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POLITICAL ADVERTISING IN PRESIDENTIAL ELECTIONS AND LAW MAKING IN THE
U.S. CONGRESS

BY

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DISSERTATION

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Abstract

This thesis contains two research areas including political advertising in presidential elections and legislating in the Congress. In the first chapter, we focus on political advertising, and the following two chapters investigate legislating output and success, as well as one special kind of legislation: earmark. Specifically, chapter 1 investigates the effects of political advertising in the 2000, 2004 and 2008 U.S. presidential elections. We integrate the decision of voter turnout and candidate choice in a discrete choice model, with candidate shares derived from the number of registered voters at county level. To address the endogeneity of advertising, we instrument for advertising exposure and tone with advertising price and its interaction with candidate, polling statistics and voter turnout in prior elections. In concert, our model and empirical strategy allow us to discern the role of qualitative and quantitative aspects of advertising on voter choice and election results. This paper contributes to the literature by finding robust effects of political advertising on candidate choice, that advertising exposure benefits candidates who advertise extensively. Advertising negativity is found to be positively associated with higher vote shares in two out of three elections considered. Our results are also robust to different definitions of voter market.

After the investigation of pre-election political advertising, we turn to study post-election legislative activities. In Chapter 2, we focus on legislative output and outcome in the U.S. Congress, which have received increasing attention in the literature. This paper mainly employs the data from 2007 to 2010 for the 110th and 111th Congress, explores the factors influencing bill sponsorship and cosponsorship, and presents evidence from institutional position, member characteristics and electoral concerns. We show that members holding leadership or committee chairs sponsor more bills but cosponsor fewer bills. Female, racial minority and ideologically more extreme members are more active in cosponsoring bills. Rich committee experience encourages a high level of bill sponsorship and cosponsorship, while freshman class members are generally disadvantaged. Chamber and party difference also exist. Further, this paper investigates factors affecting legislative success from the 93rd to 113th Congresses (1973-2014), and finds that the number of cosponsors,

referrals, majority status and committee chairmanship significantly help bills to be enacted into law.

Chapter 3 is a natural extension of chapter 2, which focus on Congressional earmarks in legislation from 2008 to 2010, and finds that retiring members request significantly fewer earmarks, after factors such as seniority, committee membership, general effort level and local demand controlled for. The result suggests the suboptimal use of earmarks that could be contributed to favor exchange or re-election purposes of the Congressional members.

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Chapter 1

Negative Advertising in U.S. Presidential Elections

1.1 Introduction

For modern-day politics in the United States, television advertising is incontestably the primary channel through which political campaigns seek to influence voters. During the 2008 presidential election, total spending on political advertising by candidates and interest groups reached at least \$2.6 billion, most of which, about \$2 billion was spent on local television.¹ Recent political campaigns have also been predominantly negative in tone. In the 2012 presidential election, Barack Obama spent \$404 million on advertising, of which 85% was spent on negative advertisement. Mitt Romney spent \$492 million, with 91% on negative advertisement.²

Despite the pervasiveness and public attention given negative advertising, researchers have not reached a consensus³ on the effectiveness of negative advertising. Do political attack ads disappoint voters, or do they incite voters and increase their interest in the race? Previous theoretical explorations of the effects of political advertising focus solely either on voter turnout or candidate choice, failing to integrate the joint decision. Empirical research on the causal effects of advertising often face difficulties addressing the endogeneity of political advertisement, or in the case of experiments, establishing external validity.

Among existing studies of political advertising, few have performed analysis incorporating both the decision to vote and whom to vote for based on actual election outcomes. This paper investigates the effects of advertising on both voter turnout and candidate choice in recent presidential elections, with a special focus on the effects of negative advertising. We construct a discrete choice model of voter utility, where voters decide whom to vote for, or abstain from voting, after absorbing information on candidate quality from

¹See New York Times, <http://thecaucus.blogs.nytimes.com/2008/12/02/about-26-billion-spent-on-political-ads-in-2008/>

²See Washington Post, <http://www.washingtonpost.com/wp-srv/special/politics/track-presidential-campaign-ads-2012/>

³Some early studies support a demobilization effects on voters (Ansolabehere and Iyengar (1994)), followed by a wave of further scrutiny and new evidences for a stimulation or uncertain effect (Che, Iyer, and Shanmugam (2007), Lau, Sigelman, and Rovner (2007)).

political advertising. The relative differences in the utilities from these options determine the vote shares of each candidate and the voter turnout rate. The model allows us to investigate the effects of advertising on election outcomes in the presence of voter abstention.

In terms of the empirical strategies, we aggregate political advertisements in each media market during a general election to obtain voter exposures to political advertising. We then calculate the negativity of advertising for each candidate, which is the percentage of negative advertisements among all advertisements sponsored for that candidate. By matching the market-level political advertising to the counties covered, controlling for a rich set of fixed effects and county-level characteristics, we are able to investigate the effects of advertising exposure and negativity on voter choice. We instrument advertisement by using lagged price of advertising and its interaction with candidate, current polling statistics and voter turnout in previous election.

Despite the conflicting conclusions of previous studies, this paper finds robust effects of political advertising on voter choice. Specifically, advertising quantity benefit candidates who advertise more, and advertising negativity is found to be positive related to higher vote shares in two of the three elections we considered. The rest of this chapter is organized as follows: Section 1.2 reviews literature. Section 1.3 discusses the theoretical model and associated empirical strategy. Section 1.4 describes the data and provides descriptive statistics. Section 1.5 presents empirical findings for advertising effects on voting behavior. Lastly, section 1.6 and 1.7 present further discussion and conclude the chapter.

1.2 Related studies

TV advertising is the major channel for political communications in the United States today.⁴ As Freedman, Franz, and Goldstein (2004) point out, political advertising contributes to “a more informed, more engaged, and more participatory citizenry”. Brians and Wattenburg (1996) find advertising exposure to be the strongest predictor of political learning and the only significant factor of issues recall near election, compared to newspaper reading and TV news. Their findings also hold when only considering negative advertising. Paid advertisements are oftentimes presented in a shorter and more perceptible fashion to ap-

⁴Television advertising is also the major component of campaign spending. Some studies do not explicitly distinguish between campaign spending and TV advertising, or use the former as a proxy for the latter. Campaign spending is merely a rough measure for political communications, since it does not reveal the extent to which voters receive or learn from the political information, or serve as a proportional scale for campaign effects, due to uneven distributions of advertising cost and expenditures on professional staff, and its exclusion of increasingly greater amount of “soft money” (Goldstein and Ridout (2004))

peal to voters, while news and debates generally offer more balanced information about several candidates, requiring more attention and cognitive ability to absorb.

During decades of research, the effects of political campaigning are generally recognized, but the direction of the effects is still the subject of debate. Theoretical work supports the effects of campaigning (Snyder (1989), Grossman and Helpman (1996)), but early empirical studies on political campaigns often suffer from identification issues and find a “minimal effect” on voter behaviors (Berelson (1954); Levitt (1994); Finkel (1993)). Inconsistent with theoretical predictions, those finding cannot explain the massive expenditures in political campaigning we observe today.

