In total, there were over 3.5 million observations of unique expenditures among the House races. We focus on expenditures that were made by campaigns of candidates who appeared on the general election's ballot. We classify the expenditures in one of six categories: administrative, staff wages, fundraising, media, polling, and political consulting. Using the expenditure date, we create panel data of monthly spending in each category for each candidate. This allows us to examine not only the total spending in each category but also how candidates changed their spending patterns through the entirety of the race.

First, in contrast to conventional wisdom, we find that there is significant variation in the allocation of campaign resources across candidates. The difference is mainly driven by a candidate's incumbency status and the district's characteristics, not by party affiliation. Incumbent candidates tend to spend relatively more of their campaign war chests on administrative costs, such as renting offices, and on wages. Among incumbents, politicians who face less electoral competition and have higher seniority spend more on administrative costs and staff wages and spend less on polling and consultants. Non-incumbent candidates spend relatively more of their money on the media. Competitive primary competitions and swing districts are associated with a relatively higher ratio of media and polling expenditures. Urban districts and districts with higher ethnic heterogeneity are associated with a higher ratio of administration- and fundraising-related expenditures, while the ratio of media expenditures is lower in those districts. We also find that even candidates running in the same district display starkly different allocations of campaign resources.

Second, we find that despite significant changes in the media environment and the dramatic increase in outside spending since the Supreme Court's *Citizens United* decision in 2010, there are remarkably similar dynamic patterns of spending across different election cycles at the aggregate level. We show that this is driven by the fact that individual candidates are remarkably consistent in their allocation of campaign resources over time. We test whether changes in challenger identity and quality, changes in the partisan leaning of a district, and voter composition due to redistricting affect candidates' resource allocations. We find that incumbents who face new challengers or high quality challengers were not different from the incumbents who faced the same candidates in terms of updating their allocations of campaign resources. Candidates who faced more changes in their districts' partisan-leaning, measured by the *Cook Political Report's* partisan index, and the changes in the composition of their voters due to redistricting in the 2012 election cycle, also did not show any difference in terms of changes in their allocations of resources.

Third, given that total outside spending rapidly increased after the Supreme Court's decision in 2010, it is possible that candidates would have adjusted their allocations of campaign resources since the majority of outside spending's focus was on the media and it would have changed the information flow in campaigns (Prato and Wolton 2017). However, we find that increases in spending by outside groups did not change candidates' allocation of resources across different electioneering activities. Together, this suggests that campaigns rarely update their campaign resource allocations. We argue that, along with candidates' tendencies to be risk-averse, persistent contractual relationships with consultants (Martin and Peskowitz 2015) and vendors in candidates' own districts - who are likely to be candidates' constituents - may explain the patterns we observe in the data and provide suggestive evidence for this claim.

Our paper makes several contributions to the literature addressing the effects of campaign spending and strategy. First, to our knowledge, this paper provides the most comprehensive examination of all types of campaign expenditures as well as total spending across different election cycles. This enriches our understanding of how campaigns allocate their resources across different strategies. Second, we provide information on how demographic and political characteristics of

districts are associated with candidates' allocations of campaign resources, and the conditions under which candidates update their strategies. Third, this paper provides empirical evidence of the relationship between outside spending and candidates' allocations of campaign resources. While many are concerned about the potential effect of spending by outside groups in the electoral process, our results show that, thus far, candidates rarely update their strategies in response to financial help from outside groups. Although the full impact of increases in outside spending requires a more thorough treatment, our results suggest that a lack of active updating of candidates' strategies may explain the limited impact of outside spending on elections (Abramowitz 2015).

2 Allocation of Campaign Resources

Each election cycle generates seemingly countless accounts lamenting the amount of money spent in American elections and the great influence money has on electoral results. Despite an increase in campaign spending over time and strong public perceptions about the relationship between money and electoral outcomes, academic research has produced mixed results about the effect of campaign spending on electoral outcomes. Some present evidence that spending by challengers has a substantial impact on election outcomes but spending by incumbents has relatively little effect (Jacobson 1978, 1985; Abramowitz 1988; Jacobson 1990). Others argue that the marginal effect of incumbents' spending is similar to the effect of spending by challengers (Green and Krasno (1988, 1990); Gerber (1998); Benoit and Marsh (2008)) and part of an incumbent's advantage can be explained by a general incumbent-spending advantage (Erikson and Palfrey 1998). Some research suggests that after controlling for a candidate's quality by examining repeated competitions by the same set of candidates, campaign spending has little effect on election outcomes, regardless of who does the spending (Levitt 1994).[2]

Even though previous researchers disagree on the effects of campaign spending, they share one thing in common: a focus on overall spending levels while leaving the composition of the expenditures in a black box. Although campaigns share a common goal - to reach voters and

[2]For a more detailed summary on the topic, see Jacobson (2015a).

persuade them to vote for their candidate - there is no consensus about the most efficient strategy to attain this goal (Jacobson 2009). Therefore, campaign strategies can be starkly different in their allocations of resources, despite the same level of campaign spending. To fully grasp the effect of campaign spending on election outcomes, it is necessary to examine how campaigns allocate their resources across different categories of spending in conjunction with their levels of spending.

Although there is a rich literature on the effectiveness of campaigns (e.g., Bartels 1993; Finkel 1993; Shaw 1999) or on one particular type of campaign strategy, either media spending (e.g., Stratmann 2009; Spenkuch and Toniatti 2018) or hiring political consultants, (Kolodny and Logan 1998; Medvic 1998; Cain 2011; Francia and Herrnson 2007; Grossmann 2012), there is considerably less research directly addressing the strategy of the composition of campaign expenditures. Campaigns have budget and time constraints; decisions about how much money to spend and where to spend it are inherently connected. Therefore, without knowing how campaigns allocate their available resources across different portfolios of strategies, it is difficult to fully understand the effects of various campaign strategies on electoral outcomes.

There are few studies that address this issue. Fritz and Morris (1992) analyzed 437,753 individual line items from FEC candidate reports into different categories for the 1990 congressional elections. Based on this data, Ansolabehere and Gerber (1994) separated the expenditures into actual campaigning activities and non-campaigning activities. They find that campaign communication spending is highly correlated with total campaign expenditures and challengers tend to spend a higher fraction of their expenditures on campaign communications than incumbents. By studying the 2002 congressional campaign, Herrnson (2012) suggests that while non-incumbents spent more on campaign communications, there was very little variation in candidates' budget allocations.

Existing research on the allocation of campaign resources improves our understanding about cross-sectional differences and similarities across candidates in a given election, but it does little to shed light on how overall campaign resource allocations change over time and how each candidate updates their allocations of campaign resources across different election cycles. This is surprising

given that much of the media's coverage and public's attention on electoral campaigns over the years has focused on how the new media environment, rise of Super PACs, and the role of political consultants change candidates' strategies.

There is a body of literature that examines how campaigns utilize social media to increase voter engagements such as campaign contributions and turnout (e.g., Cogburn and Espinoza-Vasquez 2011). Recent studies examine the effect of outside spending on electoral outcomes after the *Citizens United* decision in 2010 (La Raja and Schaffner 2014; Klumpp, Mialon, and Williams 2016). But neither strands of literature examine how changes in electoral landscapes influence candidates' allocation of resources. Christenson and Smidt (2014) examine how behaviors of Republican primary candidates in the 2012 election were associated with independent expenditure organizations to see if there was coordination between candidates and Super PACs. Although this paper investigates the relationship between independent expenditures and candidate spending, they only examine the total amount of spending by candidates and Super PACs across states for one electoral cycle; therefore, we do not know how - or whether - candidates change their allocations of campaign resources when outside spending pours into competitions.

The literature focusing on internal factors, such as candidates' perceptions of their probabilities of winning, argues that members of Congress often campaign exactly as they did the last time they ran due to profound uncertainty about the effectiveness of campaigns (Fenno 1978). House members particularly expressed worries over uncertainties created by redistricting and the arrival of new challengers. But, we know little about whether candidates update their allocations of campaign resources when they face these new challengers or follow strategies from their last elections. To fully understand how campaign spending affects electoral outcomes, it is important to know how campaigns allocate their available resources across different portfolios of strategies, as well as when campaigns do or do not update their allocations.

3 Data and Stylized Facts

We use the FEC's campaign expenditures data for our analyses. The FEC's definition of an expenditure is "a purchase, payment, distribution, loan, advance, deposit or gift of money or anything of value made to influence a federal election."[3] The FEC has required that campaigns file electronic reports on any expenditures since the 2004 cycle and that they post aggregate expenditure files for each election cycle to the FEC's website. The FEC has made the itemized expenditure data available on its webpage since 2013. We downloaded FEC data for the 2004 to 2014 election cycles. Collectively, 8,040,527 itemized expenditures were made by federal campaigns during this time.[4]

The total expenditures file comprises all forms of expenditures, including presidential and senatorial races. For this paper we only consider expenditures made by candidates running for seats in the House of Representatives. Using the unique committee identifiers generated by the FEC and associated with each expenditure, we merge data from the FEC committee list to name the candidate associated with each expenditure. We include 3,508,533 House expenditures.

Each expenditure line states the vendor's name, city, state, date of the payment, and amount of money paid to a vendor by a candidate's committee. It also includes a purpose for the expenditure, such as "Fundraising Consulting Fee" or "Office Supplies," as self-reported by each campaign. Using over 500 keywords, we place the expenditures into one of six categories. The first category is administration. Expenditures of this type cover travel, office supplies, food, and other general administrative expenses. The second category is wages, which covers expenditures on payrolls, salaries, retainers, and payroll taxes. Third, fundraising expenditures were linked to some form of fundraising activity. The fourth type of expenditure relates to media. We consider television, radio, print advertisements, and digital media together under the umbrella category of media. The fifth expenditure type we consider is polling purchases by the campaign. Finally, the sixth expenditure

[3] Federal Election Commission Campaign Guide, "Congressional Candidates and Committees," June, 2014. available at http://www.fec.gov/pdf/candgui.pdf

[4] Data source: http://www.fec.gov/finance/disclosure/ftpdet.shtml. The Operating Expenditures file contains disbursements reported on FEC Form 3 Line 17, FEC Form 3P Line 23, and FEC Form 3X Lines 21(a)(i), 21(a)(ii) and 21(b).

type pertains to the retention of political consultants by campaigns.[5] For example, from the expenditure file we know that on November 28, 2006, Nancy Pelosi's campaign spent $1,000 to place a deposit for a fundraising event to be held on December 9 at the Fairmont Hotel in San Francisco and that John Boehner's campaign spent $99 on postage at Ace Hardware in West Chester, Ohio on June 17, 2005.[6]

The FEC also nominally provides some expenditure categorizations. We used those if we were unable to classify an item through our protocol. While the FEC provides slightly different categorizations, each translates into one of our six categories.[7] Finally, we use vendor names that fit clearly into one of the categories to infer the expenditure type. For example, we assume that transactions containing the vendor name, "Bank of America," fall under the administration of a campaign. In such instances, we were able to place previously uncategorized expenditures into categories. In each election cycle, less that 5 percent of expenditures could not be categorized.[8]

Not all expenditures clearly fit into these six categories. For example, the purpose of "polling consultant" was identified as both a polling and a consulting expenditure. We reviewed cases where purposes fit multiple categories and placed the expenditure in the most applicable grouping. In the example above, because the payment for the polling consultant was not directly spent on a poll but rather on a consultant related to polls, we opted to categorize it as an expense for a consultant. The other issue is that campaigns hire political media consultants to buy TV ads (Martin and Peskowitz 2018). Given that media consultants purchase TV ads on behalf of candidates, we categorize expenditures paid to media consultants under media spending.[9]

Since we are interested in how candidates change their allocations of resources over the course

[5] In Appendix B, we provide some examples of key words that were used to categorize expenditures.

[6] Images of each expenditure listed can be found in Appendix A.

[7] The FEC provides twelve different categories for expenditures that easily map to our six categorization scheme. To see these expenditure categories, visit http://classic.fec.gov/finance/disclosure/metadata/CategoryCodes.shtml.

[8] Examples of categories that could not be classified were "See Below" or "Reimbursement" as the only stated purpose. The occurrences of these sorts of purposes wane in the data through time. The election cycle with the highest number of classified expenditures was the 2014 cycle; while the 2004 cycle had the lowest number of classified expenditures.

[9] We acknowledge that our categorization on each expenditure item is not perfect given that each campaign might have idiosyncratic rules of reporting their expenditures. However, as far as the campaigns are internally consistent in terms of their reporting rules across different election cycles, our analysis on updating which includes a candidate fixed effect is not affected.

Table 1: Average Expenditure Patterns among House Candidates 2004 - 2014

Type	N[a]	Total($K)[b]	Admin.(%)	Wages	Fundraising	Media	Polling	Consultants
All	4,432	1,069	36.6	10.5	9.7	26.3	1.5	9.8
Incumbent	2,312	1,330	39.3	11.9	12.4	19.7	1.4	10.6
Non-Incumbent	2,120	784	33.6	9.0	6.7	33.5	1.6	9.0
Democrat	2,268	993	37.0	12.5	8.3	24.8	1.6	10.1
Republican	2,164	1,148	36.2	8.4	11.2	27.9	1.5	9.5

Notes: a. Total number of candidates in each category. b. Average total expenditures in thousand US dollars (2014 dollar terms).

of a campaign, we limit our focus to either Democratic or Republican candidates who ran in the general election.[10] In total, there are 4,432 candidate-years in 2,575 race-years over the six different election cycles.[11] For each candidate, we calculate total expenditures and ratios of expenditures by the six different categories.[12]

Table 1 presents the average total expenditures and the average proportion of spending by each expenditure category. The average expenditure by a candidate was about 1 million dollars; this is consistent with previous scholarly accounts (Herrnson 2012; Sides et al. 2015). On average, incumbents spent $1.3 million and non-incumbent candidates spent $784,000. While Republican candidates spent $1.14 million, Democratic candidates spent $993,000. Incumbent candidates tended to spend a higher proportion of their campaign war chests on administrative costs, such as renting offices or accounting services. Non-incumbent candidates spent relatively more of their money on the media. Although there is no clear partisan difference, Democratic candidates tended to spend more on staffing their campaigns and Republican candidates tended to spend more on fundraising-related activities. Table A3 in Appendix C presents the same summary statistics by each election cycle. The allocation patterns are quite stable across different election cycles, except for spending on hiring political consultants, which has increased over the last decade.

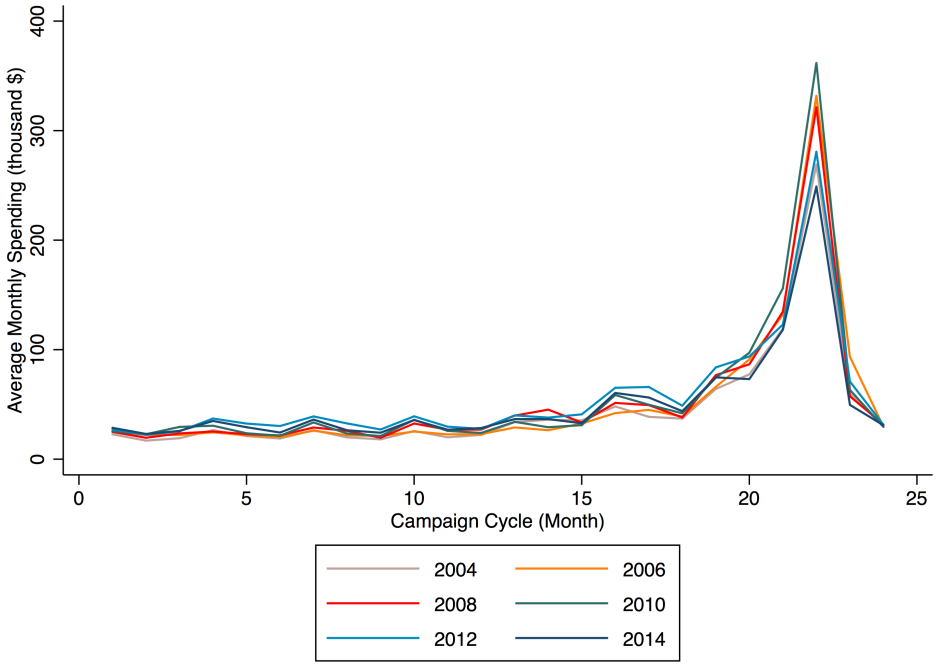
[10]Democratic or Republican candidates who ran in a primary but failed to appear on the general election ballot, and third party candidates are not included.

[11]There are some races where some candidates did not submit their expenditure reports electronically, especially in 2004 when the FEC required this for the first time. For those cases, we do not have their expenditure information. Table A1 in the Appendix shows the number of candidates and races in each election cycle in our sample.

[12]Detailed summary statistics for total spending and expenditures by category are available in Table A2 in Appendix C.

The panel structure of monthly expenditure data allows us to examine how expenditure patterns change over the course of campaigns. Given that House elections occur every two years, each House race comprises a 24-month campaign cycle. The 23rd month indicates when the election is held. For each campaign cycle, we calculate the average total monthly spending and the average ratio of expenditures in six different categories. Figure 1 presents remarkably similar patterns across different election cycles: Campaigns start to increase their spending around their party's primary period (around month 15) and expenditures dramatically rise as the general election approaches.

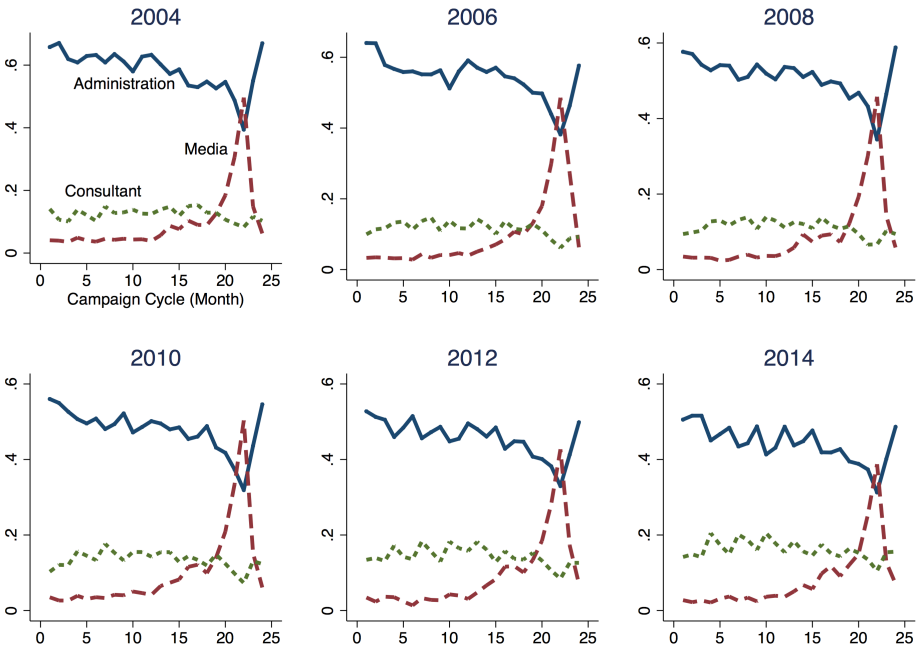
Figure 1: Monthly Total Campaign Expenditure Patterns



Although the monthly patterns of total spending are similar, it is still possible that the allocation of the same amount of money could vary over time. However, we find that this is not the case. To capture the different rates of increases in expenditures in different categories, Figure 2 presents monthly patterns of campaign expenditure allocations in administration, media, and political consultant payments in terms of a ratio. As election day approaches, the ratio of media expenditures quickly increases as the ratio of campaign spending on administrative expenditures

drops.[13] Across six election cycles, monthly patterns of campaign spending ratios at the aggregate level are remarkably similar, despite substantial changes in the media environment (namely the rise of social media and growth of the Internet) and landmark decisions by the Supreme Court on electioneering, such as the *Citizens United* decision.