To control for omitted variables such as candidate quality, Levitt (1994) examines situation where the same two candidates compete with each other in multiple elections. Lovett and Shachar (2011) find that once controlling for endogeneity, the effect on turnout decreases and becomes insignificant, but the effect on voter choices increases significantly. Correcting for measurement errors, later studies find support for strong media exposure effects (Bartels (1993)). Zaller (1996) further argues that besides media exposure, predispositions, reception, and the balance of messages jointly determine whether voters are influenced by media. Therefore, advertising effects would be more prominent in elections with more one-sided messages, or among independent voters. Presidential election is presumably the battleground with the least one-sided flows of information, because of its significance and intensive media coverage. With cancel-out effects from major parties’ advertising (Zaller (1992)), it is also the field where one may least expect to observe significant campaign effects. Unlike commercial advertising, that consumers’ purchasing behavior can be repetitive across brands, or influenced by prior purchases of durable goods or past advertising. Such concerns are mostly nonexistent in the presidential election context. All the information and preferences will come down to one single vote on Election Day. Each election carries its unique characteristics, and is largely immune to the effect of past campaign efforts,⁵ with a new pair of major competing candidates.

Regarding the effects of negative advertising, early work such as Ansolabehere, Iyengar, and Simon (1999) suggest a demobilizing effect on voters, particularly among political independents through a weakened sense of political efficacy. Followed by a wave of further scrutiny and careful investigations, many studies have argued instead for a stimulation effect, that negativity will stimulate voters by increasing their information about the candidates, the degree to which they care about the election outcome, or the ties to

⁵Except the case for incumbent candidate seeking re-election, which is controlled for in our paper.

their party's candidates (Finkel and Geer (1998)). Empirical evidence for stimulation effect includes Freedman and Goldstein (1999), Goldstein and Freedman (2002), Krupnikov (2012), etc. Brooks (2008) and Krasno and Green (2008) have suggested uncertain or no effects of negative advertising. In a meta-analysis, Lau, Sigelman, and Rovner (2007) conclude that the research literature does not support the effectiveness of negative campaigning on winning votes or voter turnout, albeit negativity tends to be more memorable and stimulate knowledge about the campaign. In a theoretical work, Polborn and Yi (2006) models negative and positive campaigning where candidate convey truthful information to voters, and voters rationally update beliefs when casting votes. Their model explains why the electorate's opinion about the sponsor of a negative ad decreases, and why it may increase for the target.

Importantly, advertising strategies are correlated with unobserved voter preferences, and therefore are endogenously determined. Failure to account for endogeneity will lead to false conclusions over the effects of political advertising (Da Silveira and De Mello (2011)). To tackle the endogeneity problem, previous research has employed randomized field experiments, natural experiments, or instrumental variables to address the issue. For instance, Gerber, Gimpel, Green, and Shaw (2011) utilize a field experiment during the 2006 Texas gubernatorial election. They find that television ads have strong but short-lived effects on voter preference. Huber and Arceneaux (2007) employ a natural experiment,⁶ and find that television ads have little mobilizing or learning effect on voters, but strong persuasion effects on whom to vote for, especially among moderately aware respondents. Krasno and Green (2008) also use natural experiment of residents exposed to varying quantities of presidential advertising in a given state, and find the effects to be negligible on voter turnout from presidential advertising. From a quasi-experiment of two-round gubernatorial elections in Brazil, Da Silveira and De Mello (2011) find a large causal effect of TV advertising on election outcomes from the differences between rounds. Unfortunately, studies using experimental designs are subject to the weakness of lacking external validity, the local results obtained cannot be used for election outcome prediction or policy implication.

In the empirical attempts to account for the effects of political advertising, though a wide range of topics have been explored,⁷ few has integrated candidate choice and turnout decision in one model for empirical investigation of actual election outcomes. The action to cast a vote and the choice between candidates are

⁶Where residents in non-battleground states received high levels of campaign advertising since they reside next to a competitive state.

⁷The topics include separate effects for target and for attacker, voter's memory of ads, interest or knowledge in campaign, vote intention, political efficacy, etc.

indispensable in voter's decision, while previous studies focus on just one static problem of either candidate choice or voter turnout.

This paper models discrete voting choices, and estimates the effect of advertising exposures and negative tone in recent presidential elections. Only a handful of papers have adopted the discrete choice model for political advertising: Rekkas (2007) finds that campaign spending not only redistributes voters across parties but also decreases voter turnout in the 1997 Canadian general election. Che, Iyer, and Shanmugam (2007) examine the House, Senate and Presidential elections in 2000 using ANES⁸ data, they find negative ads run by a given candidate increase voter turnout and attract more votes for that candidate. Gordon and Hartmann (2013) use advertising cost as instrumental variables to address the endogeneity of advertising, accounting for time-invariant party preferences using market-party fixed effects. They find a positive effect of advertising exposures on voter choice and turnout. Martin (2012) estimates the informative effects and persuasive effects of campaign advertising from the US Senate and Gubernatorial elections, and finds evidence supporting the persuasive hypothesis. None of the previous research has specifically addressed the effects of both advertising exposures and negativity on candidate choice and voter turnout, utilizing actual U.S. presidential election results, which is the main scope of investigation in our paper.

1.3 Model and Empirical Strategy

One difficulty facing empirical studies of voting behavior is the unavailability of reliable voting data at individual level. Most surveys do not have extensive coverage, with the validity also subject to concerns. To circumvent this obstacle, this paper uses structural estimation of the discrete choice model to aggregate individual choices without having to observe them, i.e., we employ election results to recover the impact of advertising on voter choices.

Berry (1994) and Berry, Levinsohn, and Pakes (1995) (BLP thereafter) introduce a seminal and influential approach to estimate demand of differentiated products with aggregate market-level data. It addresses the problem of endogenous prices as well as heterogeneous consumer taste by dealing the former problem with instrumental variables, the latter by “inverting” the market share equation to find the implied mean utility of each product. The BLP method has been widely used for studying discrete choices. Our paper adopts this framework for studying voter behavior in a political context, using voter preference to uncover

⁸American National Election Studies.

the mean utility level for different candidates.

The discrete choice framework fits well in the election setting, where different candidates run campaigns competing for the office. Voters observe political advertisement during the campaign, absorb information about candidate quality, and make their final choices on the Election Day. Essentially, the choice set for voters is discrete, they either cast their vote, or throw it away. This is analogical to the differentiated products, where consumers decide between different products and not buying. After learning about product (candidate) quality and characteristics, it is the underlying voter heterogeneity (preference) that forms their choices between candidates and abstention. Unlike survey response or opinion polls, the actual election outcome is observable with accuracy, that truly reflects the choices voters made.