Figure 2: Patterns of Monthly Campaign Expenditure Allocation Ratios



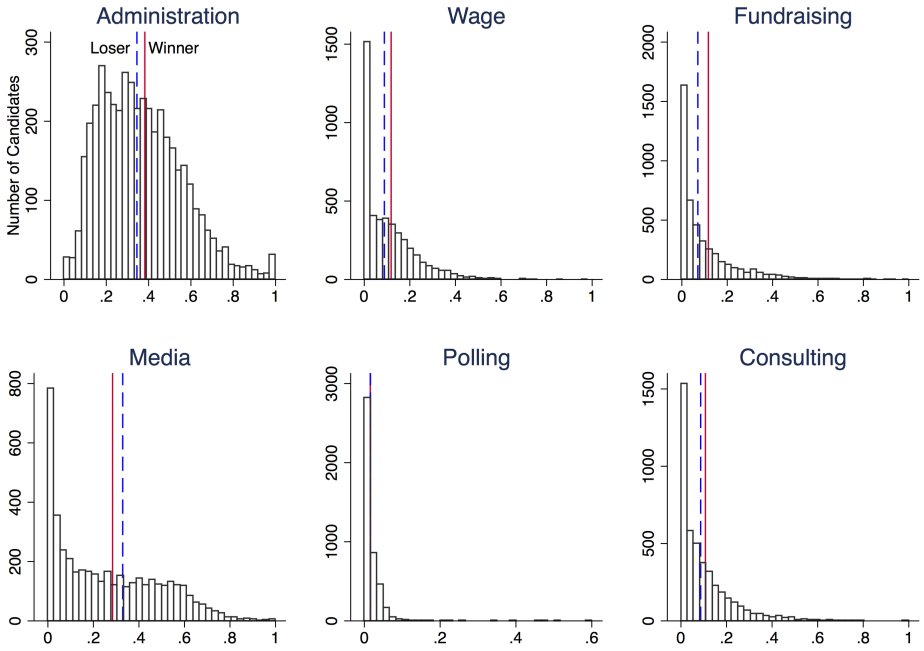
4 Explaining Variations in Campaign Style

In this section, we examine campaign resource allocations at the individual candidate level. While there is little variation in terms of aggregate campaign resource allocations over time, we find that there is significant variation in terms of patterns of campaign expenditures across candidates and across districts. Figure 3 presents the distribution of the expenditure ratios in each category for

[13]The proportion of money spent for wages, fundraising, and polling are stable over the course of the campaign. These ratios are excluded from the graphs for presentational purposes. Figure A3 in Appendix D presents the monthly patterns by each category in terms of total spending - not ratio - and it also shows a very similar pattern over time

4,432 individual campaigns in the sample. While expenditures on wages, fundraising, polling, and consulting show less variation, candidates were quite different in terms of how much of their campaign funds they allocated to administrative and media costs.

Figure 3: Distribution of Expenditure Ratios in Each Category by Campaign



Notes: Vertical solid lines indicate the mean ratios for winners and vertical dashed lines indicate the mean ratios for losers.

What explains this variation in composition of expenditures across campaigns? To systematically investigate which characteristics of candidates and districts are associated with campaign expenditure patterns, we conduct the following OLS analysis for each candidate.

$$y_{ijt} = \beta_1 \mathbf{C}_{ijt} + \beta_2 \mathbf{D}_{ijt} + \beta_3 \mathbf{M}_{ij} + \alpha_t + \varepsilon_{ijt} \tag{1}$$

Let y_{ijt} denote the campaign expenditure patterns - level of spending and ratio of each expenditure type - of legislator i in a district j in election cycle t. $\mathbf{C}_{ijt}$ includes candidate characteristics such as incumbency, party affiliation, and competitiveness of the primary. $\mathbf{D}_{ijt}$ includes congressional district characteristics such as income, educational attainment, and racial heterogeneity. De-

mographic data for congressional districts come from the Decennial Census and American Community Survey.[14] $\mathbf{M}_{ij}$ denotes the media market environment in congressional districts. We use the 'congruence' measure in year 2000 from Snyder and Stromberg (2010). Congruence measures the overlap between a congressional district and newspaper readership and Snyder and Stromberg (2010) show that this measure is highly correlated with the press coverage of a congressional member. To control for time trends, we include election cycle dummy α_t.[15] Table A4 in the Appendix presents the summary statistics for the variables used in the estimation and Table 2 presents the results of estimating equation (1).[16]

Campaigns that spent more tended to allocate more resources for staff wages, media, polling, and consultant expenses. Incumbents tended to spend more on administration, wages, fundraising, and political consultants, and less on media- and polling-related activities. Democrats tended to spend more on wages for campaign employees and hiring consultants, and relatively less on fundraising and media strategies. A competitive primary process - measured by primary vote share - and a competitive district electoral history - measured by Democratic presidential vote share in 2004 (*Swing District*) - are associated with increaed total expenditures and increased emphasis on media strategies and polling. District demographic variables are also associated with campaign expenditure strategies. Candidates running in ethnically diverse (*Ethnic Heterogeneity*) and urban districts (*Urban*) tended to spend more on administrative costs, while spending relatively less on media-related strategies. Districts with more highly educated voters (*Bachelor+*) tended to spend more on wages, while higher income inequality (*Gini*) and unemployment (*Unemployment*) were associated with less spending on staff wages. Candidates who ran in a district where the media market is tightly connected with a congressional district (*Congruence*) spent more on media and

[14] Specifically, we use the 2000 decennial census for the 2004 election, and one-year estimates from the American Community Survey for the 2006, 2008, 2010, 2012, and 2014 elections. Racial heterogeneity is measured by $1-\sum_{i}^{n} r_i^2$, where r_i indicates the ratio of ethnic group i in a district.

[15] Because our main interest in this section is to examine how candidate and district characteristics are associated with different expenditure patterns, we do not include district-fixed or state-fixed effects in the main analysis because it would force us to compare expenditure patterns within district or within state, which reduces variation in district characteristics. Including state-fixed effects produces similar results to those in Table 2.

[16] We present the results considering the ratios of each spending as outcome variables for ease of interpretation. The results are consistent when we use the levels of spending as outcome variables.

Table 2: Explaining Variations across Campaign Expenditures

	(1) Admin.(%)	(2) Wages	(3) Fundraising	(4) Media	(5) Polling	(6) Consultant
(ln) Total Spending	-4.181***	1.000***	-0.682***	4.171***	0.232***	0.829***
	(-16.84)	(8.04)	(-4.50)	(18.11)	(7.47)	(6.21)
Incumbent	10.90***	1.015**	6.102***	-17.63***	-0.447***	-0.0713
	(19.41)	(2.57)	(13.35)	(-27.15)	(-5.35)	(-0.17)
Democrat	-0.616	4.183***	-3.163***	-1.385**	0.107	0.717**
	(-1.19)	(13.03)	(-8.55)	(-2.40)	(1.30)	(2.10)
Competitive Primary[a]	1.835	-4.446***	-1.165	4.396**	0.624**	-1.003
	(1.16)	(-4.58)	(-1.11)	(2.35)	(2.11)	(-0.97)
Swing District[b]	-10.51***	4.161**	-4.424	15.74***	2.955***	-4.632**
	(-2.96)	(2.01)	(-1.57)	(4.23)	(5.55)	(-2.08)
Ethnic Heterogeneity	0.0937***	-0.0387***	0.0419**	-0.0744***	0.00921**	0.00852
	(4.24)	(-2.76)	(2.48)	(-2.90)	(2.52)	(0.55)
Urban	0.109***	-0.0183	0.00215	-0.113***	-0.00144	0.0169
	(5.86)	(-1.60)	(0.18)	(-5.43)	(-0.44)	(1.40)
Senior	0.0448	-0.0647	-0.0384	0.140	0.0591***	0.0126
	(0.44)	(-1.04)	(-0.53)	(1.18)	(2.76)	(0.19)
Bachelor+	-0.131	0.177***	-0.0740	0.0347	0.0199	0.00437
	(-1.74)	(3.45)	(-1.31)	(0.39)	(1.68)	(0.09)
Unemployment	0.550***	-0.214**	-0.0968	-0.301	0.0161	-0.0429
	(3.41)	(-2.14)	(-0.85)	(-1.83)	(0.70)	(-0.44)
(ln) Income per capita	7.479**	-3.594	2.308	-7.013**	-0.682	-1.231
	(2.56)	(-1.83)	(1.07)	(-2.10)	(-1.44)	(-0.64)
Gini	-0.289***	-0.185***	0.100	0.352***	-0.0190	0.0109
	(-2.95)	(-3.18)	(1.34)	(3.30)	(-1.35)	(0.17)
Congruence	-0.0329***	0.00815	-0.0107	0.0432***	0.000968	-0.0132
	(-2.70)	(0.96)	(-1.35)	(2.86)	(0.46)	(-1.54)
Mean Value of Outcome (%)	33.3	9.6	8.8	24.0	1.4	9.1
Election Cycle FE	✓	✓	✓	✓	✓	✓
N	4050	4050	4050	4050	4050	4050
adj. R^2	0.233	0.107	0.084	0.268	0.039	0.065

Notes: Unit of observation = candidate × cycle. t statistics in parentheses. $^{**}p < 0.05$, $^{***}p < 0.01$. Standard errors are clustered at district level. **a**. 1 - |0.5 - primary vote share|. **b**. 1 - |0.5 - Democratic Presidential Vote Share 2004|.

less on administrative costs.

Table A6 in the Appendix presents the results when we restrict the analysis to incumbents. Politicians in leadership positions spend more money for fundraising and less for media spending. Incumbents who had higher vote shares in the previous election tend to spend less on media and more on administrative costs.[17] As their seniority increases, politicians spend more on administrative costs and staff wages and spend less on fundraising, polling, and political consulting. Female incumbents allocate more resources for polling and minority candidates spend less of their campaign resources on wages.

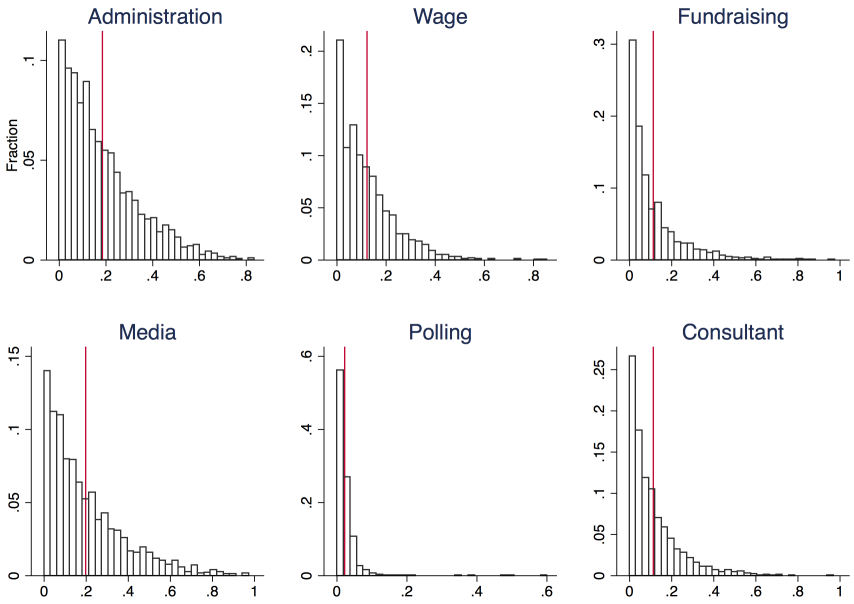
Although we document that there is significant variation across candidates in terms of resource allocations, candidates who run in the same district may employ similar allocation strategies. Indeed, scholars argue that there is little variation in how campaigns allocate their budgets (Herrnson 2012). We examine this claim using the rich campaign expenditure dataset to calculate the difference in the ratio for each expenditure type within each race between the two candidates.[18] The distribution of the differences gives a sense of the degree of similarity or difference in campaign strategies employed by candidates within the same race. Figure 4 presents the results. A distribution value centered near 0 means candidates within the same race employed similar allocation strategies; a distribution that is spread out indicates significant variations in campaign strategies within the same race.

Candidates who ran in the same district in the same year can be quite different in terms of campaign resource allocations. For example, there is an average difference of 19.7% between candidates in the same race regarding the ratio of their media expenditures. Even the average difference in the ratio of administrative costs, which captures the basic operations of a campaign, is 18%. What is more interesting is the significant variation in the convergence of candidates' strategies across races. Despite the fact that we compare candidates' strategies within each race, the puzzle of why some races have similar strategies while other races display starkly different

[17] Incumbents are coded as *leadership* if they serve in one of the following roles: the Speaker, majority leader, minority leader, or committee chair.

[18] We exclude unopposed races for this analysis.

Figure 4: Distribution of Differences in Expenditure Ratios Between Candidates at the Race Level



Notes: X-axis indicates the difference in ratio between two candidates within the same race. A vertical line in each graph indicates the mean difference in each ratio. Y-axis indicates fraction of races in each distribution.

strategies remains. To begin to unpack this riddle we run the regression of the differences in expenditure ratios between candidates on characteristics of elections and congressional districts. To capture race-specific characteristics, we include a dummy variable for an open-seat race and the measure of the competitiveness of the race. We calculate the difference in vote percentage of two candidates in the general election and subtract it from 1 (*Competitiveness*). We also include the same set of district-level demographic variables as before. Table 3 presents the results.

Candidates who ran in an open-seat race tended to have similar strategies in terms of resource allocations across different campaigning activities. This is particularly true for the ratio of expenditures on staff wages and fundraising activities. The most consistent variable that affects convergence or divergence in campaign strategies is the competitiveness of the race. More competitive races tended to increase the convergence in candidates' decisions about how much to spend on administration, wages, fundraising, media, and political consultants. As races become competitive, candidates may imitate each other's strategies or candidates may feel that they possess less discre-

Table 3: Explaining Divergence Between Candidates in the Same Race

	(1) Admin.	(2) Wages	(3) Fundraising	(4) Media	(5) Polling	(6) Consultants
Open Seat	-0.00355	-0.0202***	-0.0216**	-0.00621	0.00194	-0.00389
	(-0.36)	(-2.87)	(-2.30)	(-0.54)	(0.64)	(-0.47)
Competitiveness[a]	-0.337***	-0.108***	-0.180***	-0.113***	0.0101	-0.0785***
	(-10.39)	(-4.53)	(-6.32)	(-3.16)	(1.47)	(-3.20)
State FE	✓	✓	✓	✓	✓	✓
Election Cycle FE	✓	✓	✓	✓	✓	✓
Demographic Control	✓	✓	✓	✓	✓	✓
N	1837	1837	1837	1837	1837	1837
adj. R^2	0.136	0.057	0.080	0.017	0.022	0.058

Notes: t statistics in parentheses. $^{**}p < 0.05$, $^{***}p < 0.01$. Dependent variables are the difference in the ratio of allocation in each category of spending between two candidates in the same race. **a**. 1 - Vote percent difference between two candidates in a general election, which ranges from 0.19 to 0.9996. Unit of observation is each congressional race where two candidates ran for office. Standard errors are clustered at the congressional district level.

tion in terms of resource allocations. Moreover, imitation provides security in that an innovative strategy that results in a loss cannot be scapegoated. Changes in districts' demographic variables, such as ethnic composition and income levels, are not systematically related to the variation of differences in candidates' strategies.

5 Electoral Dynamics and Updating in Campaigns

Next, we examine how much updating of campaign strategies takes place within each candidate's campaign. The panel data structure of campaign expenditures allows us to compare the expenditure ratio for each type of campaign activity between elections for the same candidate. We construct a lagged expenditure ratio for each type at the candidate level and examine their relationships. To be included in this sample, a candidate had to run more than once; therefore, most of the candidates in this sample are incumbents (89%).[19] We investigate under which conditions candidates update their strategies for campaign resource allocations. Specifically, we focus on three conditions: changes in the identity and the quality of the challenger, changes in the partisan leaning of a

[19]Figure A4 presents the relationship of expenditure ratios in each category between an election at $t-1$ (X-axis) and at t (Y-axis). A lagged spending ratio in each category shows a tight relationship with the current spending ratio.

district, and the percent change in the composition of a district due to redistricting.

First, most incumbents who run for re-election face new challengers, but there are cases where incumbents face the same challenger as they did in their last election. Among 1,684 races in which incumbents ran for re-election during 2004 and 2014, incumbents faced new challengers in 93.3% cases and they faced the same challenger from their last elections in 6.7% of the races. We examine whether incumbents changed their allocations of campaign resources more when they faced new challengers compared to a situation when they faced the same challengers between elections. We calculate the absolute difference in ratios from election cycle *t* and *t-1* in each category for each candidate. Panel A in Table 4 presents the results. When candidates are faced new challengers, candidates changed their allocation of media expenditures but did not change other categories systematically. When we investigate the directionality of media expenditures (not the absolute changes), there is no systematic pattern.

Whether an incumbent faces a new challenger may not fully capture the degree of electoral shock experienced by the incumbents. To capture the quality of challengers across different elections, we use the campaign contributions that challengers raised and use it as a proxy for a challenger's quality (Green and Krasno 1988). For each incumbent who appeared at least twice in our data, we calculate the difference in the total contributions raised by the challenger in election *t* from the challenger in a previous election. Panel B in Table 4 presents the results. Decisions to allocate campaign resources does not vary depending on the challenger's ability to raise money. As a robustness check, we also use Jacobson's measure of challenger quality which assumes that a challenger is high quality if the challenger has previous experience holding office (Jacobson 2009). Table A7 in the Appendix presents the results. Changes in the quality of challengers do not affect the allocation decisions of incumbents.[20]

Next, we investigate whether candidates respond to changes in the partisan leaning of a district. To measure changes in the partisan leaning of a given district, we use *Cook Political Report's* partisan index.[21] The Cook report classifies congressional races into one of seven categories from

[20] We thank Pamela Ban for sharing the challenger quality data.

[21] We thank Gregory Martin for sharing the data.

Solid Republican to Solid Democratic (Martin and Peskowitz 2015). Based on this measure, we calculate the absolute value of changes in the Cook partisan index from the previous election cycle to the current election cycle (*Partisan Index Change*). In our data, 75.7% of the congressional districts did not experience any change in the Cook's rating but some districts experienced substantial changes in terms of partisan ratings.[22] Panel C in Table 4 presents the results. Changes in partisan index between elections do not seem to change the allocation of campaign resources within candidates.

Finally, we investigate whether changes in the compositions of groups of voters influences candidates' decisions about their allocations of campaign resources. Redistricting presents an interesting case since changes in the composition of voter pools from election t to $t+1$ can vary significantly across incumbent candidates (e.g., Gelman and King 1994; Ansolabehere, Snyder, and Stewart 2000). For example, candidates who ran in "at-large" districts, such as Alaska and Wyoming, did not face significant changes in voter configurations in the 2012 election after redistricting. However, candidates like Rick Larsen (D-WA2), who ran for the 2nd district in the state of Washington in both 2010 and 2012, faced a new district in 2012 that included only 15% of his district from the 2010 election.[23]

We use data from the Missouri Census Data Center's Geographic Correspondence Engine and calculate the change in the boundaries of a district induced by redistricting in 2012.[24] We examine whether candidates who ran in a district that experienced more changes due to redistricting were more likely to change the allocations of their campaign resources from the 2010 to the 2012 election cycle due to potential changes in the composition of voters. Changes in geography in congressional districts induced by redistricting might not capture the electoral shocks that candidates face if new voters in a new district are quite similar to old voters in the district before redistricting.

[22]The unit of analysis is district $\times$ cycle. 12.5% became more Democratic-leaning and 11.8% became more Republican-leaning.

[23]Figure A5 in the Appendix presents the distribution of changes in districts produced by redistricting in 2012. The *Change by Redistricting* variable measures 1- the percent of the land that remains in the member's new district. So, in the examples above,15 percent of the land Rick Larsen represented in 2012 was in his district in 2010. Therefore, the *Change by Redistricting* variable for Rick Larsen in the 2012 cycle would be 0.85.

[24]http://mcdc.missouri.edu/websas/geocorr14.html.

To address this concern, we run the regression between the absolute changes in Democratic presidential vote share between 2008 and 2012 and the ratio of district changes due to redistricting. Districts that underwent more significant changes in geography show more changes in presidential vote share.[25]

Panel D in Table 4 presents the result. Candidates who faced larger changes in their districts' compositions due to redistricting in the 2012 election cycle did not show any difference in terms of changes in allocations of their resources than candidates who faced small changes in their districts' compositions.

Table 4: Changes in Challengers, Redistricting, and Campaign Resource Allocations

DV = Change in Allocation	Δ Admin.(%)	Δ Wages	Δ Fundraising	Δ Media	Δ Polling	Δ Consultants
Panel A						
New Challenger	0.131	0.202	1.842	4.335***	0.293	1.001
	(0.11)	(0.28)	(1.59)	(2.72)	(1.44)	(1.25)
N	1715	1715	1715	1715	1715	1715
adj. R^2	0.195	0.284	0.302	0.296	0.263	0.298
Panel B						
Difference in Challenger	-0.173	0.123	-0.0676	-0.394	-0.00148	0.395
Contributions ($M)	(-0.43)	(0.51)	(-0.22)	(-0.56)	(-0.03)	(1.46)
N	1302	1302	1302	1302	1302	1302
adj. R^2	0.213	0.310	0.301	0.222	0.327	0.311
Panel C						
Partisan Index Change	0.431	0.166	0.246	0.833	-0.00249	0.223
	(1.06)	(0.78)	(1.07)	(1.36)	(-0.06)	(0.84)
N	1937	1937	1937	1937	1937	1937
adj. R^2	0.304	0.320	0.376	0.280	0.337	0.383
Panel D						
Change by Redistricting	3.234	-0.0309	0.865	2.437	0.0400	0.193
	(1.40)	(-0.02)	(0.33)	(0.73)	(0.10)	(0.10)
N	332	332	332	332	332	332
adj. R^2	0.011	0.009	0.040	0.031	-0.001	0.004

Notes: *t* statistics in parentheses. $^{**}p < 0.05$, $^{***}p < 0.01$. Dependent variables are the absolute difference in the ratio in each category between *t-1* and *t*. Standard errors are clustered at candidate level. Regression results reported in Panels A, B, and C include candidate and election cycle fixed effects. All regression results include demographic controls.