Specifically, we observe presidential advertising in Designated Media Market Areas⁹ (DMA thereafter), with N_r candidates¹⁰ in market r (Market r is suppressed for convenience in later context). Voter preferences can be modeled as $U(x_j, \xi_j, c_j, \nu_i; \theta)$, where x_j are observed characteristics of candidate j and some other factors that can influence voting decision, including candidate advertising, candidate policy positions (which are absorbed by candidate fixed effect in our model), and other factors commonly shared among all candidates like demographics and economic conditions in the same area. ξ_j is unobserved (to econometrician) random utility shock (charisma, valence, etc). c_j is the cost of voting. Although political choices entail no purchase of the object (candidates) advertised as in commercial ads, the action of voting embodies certain psychological cost, as well as time and transportation costs. The voting cost for different candidates is roughly the same in the same market (we define each market at county level, assuming similar weather and transportation conditions within the same county), so c_j mainly serves to distinguish voting from not voting. Lastly, voter heterogeneity is accounted for by the term ν_i , which is a vector of voter preference (for each candidate) that is unobserved. θ is a vector of parameters to be estimated.

Specifically, let the perceived utility of voter i for candidate j be:

$$u_{ij} = x_j\beta + \alpha c_j + \xi_j + \nu_{ij} \quad (1.1)$$

For brevity, define $\delta_j = x_j\beta + \alpha c_j + \xi_j$, which is the mean (average) level of utility voters derive from candidate j . Through months of campaigning, debates and advertising, voters absorb information and form

⁹A region where its population can receive the same (or similar) television and radio station offerings, mostly in a round shape, which covers multiple countries and sometimes cross state borders.

¹⁰ $N_r = 3$ in our context: A Democratic, a Republican, and a third party candidate.

their utility levels for each candidate. Voter i 's utility is now $u_{ij} = \delta_j + \nu_{ij}$, which is decomposed into candidate j 's quality (which is constant across voters) and the voter's personal preference towards candidate j .

Each voter casts one vote. Voter i will vote for candidate j if and only if the utility from candidate j is higher than all the others, i.e., for all other candidate $k \neq j$, that $U(x_j, \xi_j, c_j, \nu_{ij}) \geq U(x_k, \xi_k, p_k, \nu_{ik})$, which implicitly defines the unobservable voter preference, ν_i , that results in voting for candidate j . Define the set of voter unobservables that lead to voting for candidate j as $A_j(\delta) = \{\nu_i | \delta_j + \nu_{ij} \geq \delta_k + \nu_{ik}, \forall k \neq j\}$. Then, given a distribution $F(\nu)$, with density function $f(\nu)$, the voting share s_j for candidate j shall be:

$$s_j(\delta(x, p, \xi), x) = \int_{A_j(\delta)} f(\nu) d\nu \quad (1.2)$$

Since voting is administered at local levels and demographic and income distributions vary geographic areas, in order to capture as much information, market size for voting is defined as the number of registered voters M in each county.¹¹ In addition to the choices between competing candidates, note the existence of an outside option: Abstention. Voters will go out to the voting booth only when that entails a higher utility than otherwise. Failure to consider abstention would ignore the integral structure of deciding to vote and whom to vote for, and exaggerate the effects of advertising on candidates.

With voter utility defined above, we assume that ν_{ij} is identically and independently distributed across candidates, and follows a type I extreme value distribution function $\exp(-\exp(-\nu))$. The voting share of candidate j in each market is then given by the logistic expression:

$$s_j(\delta_j) = \frac{e^{\delta_j}}{\sum_{k=0}^N e^{\delta_k}} \quad (1.3)$$

For convenience, the mean utility of voter abstaining is normalized to zero ($\delta_0 = 0$). We have therefore:

$$\ln(s_j) - \ln(s_o) = \delta_j = x_j\beta + \alpha c_j + \xi_j, \quad (1.4)$$

which is the form that we'll investigate empirically.

¹¹Which is also the smallest unit for available voting results.

1.4 Data

This section discusses the structure of our data and associated empirical approach. We match political advertisements during general elections with each county’s election results, supplemented by a rich set of county-level characteristics. For the actual election outcomes, the statistics on vote shares are obtained at county level, while campaign advertising is made at DMA level, which can span across state and county borders.

1.4.1 Voting

The county-level election results are obtained from CQ Press (Voting and Elections collection). The data comprise of the number of all ballots cast and the votes for each party (Democratic, Republican, or the third party) respectively. We argue the use of actual election is a relatively superior measure than survey data, one reason being the widely documented evidence of over reporting (McDonald (2003)) in the latter. According to Burden (2000), the gap between National Election Study (NES) and official estimates of presidential election turnout has become increasingly severe, from 11 points in 1952 to 24 points in 1996.

Regarding actual election (aggregate turnout and candidate shares), the definition of eligible voters are diverse. To precisely measure voter turnout, we define market size M as the number of registered voters just prior to the Election Day. This data is retrieved at official election websites in each state to guarantee its accuracy. Previous studies have used the Voting Age Population (VAP) to measure market size, which does not count for foreign nationals, certain institutionalized people (felony disenfranchisement for instance), and most importantly, people who are politically unconcerned or plan not to vote. Similarly, studies utilizing VEP (voting eligible population) are slightly more accurate, nevertheless fail to count people in the last category. Since registration is mandatory for voting, restricting the population to only registered voters ensures our sub-sample contains only eligible citizens who intended to vote. Subsequently, the market share for each party is defined as the ratio of the number of votes their candidate receives relative to the number of total registered voters, and voter turnout rate is the total number of votes divided by total registered voters. In our empirical investigations, these calculated shares have been transformed accordingly as in equation (1.3). For instance, if the Republican candidate vote share is s_R and voter turnout rate is s_T , then the transformed voting share for the Republican candidate is $\ln(s_R) - \ln(1 - s_T)$.

1.4.2 Advertising and instruments

The political advertising data for U.S. general elections¹² in 2000, 2004 and 2008 is acquired from Wisconsin Advertising Project, whose data is collected by the Campaign Media Analysis Group (CMAG). CMAG is a commercial firm that is specialized in providing detailed information of real time political campaigns. It tracks and records political advertisement on all national TV and cable networks by a satellite tracking system, and provides detailed records of every political ad aired in various DMAs. Each record contains rich information on the airing time of the ad, the length and estimated cost, its sponsor and detailed content of the ad. CMAG covers political advertising in the top 75 DMAs of the United States in 2000, the top 100 DMAs in 2004, and all the 210 DMAs in 2008. According to Gordon and Hartmann (2013), the top 75 DMAs represent 78% of the country's population, and the largest 100 markets cover 86% of the households in the country (Goldstein and Ridout (2004)).

To accurately measure advertising exposure, we adopt an industry-standard gross rating point (GRP), which is the product of the percentage of audience reached by an ad, times its frequency in a given time frame (i.e., $GRPs = reach * frequency$). Although GRPs are not directly observable, our data can be constructed to recover this information. The advertising data contains estimated expenditures for each ad, which can be matched with advertising costs to recover ad exposures. Detailed advertising costs are obtained from various issues of Media Market Guide¹³ in 1999, 2000, 2003, 2004, 2007 and 2008. The costs for advertising are essentially the costs per GRP, which is referred to as cost per point (CPP). We use the 3rd quarter CPP projections to align with the timing of advertising, detailed to every time slot (dayparts¹⁴) in each DMA. Each ad is matched with its respective price according to its market, daypart, and sub-population (age 18 and above). Ad exposures of different tones can be calculated from aggregating over ads a and dayparts d at each market-party-election level. Specifically,

$$GRP_{mptn} = \sum_d \frac{\sum_a Expenditure_{amptdn}}{CPP_{mtd}} \quad (1.5)$$

¹²CMAG provides political advertising information on both primary and general elections. However, due to the presence of multiple candidates running for party nomination during primaries, we focus on general elections, where only one candidate per party is nominated for presidential office. Advertisements shown after both major parties' convention and announcement of nominees are considered for general elections.

¹³Published by SQAD, an industry standard media cost forecasting source for national TV, Spot TV, Hispanic Spot TV Plus, Spot Radio and the Internet.

¹⁴In TV programing, the practice is to divide a day into several parts: Early morning, day time, early fringe, prime access, prime time, late news.

where m denotes market, p is party, t denotes election year, n is the tone of an ad: positive, negative or contrast. Naturally, the total GRP at market-party-election level is comprised of GRPs in different tones: $GRP_{mpt} = \sum_n GRP_{mptn}$. Since advertising is likely to displays decreasing rate of return, a log transformation is applied to the aggregate advertising exposures in GRPs to control for its impact on voters: $Ad_{mpt} = \log(1 + GRP_{mpt})$.

Our advertising data contains every shot and line of an ad, as well as a category variable indicating whether this ad is classified as a negative ad (attacking other candidates), a positive ad (promoting own candidate), or a contrast ad (comparing different candidates). For instance, in a political ad aired on October 6 2008, the announcer asked: “Who is Barack Obama? He says our troops in Afghanistan are, ‘Just air-raiding villages and killing civilians.’ How dishonorable. Congressional liberals voted repeatedly to cut off funding to our active troops, increasing the risk on their lives. How dangerous. Obama and congressional liberals. Too risky for America.” This ad was concluded by McCain: ”I’m John McCain, and I approve this message.” This classification provides us the crucial information enabling the investigation of the effects of ad tones. We have reason to suspect voters, like the rest of human beings, may not perceive criticism and praise equally.

Figure 1.1 shows the composition of different ad tones in U.S. presidential elections. The percentage of negative ads keeps steadily rising from 28.8% in 2000 to almost 70% in 2008.

Table 1.1 provides the summary statistics of ad exposures during presidential elections in 2000, 2004 and 2008, measured in thousand GRPs. Note that due to different coverage of media markets across years, the average exposures cannot be used for rigorous comparisons. However, the composition of ad tones are strikingly different across years and parties. In 2000, the Republican candidate Bush has roughly the same amount of positive and contrast ads, with much less negative ads. Meanwhile, the Democratic candidate Gore has similar amount of negative and contrast ads. Four years later, both candidates Bush and Kerry turned to a much fiercer campaign strategy, with negative ads amount twice or three times that of positive ads. The ad tone has not been softened since.

Our advertising variables of interest are subject to the concerns over their exogeneity. We have reason to believe that there exists information unobserved to us, but matters for the decisions to advertise in some districts but not others. These factors may include local political preferences (voter heterogeneity, etc) and demographic dynamics. To address the endogeneity issue, proper instruments are needed for ad quantity

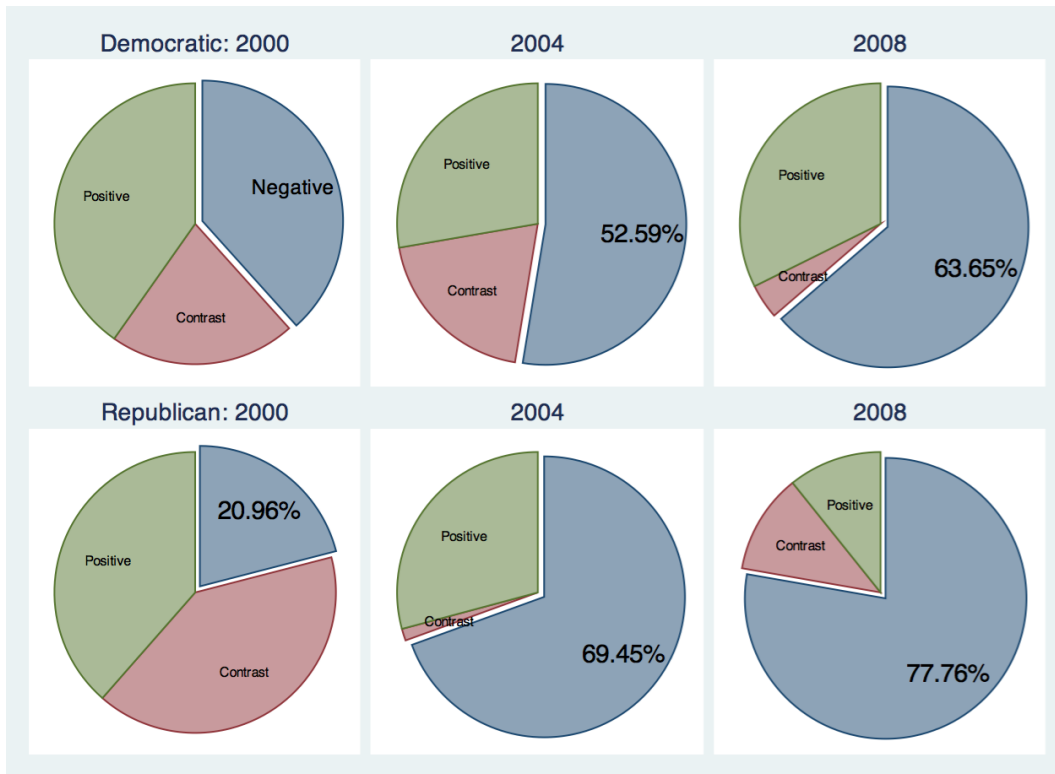


Figure 1.1: Ads composition across elections

Table 1.1: Summary Statistics for Advertising Exposures in DMAs

	obs	Mean	Std. dev.	Min	Max
General Election 2000:					
Bush: Negative Ads	73	1.074	1.09	0	3.578
Contrast Ads	73	2.204	2.092	0	5.597
Positive Ads	73	2.066	1.865	0	5.365
Gore: Negative Ads	73	1.912	2.383	0	9.92
Contrast Ads	73	1.096	1.322	0	4.283
Positive Ads	73	2.023	2.406	0	6.869
General Election 2004:					
Bush: Negative Ads	76	9.741	10.251	0	32.22
Contrast Ads	76	0.189	0.662	0	3.612
Positive Ads	76	3.989	4.553	0	20.717
Kerry: Negative Ads	76	9.824	10.391	0	33.524
Contrast Ads	76	3.446	3.401	0	14.524
Positive Ads	76	5.08	5.446	0	21.075
General Election 2008:					
McCain: Negative Ads	190	2.886	3.923	0	14.525
Contrast Ads	190	0.407	0.611	0	2.007
Positive Ads	190	0.384	0.606	0	2.568
Obama: Negative Ads	190	3.046	4.052	0	16.72
Contrast Ads	190	0.161	0.365	0	2.19
Positive Ads	190	1.483	1.999	0	7.354

and negativity. The ideal instrumental variables should be correlated with advertising, but uncorrelated with unobserved voter heterogeneity. Similar to Gordon and Hartmann (2013), we use lagged advertising price as instruments for ad quantity, because prices influence advertising strategies, but not voter's preferences. To eliminate the present-year price effect from heavy political advertising, we use lagged prices of advertising, which is immune to current campaign advertising, yet correlated with the election year prices and therefore ad quantities. The 3rd quarter's CPM (cost-per-thousand impressions¹⁵) prices one year prior to the election are utilized for this purpose. Similar to CPP, CPM also varies across markets, dayparts and elections. We also interact the price instrument with the Republican candidate as an additional instrument.¹⁶