[25] *t-statistics* for the bivariate regression is 4.35 (with a coefficient of 0.058 and a standard error of 0.013) . Figure A6 in the Appendix shows the distribution of absolute changes in Democratic presidential vote shares between 2008 and 2012 in a given district.

6 Outside Spending and Updating in Campaigns

Perhaps the most striking aspect observable from the monthly campaign spending patterns presented in Figures 1 and 2 is that the average campaign used very similar strategies across six election cycles. That campaigns employed similar spending patterns over several election cycles is particularly interesting considering the changes in independent spending by organizations and wealthy individuals after the *Citizens United* decision by the Supreme Court in 2010. The Supreme Court decision of *Citizens United v. Federal Election Commission* in 2010 struck down campaign finance laws that prevented corporations and unions from using their treasuries to sponsor electioneering activities during campaigns (Kang 2010, 2012). After the decision, "Super PACs" - organizations that may only engage in independent expenditures and are not allowed to coordinate with candidates - formed rapidly (Briffault 2012). Although Super PACs are not allowed to coordinate with a candidate, there were many single-candidate Super PACs dedicated to electing specific individual candidates (Briffault 2013). Total independent spending in House races increased from $37.9 million in 2004 to $290 million in 2014 (Jacobson (2015b)).

Given that outside groups buy media slots for political advertisements, contract with polling firms, and hire campaign consultants, their electioneering activities could still *subsidize* spending by campaigns and thus alter the allocation strategies of candidates. Although a noticeable time trend after the *Citizens United* decision in 2010 is not shown in the aggregate level analysis from the previous section, individual candidates who ran in districts where outside groups heavily invested may have updated their campaign strategies. In this section, we examine how the increase in outside spending affected campaign strategies.

We use data on outside groups' spending in each House race between 2004 and 2014 from the FEC.[26] There are 66,682 records of independent expenditures spent on House races from 2004 to 2014. Data indicate how much outside groups spent to support or oppose a Democratic (Re-

[26]We use `http://classic.fec.gov/finance/disclosure/ftpdet.shtml` to obtain spending by outside groups for the 2010, 2012, and 2014 cycles. We use https://www.fec.gov/data/independent-expenditures/ with an adjusted date filter to obtain expenditures for the 2004, 2006, and 2008 cycles.

publican) candidate in each race.[27] We use the same categorization scheme for expenditures by outside groups that we used for expenditures by candidates to compare the allocation of campaign resources among candidates and non-candidate groups. Summary statistics for outside groups' spending is presented in Table A5 in Appendix C. Outside spending to oppose specific candidates dramatically increased in the 2010 election, the first election cycle after *Citizens United*, and there is no distinct pattern among candidates by incumbency status or party affiliation in terms of outside spending. The majority of outside spending was used for media-related expenditures and this pattern intensified after *Citizens United*.

Although formal coordination between outside groups and candidates is prohibited, it is well known that campaign personnel move freely between candidates' campaigns and outside organizations (Briffault 2013; Ferguson 2015). Moreover, candidates compete for airspace with these outside groups and should be able to intuit if considerable outside spending is taking place in their races. Given that total outside spending rapidly increased after the Supreme Court's decision in 201 - which suggests that incumbents' spending advantages were diminished due to outside groups' support for their challengers - it is possible that candidates would adjust their allocations of campaign resources in this changed environment. Also, given that outside groups heavily spend on media, candidates may update their allocation strategies in specific categories of campaign expenditures that could affect their overall resource allocation strategies. We examine how outside groups' spending influences the candidate's campaign resource allocations.

Table 5 presents the results of the regression of candidates' campaign strategies on outside groups' strategies. Dependent variables are the ratio of campaign funds spent on each category of activities. A variable, *(ln) Candidate Spending*, indicates the total spending by candidates. Other variables, *(ln) Outside For* and *(ln) Outside Against*, indicate the log-transformed total spending by outside groups to support and oppose candidates, respectively. A variable, *Post CU*, indicates

[27] Outside groups are divided into party organizations, such as the Senate Majority PAC, and non-party organizations such as American Crossroads. The data also divides the outside spending by party and non-party organizations; therefore, we are able to calculate total outside groups' spending from party and non-party organizations. In the main analysis, we combine all outside spending by party and non-party organizations. The results are similar if we only use outside spending by non-party organizations.

election cycles after the *Citizens United* decision and is defined as 1 if the election cycle is 2012 or 2014.[28] We include interaction terms to see whether there is any heterogeneous effect of outside spending on campaign strategies by incumbency status and any time trend after the *Citizens United* decision. Other control variables such as primary competitiveness, general election vote percentage, and incumbency status are also included in the regression analysis but the results are not reported to simplify the presentation. We also include a candidate and an election cycle fixed effects to control candidate-specific heterogeneity and time trends.[29]

Incumbents tended to increase the proportion of their resources allocated to the media when outside groups spent money to support them. This may have been driven by the competitiveness of the race. Incumbents tended to spend more on media when they were in tight competitions and outside groups tended to spend money in competitive races. But overall, both outside spending to support or to oppose candidates did not significantly affect campaigns' resource allocations. The most striking result is no effect in the interaction term between outside spending and the post *Citizens United* decision on campaign strategies. This is true for all types of outside spending. Despite exponential increases in the number of Super PACs and their more active roles in electoral competitions after the *Citizens United* ruling, especially in media campaigns, the results suggest that the effect of outside groups' spending after 2010 is not different from the effect of spending by outside groups before the Supreme Court decision. This is consistent with the previous figures that show remarkably stable patterns of campaign strategies across six different electoral cycles. Despite a sea change in the electoral landscape, updating of campaign strategies did not happen.

[28]The *Citizens United* decision was made in January 2010. We did not treat the 2010 election cycle as *Post CU* since the decision was made in the middle of the election cycle. However, even if we include the 2010 election cycle in the *Post CU* variable, the results are similar.

[29]We also ran the analysis with the total spending as dependent variables instead of ratios in each category. The results are very similar.

Table 5: Outside Spending and Candidates' Campaign Strategies

DV = Ratio	(1) Admin.	(2) Wages	(3) Fundraising	(4) Media	(5) Polling	(6) Consultants
(ln) Candidate Spending	-0.0579***	-0.0168***	-0.0207***	0.114***	0.00426***	-0.0125
	(-5.86)	(-3.04)	(-2.88)	(11.29)	(3.89)	(-1.72)
(ln) Outside For	0.000374	-0.000397	0.00147	-0.000462	-0.000233	-0.000311
	(0.17)	(-0.29)	(0.74)	(-0.17)	(-0.72)	(-0.17)
(ln) Outside Against	-0.00110	0.000297	0.00164	-0.000408	-0.0000397	0.000849
	(-0.54)	(0.24)	(0.84)	(-0.14)	(-0.13)	(0.38)
(ln) Outside For × Incumbent	-0.00254	-0.000214	-0.00397	0.00721**	0.0000280	-0.000287
	(-0.98)	(-0.14)	(-1.89)	(2.13)	(0.07)	(-0.14)
(ln) Outside For × Post CU	0.00489	0.000322	-0.00267	-0.00468	0.000294	0.000160
	(1.07)	(0.09)	(-0.56)	(-0.74)	(0.48)	(0.04)
(ln) Outside For × Incumbent × Post CU	-0.00500	-0.0000654	0.00479	0.00181	0.000254	-0.000740
	(-0.96)	(-0.02)	(0.93)	(0.26)	(0.34)	(-0.15)
(ln) Outside Against × Incumbent	0.00203	0.000235	-0.000109	-0.000434	-0.0000401	-0.00186
	(0.66)	(0.08)	(-0.03)	(-0.08)	(-0.07)	(-0.44)
(ln) Outside Against × Post CU	-0.00407	-0.00117	-0.00264	0.00697	0.000493	-0.00112
	(-1.68)	(-0.68)	(-1.19)	(1.93)	(1.42)	(-0.46)
(ln) Outside Against × Incumbent × Post CU	0.00000437	-0.000111	-0.000432	-0.000231	-0.000574	0.00166
	(0.00)	(-0.03)	(-0.12)	(-0.04)	(-0.94)	(0.37)
Controls	✓	✓	✓	✓	✓	✓
Candidate FE	✓	✓	✓	✓	✓	✓
Election Cycle FE	✓	✓	✓	✓	✓	✓
N	4050	4050	4050	4050	4050	4050
adj. R^2	0.692	0.626	0.527	0.709	0.693	0.473

Notes: t statistics in parentheses. $^{**}p < 0.05$, $^{***}p < 0.01$. Standard errors are clustered at candidate level.

7 Potential Mechanisms for Persistency in Campaign Resource Allocations

Why do we observe persistency in campaign resource allocations? As noted in the previous sections, candidates' risk-aversion to adopt new strategies and profound uncertainties about voters or the optimal allocation of campaign resources may explain the pattern (e.g., Kingdon 1968; Ferejohn and Noll 1978; Jacobson 2009). In this section, we present two other potential mechanisms that explain the lack of updating in campaign resource allocations. The first mechanism is the con-

tractual relationship with political consultants. Modern electoral campaigns are increasingly run by political consultants (Sheingate 2016) who help candidates organize their campaigns and help spread ideas and campaign strategies across candidates (Nyhan and Montgomery 2015). Therefore, hiring the same set of consulting firms could contribute to persistency in campaign resource allocation strategies.

To examine the contractual relationships between candidates and consulting firms, we construct a dataset containing the name of each firm that received any consulting fees from any candidate in a given election cycle. In total, there were 1,385 firms that worked for candidates who ran for House races between 2004 and 2014. For each firm, we calculate the total expenditures that a firm received from each candidate in each electoral cycle. In total, there are 11,109 contractual relationships between candidates and consulting firms. On average, candidates hired five consulting firms and firms worked for three candidates in a given cycle, although more than 50% of the firms worked exclusively for one candidate.

To examine the over-time contractual relationship between a candidate and a consulting firm, we calculate how many electoral cycles a candidate appears in the data (α_i) and calculate how many electoral cycles a consulting firm worked for that candidate (β_{ij}). We define $\textit{Contract Ratio}_{ij} = \frac{\beta_{ij}}{\alpha_i}$. If a candidate i ran four times during 2004 and 2014 and a firm j worked for a candidate i for four times, $\textit{Contract Ratio}_{ij}$ would take a value of 1. The average $\textit{Contract Ratio}_{ij}$ for candidates who ran in more than one election in the data (N = 2,690) is 0.67, which means that 67% of firms that were hired by a candidate worked for the candidate in every election cycle in which the candidate appeared. If we focus on the consulting firm that collected the highest revenue from each candidate and their contractual relationship, $\textit{Contract Ratio}_{ij}$ is even higher (0.71 on average).

Table 6 presents the results on the relationship between the revenues from a previous election and the revenues from the current election in a given pair of a candidate-firm. Column (1) presents the results when we focus on firms that had the highest revenue from a candidate in each election cycle, which presumably means they played the most important role in terms of designing campaign strategies. Within the candidate-firm pair, firms retain about 77% of their previous-period

share from candidates. Columns (2) and (3) present the results when we include all firms and the results suggest that firms retain a significant portion of their previous-period share.

Table 6: Persistency in Contracts between Candidates and Consulting Firms

$DV = Revenue_t$	(1)	(2)	(3)
Revenue_{t-1}	0.769***	0.603***	0.571***
	(15.01)	(10.35)	(9.03)
Incumbent	-76687.4	-7623.0	-46895.0
	(-1.34)	(-0.61)	(-1.46)
Democrat	-22830.8	-6214.5	-25215.6
	(-1.00)	(-0.75)	(-0.67)
Election Cycle FE	✓	✓	✓
Candidate FE			✓
N	1373	6656	6656
adj. R^2	0.433	0.356	0.376

Notes: t statistics in parentheses. $^{**}p < 0.05$, $^{***}p < 0.01$. Unit of observation is candidate × firm × cycle. Standard errors are clustered at the firm level.

Consistent with Martin and Peskowitz (2015), who find that consulting firm-candidate relationships persist regardless of changes in the candidate's electoral conditions, our findings suggest that there is a long-term relationship between candidates and consulting firms. Firms providing the same advice could lead to the observed lack of updating.

The second potential mechanism that could explain persistency in the allocation of resources across campaigns is that many of the vendors (e.g., flowers shops, hotels, and restaurants) that have transactions with campaigns are located in candidates' own districts and employees of those vendors are likely to be members' constituents. Therefore, once a relationship is established, it may be difficult to change the contract and the long-term contracts with vendors may contribute to persistency in campaigns. To investigate this possibility, we construct a dataset that includes information on transactions between candidates and vendors in each election cycle. The FEC data on campaign expenditures includes geographic information on where the transaction with a vendor took place and we use the state and zip code information of vendors to see whether they were located in the same district as the candidates with whom they had transactions. To

match a zip code to a congressional district, we use the Census' Congressional Districts by Zip Code Tabulation Areas (ZCTAs) data.[30] Some zip codes are matched with multiple congressional districts and in those cases we assume that a zip code represents multiple districts. We merge this zip code-congressional district file with the file that includes candidate-vendor information. Then we calculate if a vendor is located in the same state and district as a candidate with whom the vendor had transactions.

Based on the indicators of same-state or same-district vendors, we calculate the ratio of total expenditures spent on same-state vendors and same-district vendors for each candidate in each election cycle. Figure A7 in the Appendix presents the results. On average, 57% of the total expenditures was spent on vendors who were located in the same state and 30% was spent on vendors who were located in the same district where the candidates ran for office. We also find that vendors retain 63% of their previous-period revenues from the same candidate. This renewing relationship between vendors and candidates across multiple election cycles may contribute to the persistency of the allocation of campaign resources.

8 Conclusion

Campaigns are at the heart of electoral competition. Despite mounting attention to campaign dynamics in every election year, we know little about how candidates allocate their resources across different electioneering activities. Using data on 3.5 million expenditure items submitted by candidates who ran for House races between 2004 and 2014, we provide a detailed picture of how candidates allocated their limited resources among different categories of activities. Contrary to conventional wisdom, we find that candidates were quite different in their campaign resource allocations, even candidates who ran in the same race.

However, it seems that candidates have their own campaign style and they rarely update their allocation decisions regardless of electoral conditions. Allocation of spending looks remarkably similar over the course of six election cycles. We find that candidates who face new types of

[30] https://www.census.gov/geo/maps-data/data/cd_state.html

challengers, more changes in the partisan leaning of a district, or significant redistricting are not more likely to change their allocations of resources compared to candidates who faced the same challengers from their previous election and experienced little redistricting. We also find that candidates rarely updated their strategies in response to the rise of outside spending, especially after the *Citizens United* decision by the Supreme Court in 2010, which was expected to bring a sea change in electoral campaigns. Even in an era when the Internet penetrates society and Supreme Court decisions alter the landscape of campaign election law, candidates seemed to make few changes in their allocation strategies and overall levels of spending.

One caveat is the possibility that even though campaigns are remarkably consistent in the allocation of their resources, they might change the contents of their campaign messages (Druckman, Kifer, and Parkin 2009; Sulkin 2009). For example, when outside groups on behalf of candidates spend copious amounts of money to air negative attack ads against their challengers, the candidates may air more positive ads without changing the allocation of their campaign resources devoted to the media. The lack of comprehensive data on campaign contents across different activities does not allow us to systematically investigate this possibility. Combining the content of campaigns with our current analysis would be a fruitful extension to provide more accurate information about the nature of updating in campaigns.

Another natural extension of this study for the future is to connect the allocation of campaign resources with electoral outcomes. Since the decision to allocate resources on certain types of expenditures is not random, establishing a causal link between the allocation of campaign resources and electoral outcomes will be challenging. However, if there were a formula for an optimal allocation of resources to maximize winning - given the variables of district characteristics, challenger quality, and outside spending - and candidates rarely update their resource allocations despite the changes in those variables, it implies that some candidates misallocate their resources more than other candidates. By incorporating allocation decisions into the equation, this analysis would provide a tighter mapping between campaign spending and electoral outcomes.

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A Appendix: FEC Disbursement Filing Example

The two images below, referenced in the text, provide the actual file images on record with the FEC. A typical page contains three such expenditures. This means that over 1 million pages of campaign expenditures exist for the six election cycles in question for House races alone (and highlights the difficulties involved with converting paper documents into electronic format). While both transactions occur in the same election cycle, the overall quality and clarity of each varies as campaigns opted to report expenditures using different methods. These differences subside over time as technology improved.

Figure A1: Nancy Pelosi (D-CA08), 2006

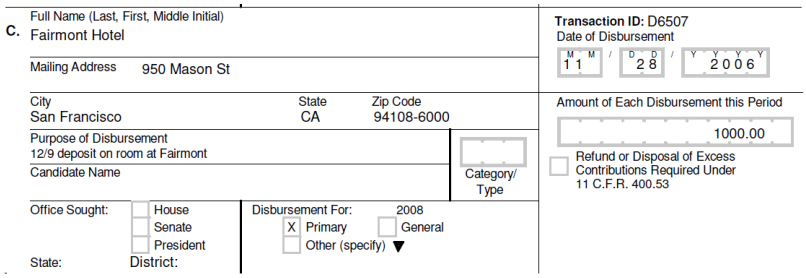
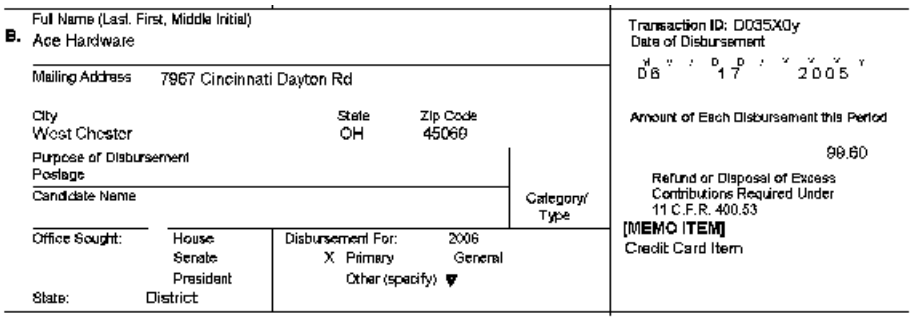

C.
Full Name (Last, First, Middle Initial)
Fairmont Hotel
Mailing Address 950 Mason St
City San Francisco
State CA
Zip Code 94108-6000
Purpose of Disbursement
12/9 deposit on room at Fairmont
Candidate Name
Category/ Type
Office Sought: House Senate President
State: District:
Disbursement For: 2008
X Primary General
Other (specify)
Transaction ID: D6507
Date of Disbursement
11 / 28 / 2006
Amount of Each Disbursement this Period
1000.00
Refund or Disposal of Excess Contributions Required Under 11 C.F.R. 400.53

Figure A2: John Boehner (R-OH07), 2005


B.
Full Name (Last, First, Middle Initial)
Ace Hardware
Mailing Address 7967 Cincinnati Dayton Rd
City West Chester
State OH
Zip Code 45069
Purpose of Disbursement
Postage
Candidate Name
Category/ Type
Office Sought: House Senate President
State: District
Disbursement For: 2006
X Primary General
Other (specify)
Transaction ID: D035X0y
Date of Disbursement
08 / 17 / 2005
Amount of Each Disbursement this Period
99.60
Refund or Disposal of Excess Contributions Required Under 11 C.F.R. 400.53
[MEMO ITEM]
Credit Card Item

B Appendix: Categorization Process

Every listing by the FEC includes a stated purpose for the expenditure that gives us insight about its type. We created indicator variables for if a purpose contained a keyword or phrase that indicated the type of expenditure. Administrative tasks included rent, supplies, food, banking, postage, and other office-related expenses. Any payments for wages, salary, or payroll were classified in the wages category. All media - television, radio, print, digital, etc. - were placed in the media category. Expenditures indicating polling or that a poll was conducted were placed in the polling category. Expenditures indicating the use of a consultant or the purchase of a list of some sort were placed in the consulting category. Finally, all expenditures indicating fundraising activities were placed in the fundraising category.

Additionally, FEC categories provided in the expenditure file were used to place disbursements that were not classifiable using our coding scheme. We used these categories only when over 500 keywords did not place the expenditure. Finally, vendors that clearly fell into one type of expenditure were used to place the remaining unclassified payments. Vendors such as Walgreens, Target, or Sprint clearly fit under administrative expenditures. Any vendor containing "airline" clearly fit under travel, and thus administration. Finally, contributors such as "Political Data" or "Political Calling" were placed under consultants. Considering all three methods of classification, over 600 keywords were used to place expenditures in a particular category.