One may argue that price may not be essential to advertising strategy, especially when they are less financially constrained. Instead, underlying voter preferences and information (not captured by econometricians) could be far more influential. In response to this concern, we include state-level polling statistics as additional instrument for ad quantities. Polling data is obtained from Real Clear Politics, which is the absolute value of spread (the difference) in the support rate for competing candidates. For places such as Texas and New York, the spread in support rate is large because of strong partisanship, and campaign ads are much less frequent than battleground states such as Ohio or Florida. Polling spread therefore displays a reverse relationship with campaign efforts, and is itself a strong instrument for ad quantities. Its validity is assured since the polls are driving campaign strategies and ads allocation, but have no impact on individual voter's preference. We employ state-level turnout rate as another instrument. The voter turnout rate in the previous election reflect the past competitiveness of the battleground, which correlate with former candidates but not the current ones. More importantly, it is not correlated with county-level voter preference, which affirms its validity as an instrument variable.

1.4.3 Other controls

We include a number of control variables to model voter preference over parties and factors influencing their decisions to vote.

Incumbency is an indicator for whether an incumbent candidate is running for re-election. In our samples of 2000, 2004 and 2008, only Bush in 2004 is incumbent. The interaction between opponent ads and incumbency is also included, as to check whether there exist additional benefit or cost for incumbent

¹⁵CPM data is also obtained from various issues of Media Market Guide.

¹⁶We use the prime time airing price to interact with the Republican candidate, in order to tell candidates apart.

Table 1.2: Summary statistics for other county characteristics

General Election 2000:					
unemployment Nov	4254	3.94	1.641	1.1	17.9
Δ unemployment	4254	-0.227	0.471	-2.8	2.7
median household income	4254	39.164	10.387	17.062	91.21
precipitation	4254	0.098	0.172	0.000	1.673
hispanic ratio	4254	0.036	0.078	0.000	0.8
black ratio	4254	0.081	0.127	0.000	0.968
previous state turnout	4254	0.497	0.054	0.38	0.72
previous county margin	4254	0.157	0.131	0	0.946
General Election 2004:					
unemployment Nov	4521	5.293	1.558	2.2	18
Δ unemployment	4521	-0.333	0.494	-3.1	2.3
median household income	4521	39.629	10.306	19.017	94.658
precipitation	4521	0.260	0.443	0.000	2.626
hispanic ratio	4521	0.044	0.102	0.000	0.934
black ratio	4521	0.083	0.130	0.000	0.959
previous state turnout	4521	0.517	0.059	0.4	0.66
previous county margin	4521	0.212	0.158	0	0.954
General Election 2008:					
unemployment Nov	8670	6.334	2.493	1.2	25
Δ unemployment	8670	0.515	0.79	-4.2	7.7
median household income	8670	43.477	10.73	19.182	111.582
precipitation	8670	0.049	0.140	0.000	1.157
hispanic ratio	8670	0.052	0.110	0	0.972
black ratio	8670	0.088	0.144	0	0.949
previous state turnout	8670	0.571	0.071	0.440	0.740
previous county margin	8670	0.277	0.184	0	0.927

candidate when facing opponent advertising.

Unemployment rate is also important to labor market morale approaching the Election Day. We obtain county-level unemployment rates in November and the annual average rates from the Bureau of Labor Statistics. The former is a good approximation of local labor market condition around election, and we also include a relative measure, which is the difference between annual unemployment rate and the November rate. For instance, Autauga county in Alabama has an annual unemployment rate of 4.5% and a November unemployment rate of 5.5%, therefore the difference would be a negative 1%, which indicates a deterioration of local labor market in November (A positive value indicates improvement). We are interested in the effects of both the labor market condition and its recent dynamics. Besides unemployment rate, we also include an income measure to as a predictor for political preferences. We obtain county-level median household income (in thousand dollars) from the Census Bureau (Small Area Income and Poverty Estimates) and expect higher income would increase voter participation.

Unlike commercial ads, voters do not bear cost for purchasing the goods(here as voting for candidates) advertised. Instead, the cost of voting entitles the transportation or time cost, or sometimes the psychological cost of fearing making a bad decision. In practice, weather condition on the Election Day is often a realistic factor affecting voter turnout. Precipitation in terms of rain or snow would potentially discourage voters from traveling to the polls. We obtain data on precipitation in each county on the Election Day from CoCoRaHS (Community Collaborative Rain, Hail & Snow Network). Admittedly this measure is not ideal, since many voters cast their votes before the actual Election Day, yet it provides a rough approximate of the weather condition for a large amount of voters that may deter their turnout.

1.5 Empirical Findings

1.5.1 Effects of advertising exposure and negativity

We present our empirical findings on voter choice in this section.

For all the specifications measuring voting shares in Table 1.3, each observation is for one candidate in one county during one general election.¹⁷ Restricting the sample to counties that appear either at least twice or strictly three times does not qualitatively change our results. Besides, we believe there exist no linkage

¹⁷Included in our sample are 73 DMAs in 2000, 76 DMAs in 2004 and 185 DMAs in 2008, covering 1417 counties in 2000, 1507 counties in 2004 and 2890 in 2008. Robust variances.