C Appendix: Tables

Table A1: Number of Races and Candidates in the Sample

Election Cycle	No. Races	No. Candidates
2004	425	648
2006	429	746
2008	428	738
2010	431	789
2012	432	771
2014	430	740
Total	2,575	4,432

Table A2: Summary Statistics of Campaign Expenditures

Variable	N	Mean	Median	SD	Min	Max
Panel A: Candidate Level						
Total Spending ($)	4432	1,069,152	753,029	1,228,766	8.19	23,071,306
Administration	4432	.36	.34	.19	0	1
Wage	4432	.10	.07	.11	0	0.98
Fundraising	4432	.09	.04	.12	0	1
Media	4432	.26	.21	.22	0	1
Polling	4432	.01	.001	0.02	0	.60
Consultant	4432	.09	.06	0.11	0	1
Panel B: Race Level						
Total Spending ($)	2575	1,840,613	1,128,991	1,958,385	181.85	24,821,760
Administration	2575	.37	.36	.16	.05	1
Wage	2575	.10	.09	.08	0	.61
Fundraising	2575	.10	.07	.11	0	.71
Media	2575	.24	.21	.19	0	.77
Polling	2575	.01	.01	.02	0	.30
Consultant	2575	.10	.07	.09	0	.57

Table A3: Average Expenditure Patterns among House Candidates 2004 - 2014

Cycle	N[a]	Total($K)[b]	Admin.	Wage	Fundraising	Media	Polling	Consulting
Panel A: Total								
2004	648	963	.37	.11	.10	.24	.01	.08
2006	746	1,063	.37	.10	.09	.26	.01	.07
2008	738	1,090	.37	.10	.09	.26	.01	.08
2010	789	1,133	.34	.10	.09	.29	.01	.09
2012	771	1,124	.36	.10	.09	.26	.01	.11
2014	740	1,020	.35	.10	.10	.24	.01	.13
Panel B: Incumbent								
2004	390	1,095	.42	.11	.11	.18	.01	.08
2006	395	1,278	.40	.11	.12	.20	.01	.08
2008	387	1,291	.40	.12	.13	.19	.01	.08
2010	388	1,478	.37	.12	.11	.22	.01	.10
2012	372	1,533	.37	.11	.12	.20	.01	.12
2014	380	1,318	.38	.11	.13	.17	.01	.15
Panel C: Non-Incumbent								
2004	258	763	.30	.10	.08	.34	.02	.08
2006	351	822	.34	.08	.06	.33	.01	.07
2008	351	868	.35	.08	.06	.33	.01	.07
2010	401	800	.32	.09	.06	.35	.01	.08
2012	399	743	.35	.09	.05	.32	.01	.10
2014	360	706	.33	.09	.07	.31	.01	.11
Panel D: Democrats								
2004	324	864	.38	.11	.09	.23	.01	.09
2006	403	875	.38	.11	.09	.24	.01	.08
2008	403	1,059	.38	.12	.08	.24	.01	.08
2010	384	1,239	.35	.12	.07	.28	.01	.09
2012	382	998	.37	.13	.06	.24	.01	.11
2014	372	903	.35	.14	.08	.22	.01	.12
Panel E: Republicans								
2004	324	1,062	.37	.10	.11	.25	.01	.07
2006	343	1,284	.36	.09	.10	.28	.01	.07
2008	335	1,126	.36	.08	.11	.28	.01	.07
2010	405	1,033	.34	.08	.11	.29	.01	.09
2012	389	1,248	.35	.07	.11	.28	.01	.11
2014	368	1,139	.36	.06	.11	.26	.01	.13

Notes: a. Total number of candidates in each cycle in each category. b. Total expenditures in thousand US dollars (2014 dollar terms).

Table A4: Summary Statistics of the Variables

Variable	Obs.	Mean	Std.Dev.	Min.	Max.
Administration	4,432	33.37	17.78	0	100
Wage	4,432	9.61	10.44	0	95.19
Fundraising	4,432	8.88	11.91	0	100
Media	4,432	24.03	20.63	0	97.09
Polling	4,432	1.44	2.61	0	54.64
Consultant	4,432	9.10	10.98	0	90.91
(ln) Total Spending	4,432	13.04	1.71	2.10	16.95
Incumbent	4,432	0.52	0.50	0	1
Democrat	4,432	0.51	0.50	0	1
Competitive Primary	4,432	0.64	0.18	0.50	1
Swing District	4,390	0.89	0.09	0.55	1
Ethnic Heterogeneity	4,432	35.97	16.46	4.62	75.16
Urban	4,432	79.21	19.47	21.33	100
Senior	4,432	13.11	3.08	5.34	32.84
Bachelor+	4,432	27.60	9.86	6.10	71.75
Unemployment	4,432	7.75	2.96	2.42	25.95
(ln) Income per capita	4,432	10.18	0.26	9.34	11.25
Gini	4,432	44.88	3.17	36.50	60.60
Congruence	4,050	17.89	20.47	0.14	100

Table A5: Summary Statistics of Spending by Outside Groups (Average by Candidate)

Cycle	N	Candidate Spending ($K)	Outside Spending For Candidate ($K)	Outside Spending Against Candidate	Outside Spending Media Ratio
Panel A: All Candidates					
2004	648	963	30.4	32	0.60
2006	746	1,063	10.6	9,5	0.32
2008	738	1,090	27.1	8.9	0.45
2010	789	1,133	16.5	139.7	0.74
2012	771	1,124	25.5	193.6	0.76
2014	740	1,020	30.2	194.1	0.72
Panel B: By Incumbency					
2004 (I)	390	1,095	9.5	19	0.58
2006 (I)	395	1,278	6.8	15.1	0.30
2008 (I)	387	1,291	14.5	15.7	0.37
2010 (I)	388	1,478	16.2	124.5	0.67
2012 (I)	372	1,533	27.0	174.4	0.78
2014 (I)	380	1,318	27.5	147.8	0.65
2004 (NI)	258	763	61.9	53.7	0.63
2006 (NI)	351	822	14.8	3.2	0.34
2008 (NI)	351	868	41.0	1.5	0.60
2010 (NI)	401	800	16.8	154.4	0.80
2012 (NI)	399	743	241.1	211.4	0.73
2014 (NI)	360	706	33.0	243.0	0.78
Panel C: By Party					
2004 (D)	324	864	47.4	44.0	0.64
2006 (D)	403	875	10.0	10.1	0.18
2008 (D)	403	1,059	43.9	11.1	0.29
2010 (D)	384	1,239	15.7	152.5	0.67
2012 (D)	382	998	17.8	259.5	0.63
2014 (D)	372	903	17.9	161.2	0.66
2004 (R)	324	1,062	13.4	21.8	0.58
2006 (R)	343	1,284	11.3	8.8	0.50
2008 (R)	335	1,126	6.9	6.4	0.65
2010 (R)	405	1,033	17.3	127.5	0.80
2012 (R)	389	1,248	33.0	128.8	0.82
2014 (R)	368	1,139	42.6	227.5	0.76

Notes: Inflation adjusted (dollars in 2014 term). The unit of observation is a candidate and all the numbers indicate the mean value for each category. Candidate means the total spending (in thousand US dollars) by candidate(s). Outside Spending For Candidate means the total spending (in thousand US dollars) by outside groups to support the candidates. Outside Spending Against Candidate means the total spending (in thousand US dollars) by outside groups to oppose the candidates. Outside Groups' Media ratio means the ratio of total outside groups' spending on media among the candidates who had positive values for outside spending.

Table A6: Explaining Variations Across Campaign Expenditures: Incumbents

	(1) Admin.	(2) Wages	(3) Fundraising	(4) Media	(5) Polling	(6) Consultant
(ln) Total Spending	-4.212***	-0.791	-2.998***	8.870***	0.319***	-1.017**
	(-8.64)	(-1.81)	(-5.24)	(14.63)	(6.28)	(-2.49)
Democrat	-3.839***	4.539***	-5.485***	4.720***	0.0308	0.621
	(-3.79)	(5.61)	(-5.82)	(4.27)	(0.25)	(0.84)
Competitive Primary[a]	-4.846**	-3.526	0.293	9.069***	0.908***	-1.017
	(-2.04)	(-1.95)	(0.12)	(3.26)	(2.66)	(-0.51)
Swing District[b]	-6.250	7.016	-3.929	10.40	2.312***	-6.295
	(-1.03)	(1.63)	(-0.64)	(1.69)	(3.32)	(-1.30)
Female	0.447	0.161	-0.625	0.422	0.328**	0.206
	(0.43)	(0.14)	(-0.48)	(0.36)	(2.20)	(0.21)
Vote Share$_{t-1}$	0.219***	-0.0309	0.0376	-0.259***	0.00522	0.0156
	(6.25)	(-1.22)	(1.22)	(-8.25)	(1.08)	(0.63)
Leadership	5.167***	-0.416	3.810***	-6.287***	-0.189	-1.110
	(4.00)	(-0.41)	(3.16)	(-5.03)	(-1.30)	(-1.11)
Majority Party	-1.431***	-0.474	-1.591***	3.360***	0.0716	0.00547
	(-2.63)	(-1.25)	(-2.85)	(5.90)	(0.99)	(0.01)
Seniority	0.520***	0.212**	-0.225**	-0.197	-0.0389***	-0.306***
	(5.21)	(2.35)	(-2.29)	(-1.94)	(-2.99)	(-4.10)
African-American	1.864	-4.802***	0.135	-0.153	-0.174	0.560
	(0.88)	(-2.74)	(0.06)	(-0.08)	(-0.72)	(0.33)
Latino	1.596	-5.742***	2.611	-0.0671	-0.369**	1.750
	(0.73)	(-3.98)	(1.05)	(-0.03)	(-2.31)	(0.97)
Senior	0.309	-0.153	-0.105	0.0614	0.0439**	-0.0199
	(1.82)	(-1.14)	(-0.68)	(0.39)	(2.03)	(-0.15)
Ethnic Heterogeneity	0.111***	-0.0377	0.0742**	-0.129***	0.00846	0.00766
	(3.08)	(-1.29)	(2.03)	(-3.12)	(1.93)	(0.26)
Bachelor+	-0.134	0.217	-0.164	0.123	0.0245	-0.0990
	(-1.13)	(1.82)	(-1.21)	(0.98)	(1.67)	(-1.05)
Unemployment	0.247	-0.286	-0.0169	-0.250	0.0340	0.216
	(1.03)	(-1.76)	(-0.07)	(-1.01)	(1.30)	(1.06)
Urban	0.166***	-0.00332	-0.0129	-0.150***	-0.00920**	0.00388
	(5.03)	(-0.13)	(-0.43)	(-4.00)	(-2.50)	(0.16)
(ln) Income per capita	7.896	-6.008	5.678	-12.62***	-0.532	5.566
	(1.71)	(-1.38)	(1.14)	(-2.59)	(-0.95)	(1.45)
Gini	-0.408***	-0.0895	0.185	0.403***	-0.0377**	-0.00200
	(-2.84)	(-0.83)	(1.15)	(2.75)	(-2.34)	(-0.02)
Congruence	-0.00958	-0.00340	-0.00612	0.0154	0.00115	-0.00467
	(-0.43)	(-0.21)	(-0.30)	(0.66)	(0.38)	(-0.29)
Mean Value of Outcome (%)	35.6	10.8	11.3	17.9	1.3	9.7
Election Cycle FE	✓	✓	✓	✓	✓	✓
N	2093	2093	2093	2093	2093	2093
adj. R^2	0.306	0.106	0.103	0.420	0.098	0.104

Notes: Unit of observation = candidate × cycle. t statistics in parentheses. $^{**}p < 0.05$, $^{***}p < 0.01$. **a**. 1 - |0.5 - primary vote share|. Standard errors are clustered at the candidate level.

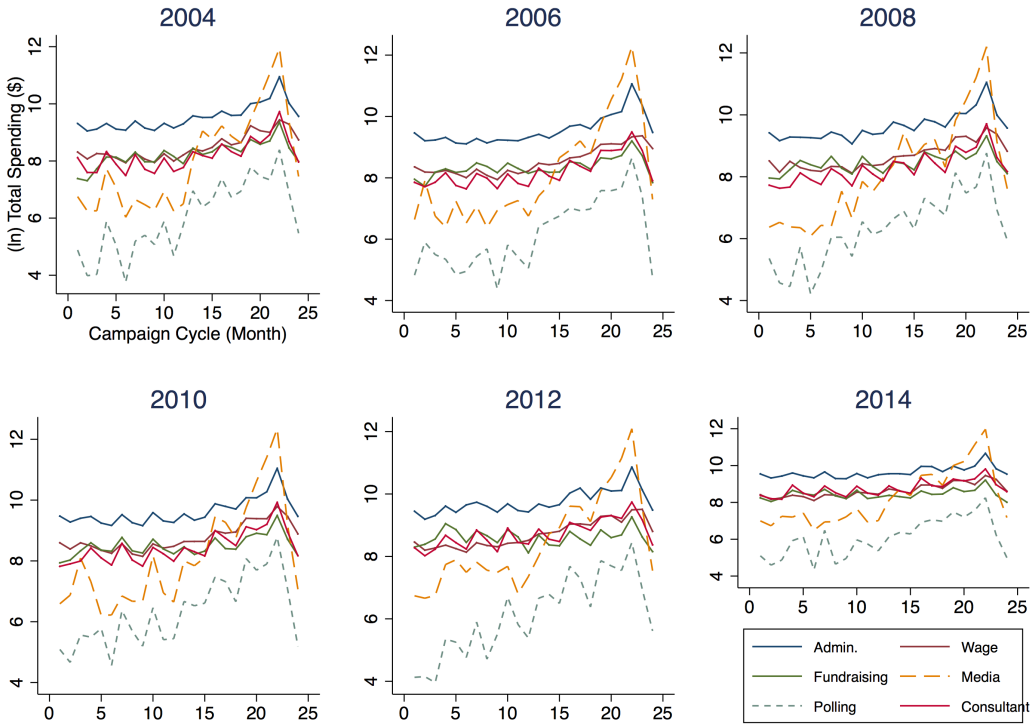
Table A7: Changes in Challenger Quality and Campaign Resource Allocations

DV = Change in Ratio	Δ Admin.(%)	Δ Wages	Δ Fundraising	Δ Media	Δ Polling	Δ Consultants
Change in Challenger Quality	-0.0193 (-0.03)	-0.0678 (-0.15)	-0.529 (-0.94)	-1.054 (-1.05)	0.0117 (0.12)	-0.738 (-1.20)
Candidate & Cycle FE	✓	✓	✓	✓	✓	✓
Demographic Controls	✓	✓	✓	✓	✓	✓
N	1728	1728	1728	1728	1728	1728
adj. R^2	0.328	0.305	0.367	0.325	0.350	0.425

Notes: *t* statistics in parentheses. $^{**}p < 0.05$, $^{***}p < 0.01$. Dependent variables are the absolute difference in the ratio in each category between *t-1* and *t*. Standard errors are clustered at the candidate level.

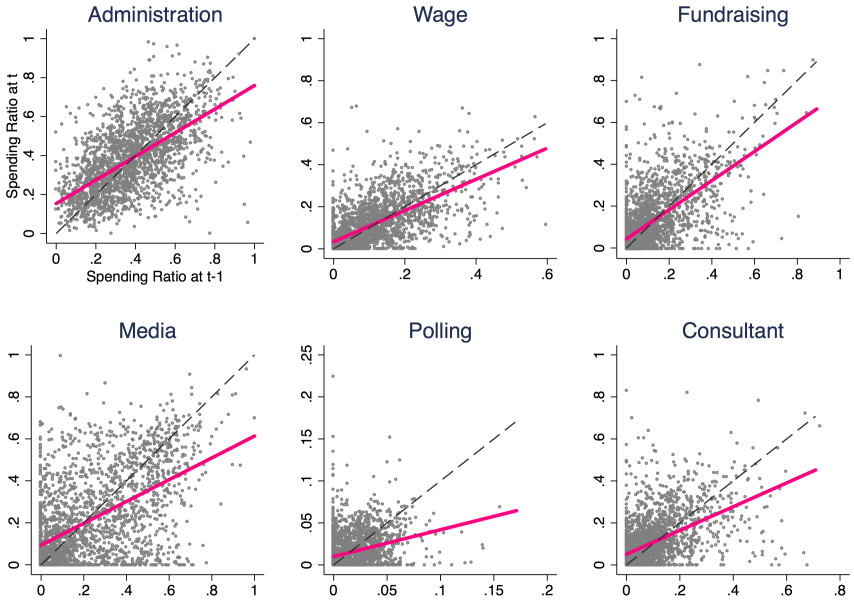
D Appendix: Figures

Figure A3: Monthly Total Campaign Expenditure by Category



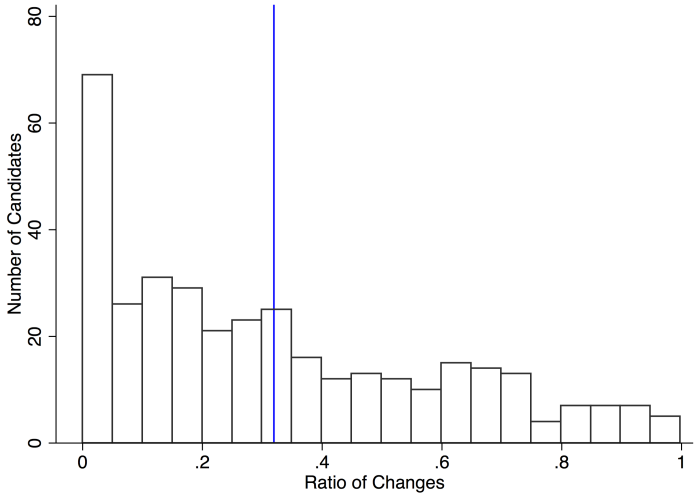
Notes: Y-axis indicates average (ln) total expenditures.

Figure A4: Correlations in Allocations of Campaign Resources Between Races



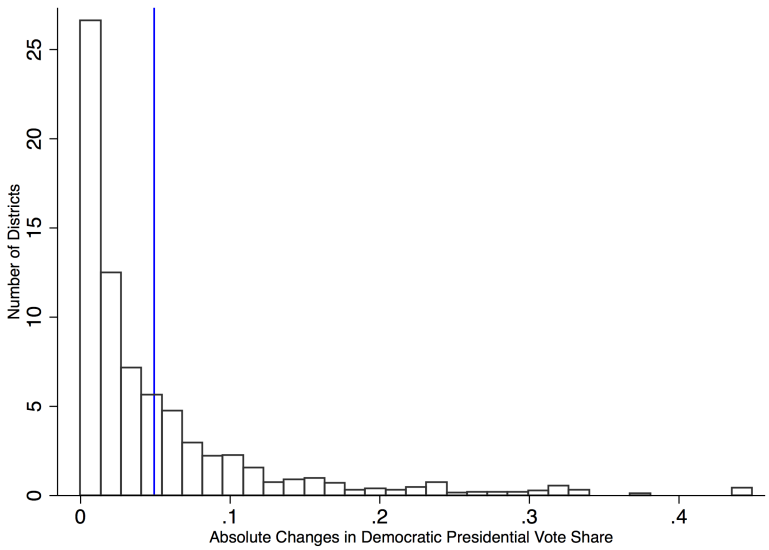
Notes: Graphs show the relationship between spending ratios from *t-1* to *t* in each category for the same candidate. Solid lines indicate a fitted line from regression and dashed lines indicate 45 degrees. Log-transformed total campaign expenditures are included in the regression.

Figure A5: Distribution of Changes Induced by Redistricting in 2012



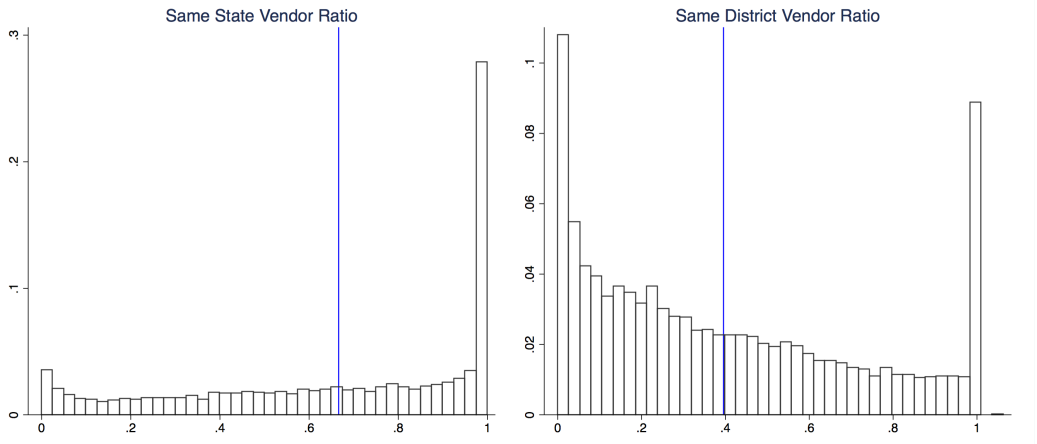
Notes: *Changes induced by Redistricting* capture 100 - the percent of land the incumbent still represents following redistricting. At-large districts, by definition, saw no change and received a value of zero. As the value increases, a member represents a district more dissimilar to the one where they won office during the 2010 cycle.

Figure A6: Distributions of Absolute Changes in Democratic Presidential Vote Share



Notes: The graph shows the distribution of ratios of total expenditures spent on vendors located in the same state or the same district as the candidates. Unit of observation is candidate $\times$ election cycle. Solid lines indicate the mean values.

Figure A7: Distributions of Ratios of Total Expenditures Spent in In-State (Left) or In-District (Right) on Vendors



Notes: The graphs shows the distribution of Democratic Presidential vote shares between 2008 and 2012 at the congressional district level. Solid line indicates the mean values.