Table 1.3: Transformed voting shares in general elections in 2000, 2004 and 2008

	OLS	2SLS	2000	2004	2008
advertising: own ads	0.00938*** (0.0006)	0.0735*** (0.0033)	0.0612*** (0.0085)	0.0642*** (0.0061)	0.0773*** (0.0063)
own negative ads share	-0.0121 (0.0157)	1.472*** (0.1820)	2.034*** (0.2080)	0.136 (0.2120)	1.521*** (0.2300)
incumbency				2.589*** (0.1340)	
incumbent opponent ads				-0.0723*** (0.0074)	
county: unemployment in Nov			0.00385 (0.0099)	-0.0515*** (0.0114)	0.0235*** (0.0049)
median household income			0.0202*** (0.0015)	0.0160*** (0.0015)	0.0133*** (0.0011)
hispanic ratio			-0.145 (0.2070)	-0.899*** (0.1580)	-1.022*** (0.1150)
black ratio			-0.839*** (0.1350)	-0.166 (0.1170)	-0.337*** (0.0781)
precipitation			0.190** (0.0787)	0.101*** (0.0257)	1.072*** (0.0834)
victory margin	1.310*** (0.0278)	1.358*** (0.0413)	1.400*** (0.0829)	1.515*** (0.0714)	1.232*** (0.0455)
controls: party effects	Yes	Yes	Yes	Yes	Yes
year effects	Yes	Yes			
candidate effects	Yes	Yes			
Constant	Yes	Yes	Yes	Yes	Yes
Observations	17,445	17,445	4,254	4,521	8,670
Weak Instrument test F-stat		31.964	27.605	18.968	16.796

between the choice of political advertising and whether certain counties are included in CMAG's coverage. DMAs are simply ranked by population size, not by political preference or the importance to the election.¹⁸ Since we believe there's no pattern between political preference and the size of population, our sampling method do not suffer from potential selection bias. For robustness checks, we estimate using panel fixed effects on the subsample, and alternatively using pooled observations from the full sample, the findings are consistent with our main results.

The dependent variables in Table 1.3 are $\ln(s_j) - \ln(s_0)$, where s_j is a presidential candidate's vote share in the general election, which is the number of votes cast for that candidate in a county divided by the county's total registered voters. Note this is different from the usual practice of calculating vote shares, which is normally the votes for a certain candidate divided by total votes cast. Since our model explicitly counts in the option of abstention, the resulting vote shares in this paper are adjusted correspondingly.

Specification 1 (column 1) is the Ordinary Least Square estimation, including two measures of advertising: the amount of a candidate's own ads (measured by GRPs), and the percentage of which are negative ads; And a control for voter preference at county level. The previous county margin is the difference between parties' vote shares in the previous election, capturing the partisanship at county level, which is positive if the current candidate's party has the most votes previously, and negative otherwise.¹⁹ This specification does not control for the endogeneity of advertising, and the result suggests more ad exposure help the candidate choice, but the effects of negativity is insignificant.

Specification 2 includes the same set of variables, but with the two measures of advertising being instrumented for. Advertising exposure then exhibit a larger impact on candidate choice, own ad negativity also significantly help candidate gaining more votes.

The rest of the table further adds incumbent status and a rich set of county characteristics in labor market, household income, racial composition and the Election Day weather condition, with observations from the three elections respectively. Specifically, we observe that the incumbent candidate does enjoy an advantage over challengers, and challengers face additional disadvantage when the incumbent advertise more, evident in the 2004 election. High unemployment rate in November tend to be detrimental to candidates. Also,

¹⁸For instance, the top 10 DMAs include cities such as New York, Chicago, Dallas, and Houston, which have diverse political inclinations. Also, each DMA could cover multiple counties that may differ greatly in demographics and political orientations.

¹⁹Specifically, the measure is defined as the difference between the major two party's previous vote shares for Democratic and Republican candidates, and the difference between the third party and the winning party's previous vote shares for the current third party candidate.

higher annual household income encourage voting, but its interaction with Democratic candidates does not yield any evidence of additional effect (and therefore dropped). Regarding the racial minority composition, we include two measures as the percentage of hispanic and African American population at the county level. The results show that in 2000, higher black population tend to be detrimental to vote shares; In 2004, the effect is significant among more hispanic populated areas; And in 2008, both measures have negative effects on vote shares. As one would expect bad weather on the Election Day to discourage voter turnout, opposite effects are observed in the 3 elections we considered. From Specification 2 forward, when further controls are added, the effects of advertising exposure and negativity retain their significance (except for negativity in 2004), the effects of other factors remain relatively stable in both magnitude and statistical significance. We also reject the null hypothesis for weak instrument test, as the Cragg-Donald Wald F statistics show. However the null hypothesis for over-identifying restrictions are also rejected, possibly because of the correlation between the price instruments in different day parts. As Polborn and Yi (2006) point out, the effect of negative advertising varies with candidates, as voters rationally update their beliefs about candidates after observing a positive or negative campaign, the effects of negative ads are not uniform across elections or candidates.

We are not surprised to observe the positive effects of political advertising, otherwise the overwhelming campaign advertisement would be impossible to explain. We are more interested in the result for negative ads share, which indicates the effectiveness of attacking in the political context, in 2 out of 3 elections we considered. Note that the effects of negative ads may vary within different voter groups: Some could be discouraged from massive attacking in political ads, finding politics repulsive in general. Stand-fast voters could be infuriated and take actions to promote their preferred candidates. Albeit the composition of voters is difficult to define, our results provides an estimate for negativity which validates its effectiveness. More importantly, as in the theoretical work of Polborn and Yi (2006), whether candidate choose to advertise positively or negatively depends on the relative quality of the candidates. Voters may update their beliefs from a negative campaign that the sponsoring candidate may have nothing much to say about himself, and therefore the opinion toward the target of a negative ad may increase. Further, in an asymmetric match between a positive and a negative campaigner where most candidate campaign negatively, the negative campaigner is on average more likely to win.

1.5.2 Marginal effects of advertising

From the parameter estimates in Table 1.3, we calculate the marginal effects of advertising with respect to candidate vote shares in the three presidential elections²⁰ of interest. The unit of change is 1000 more GRPs for candidate's advertising quantity, and 1% increase in advertising negativity level (the left and right panel of Table 1.4 respectively).

The marginal effects of advertising to own and other candidate are given by:

$$\begin{aligned}\frac{\partial s_{jt}}{\partial Ad_{jt}} &= \beta s_{jt}(1 - s_{jt}) \\ \frac{\partial s_{jt}}{\partial Ad_{kt}} &= -\beta s_{jt}s_{kt}\end{aligned}\tag{1.6}$$

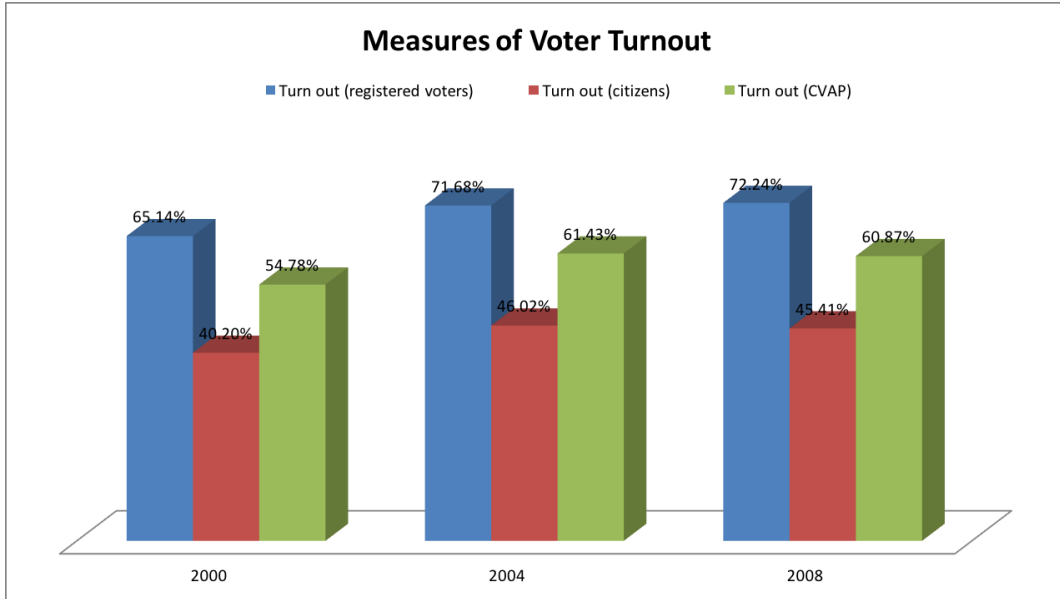
Table 1.4: Marginal effect estimates for recent presidential elections

	Of of advertising quantity			Of advertising negativity			
	Presidential Election 2000						
	Gore	Bush	3rd Party	Gore	Bush	3rd Party	
Gore	0.0100			0.3310			
Bush	-0.0023	0.0092		-0.0772	0.3072		
3rd Party	-0.0002	-0.0002	0.0009	-0.0063	-0.0058	0.0306	
	Presidential Election 2004						
	Kerry	Bush	3rd Party	Kerry	Bush	3rd Party	
Kerry	0.0115			0.0244			
Bush	-0.0034	0.0113		-0.0072	0.0239		
3rd Party	-0.0001	-0.0001	0.0003	-0.0001	-0.0001	0.0006	
	Presidential Election 2008						
	Obama	McCain	3rd Party	Obama	McCain	3rd Party	
Obama	0.0141			0.2782			
McCain	-0.0040	0.0130		-0.0786	0.2561		
3rd Party	-0.0001	-0.0001	0.0005	-0.0024	-0.0021	0.0100	

To interpret the marginal effects, for instance in the left panel for advertising quantity, an increase of 1% total advertising exposures for Bush will reduce the Democratic candidate Kerry's vote shares by 0.0034%. With regard to the negative tone of advertising, 1% increase in negativity of Gore's advertising will gain him 0.3310% more vote share in 2000, and 0.2782% for Obama in 2008. Similarly, the price elasticities of political advertising can be calculated, with $\eta_j = -\alpha p_j(1 - s_j)$ and $\eta_{jk} = \alpha p_k s_k$ being the own- and cross-elasticities, the results are omitted since they do not provide counterpart interpretations of the tradi-

²⁰For each presidential election, we use the parameter estimates for that election in calculation.

Figure 1.2: Alternative measure of voter turnout



tional price elasticities for purchases.

1.6 Discussions

1.6.1 Robustness

Different definitions of market size for voters

As mentioned earlier, in each county, we define the market size for voters to be the number of registered voters prior to the Election Day, which might be a more restrictive measure of market size, relative to those previously used in literature. One may be reasonably concerned over whether a different definition of market size would produce different result. We therefore experiment with two alternative measures of market size. The following figure shows the three definitions of market we employed.

One is the the estimated number of citizens at each county level, and the other being the estimated Citizen Voting Age Population (CVAP). We obtain the data for 2000 from the Census 2000 Special Tabulation (Citizenship by Race & Hispanic Origin), the 2008 data from the 2007-2011 American Community Survey 5 year estimates, and the 2004 data is calculated as the average between 2000 and 2008. We run the same

regressions as in Table 1.3 using the alternative measures of market size above, and both yield consistent results with those from the original definition.

Different data coverage

As mentioned earlier in the empirical findings, that restricting our sample to counties that appear twice or three times does not qualitatively change our results. Specifically, restricting our data to counties that are included in 2000, 2004 and 2008 result in 9855 observations, and 13851 observations if restricting data to counties that appear in two general elections. Also, we can see that in Table 1.3, the data comprised of three elections exhibit similar results as those when we estimate the three elections separately.

Principle Component Analysis

Considering the number of instruments employed in our estimation, we want to take a further examination for the first stage results of the 2SLS method. The approach we adopt is Principle Component Analysis (PCA thereafter). Essentially, PCA uses linear combinations of the explanatory variables are predictors, while the covariance between these linear combinations are zero. PCA is often employed for dimensionality reduction, while retaining the variance of the original data. It is therefore an appropriate approach in our context to validate the effectiveness of first stage estimations, since it can eliminate the possibility of over-identification, caused by redundant instruments, and produce comparable estimation results that can be used for robustness check.

PCA has several good properties, such as reduction is bias, mean square error and mean square forecast error (Amemiya (1966)). Though prior knowledge about the predictors and their relationship is always helpful for choosing the principle components to be retained, we do not have a theory about which predictors should have more explanatory power over others, especially for the prices of advertisement. Therefore we proceed the investigation of first stage estimation under PCA without imposing further assumptions. Figure 3 is the screeplot depicting the eigenvalues of principle components.

A visual approach for deciding how many principle components to use is the so-called “elbow method”, taking the number of the first principle component from where the plot becomes flat. In our case, the “elbow” comes in at the fourth components, and the plot gets even flatter after the seventh component. Further, it is only after the seventh component that the total variance of our original data exceeds 96.22%, where 95%

Table 1.5: Principle Components Analysis comparisons

	share_ols	pca_2SLS	pca2000	pca2004	pca2008
own ads	0.00938*** (0.0006)	0.0488*** (0.0061)	0.0526*** (0.0130)	0.0651*** (0.0087)	0.0688*** (0.0086)
own negative ads share	-0.0121 (0.0157)	4.691*** (0.4770)	4.178*** (0.4020)	2.232*** (0.4340)	2.697*** (0.4060)
incumbency				1.469*** (0.2330)	
incumbent opponent ads				-0.0732*** (0.0105)	
unemployment in Nov			0.004 (0.0145)	-0.0670*** (0.0147)	0.0333*** (0.0067)
unemployment*incumbent				-0.0594 (0.0464)	
median household income			0.0170*** (0.0024)	0.0154*** (0.0021)	0.0148*** (0.0014)
hispanic ratio			-0.0893 (0.2580)	-1.258*** (0.2090)	-0.806*** (0.1470)
black ratio			-1.004*** (0.2060)	0.388** (0.1930)	-0.328*** (0.0965)
precipitation			0.344*** (0.1160)	0.129*** (0.0414)	1.236*** (0.1080)
victory_margin	1.310*** (0.0278)	1.531*** (0.0727)	1.419*** (0.1370)	1.834*** (0.1160)	1.253*** (0.0574)
party effects	Yes	Yes	Yes	Yes	Yes
year effects	Yes	Yes			
candidate effects	Yes	Yes			
Observations	17,445	17,445	4,254	4,521	8,670
Weak Instrument test F-stat		22.512	23.461	16.346	14.183

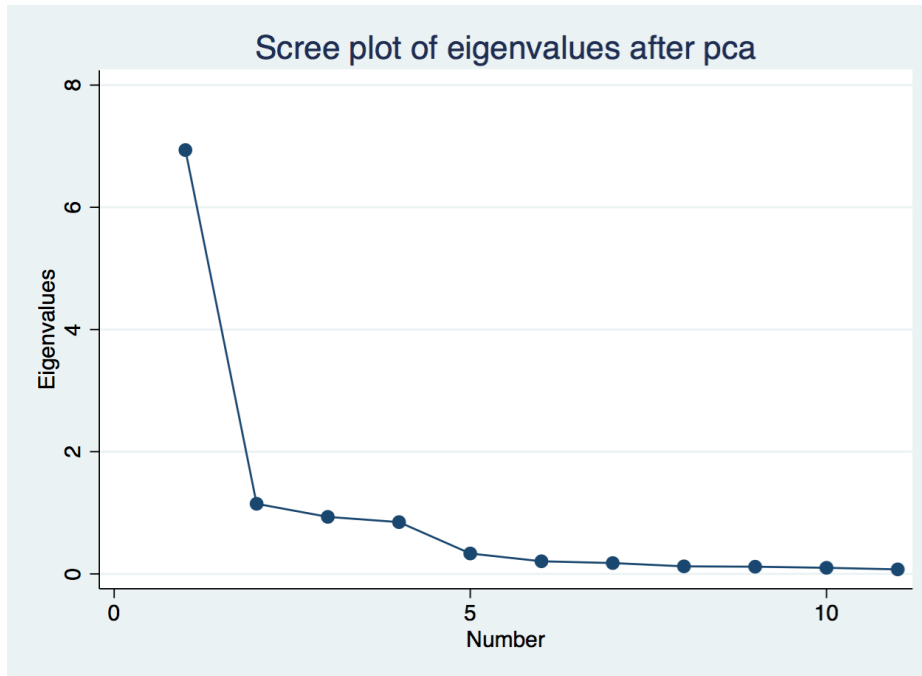


Figure 1.3: Screeplot from Principle Component Analysis

is a commonly acceptable level used to choose principle components. Using seven principle components, most of our results retain previous direction and significance level, but the R^2 's are lower, as shown in Table 1.5. Column 1 is the OLS estimation from previous configuration, and the following columns are those with six principle components.

1.6.2 Relaxing the IIA assumption: Nested logit

One caveat of the standard logit estimation of the discrete choice model is the violation of the independence of irrelevant alternatives (IIA) assumption. The assumption of voter preference ν_{ij} being independently identically distributed (iid) explicitly implies the substitution pattern between choices are symmetric, which could be unrealistic in many applications. For instance, suppose we have 3 left-wing party candidates and 2 right-wing party candidates running for election. The iid assumption of voter preference implies that if we remove one right-wing party candidate, the voters previously preferring that candidate would now randomly distribute among all the remaining candidates, which contradicts our experiences that those voters would more likely to gravitate to the remaining right-wing candidate. In this case, voter preferences are very likely to correlate among certain candidate (for instance the right-winged ones), and the odd ratio would change because of nonrandom distribution if we eliminate one candidate.

Generalized extreme value models (also known as nested logit) allow partial relaxation of the IIA property, which is useful when some alternatives are similar to others (we shall group those similar options). In our context, it allows voter preference to correlate between some candidates (within the group), so that the IIA holds within the group but not across the groups.

We first attempt to group all three candidates in one group. The vote share of candidate j as a fraction of the total group share is $\bar{s}_{j/g} = [\exp(\delta_j/(1 - \sigma))/D_g]$, where $D_g = \sum_{j \in G_g} \exp(\delta_j/(1 - \sigma))$. With the outside good alone in group zero, we normalize $\delta_0 = 0$, $D_0 = 1$, so that $s_0(\delta, \sigma) = 1/[\sum_g D_g(1 - \sigma)]$. After some algebra, one can obtain the vote shares now as:

$$\ln(s_j) - \ln(s_0) = \delta_j + \sigma \ln(s_{j/g}) + \alpha c_j \quad (1.7)$$

The last term is endogenous, requiring additional instrument that correlate with the within group share. Since our data contains limited information on the Election Day weather condition, and no information on transportation cost, the task of finding proper instrument becomes formidable. Ideally we need exogenous variables that distinguish the choice between candidates from not voting. We tried instrumenting using the precipitation data on the Election Day, median household income or racial composition of the county, but these instruments fail to pass the weak identification test, and the endogeneity of the within group share make the parameter estimates meaningless for interpretation.

Alternatively we experiment a two-level nested logit structure, where we further group the major two party candidates in one sub-group, the third party candidate in another sub-group. In the two-level model, we have:

$$\ln(s_j) - \ln(s_0) = \delta_j + \sigma_1 \ln(s_{j/g}) + \sigma_2 \ln(s_{h/g}) + \alpha c_j \quad (1.8)$$

Where σ_1 is the correlation of voter preference in the same sub-group, and σ_2 being the correlation of voter preference across sub-groups. Again in subsequent empirical attempts, the endogeneity issues of the two nested share (within and across) cannot be fully addressed yet, with the estimates of σ sometimes outside the normal range of $(0, 1)$, which prevents further investigation of the nested logit model at the present stage.

1.7 Conclusion

Despite the intensive research into the effects of negative advertising, few have performed empirical analysis incorporating both candidate choice and the decision to vote using aggregate election returns. Concretely, this paper models the discrete choice from voter's utility, and test the effect of advertising and negativity in recent presidential elections. We find consistent evidence for the effects of advertising exposure, and effects for negative advertising are found in 2 of the 3 elections we employed, with party and candidate fixed effects, as well as county-level characteristics.

Several limitations of this paper are worth investigating in further research. First, our model is a static one, which does not account for the timing of political advertising. Specifying the dynamic effect requires modeling the supply side of political advertisement and shall introduce further endogeneity, which remains a formidable challenge in the current context. Second, our paper does not explicitly model how voters form their beliefs about candidates from advertisement, or what they expect from the election by casting a vote. As Gordon and Hartmann (2013) point out, expectation data has well-known challenges and would impose additional structure to the model that are too stringent, as well as more data requirement, which cannot be met at the present stage. We look forward to improved data and methodology in future studies on political advertising.

This paper is among the first to combine candidate choice and voter turnout choice, and estimate the structural model using actual election outcomes. It contributes to the literature by finding robust effects of political advertising, that advertising exposure and negativity benefit candidates who advertise extensively or with a more negative tone. The findings in this paper provide empirical evidence and justification for the increasing negativity in modern politics.

Chapter 2

Lawmaking in the Congress: Diligent legislators and successful legislation

2.1 Introduction

Law regulates economic activities, protects its citizens and ensures their rights against abuses from other people or organizations in an ever changing cultural and economic environment. In the United States, lawmaking is one of the essential job functions of the Congress, and the study of lawmaking is also one intriguing topic in political economy. Why are some Congressional members more productive than others? Why do they spend much time cosponsoring a bill? What predicts the success of legislation?

In the U.S. Congress, a sponsor is a congressional member¹ (senator or representative) who introduces a bill (or an amendment). Although only one sponsor is allowed per bill, each bill or amendment can have unlimited number of cosponsors, indicating support and have their names included as cosponsors. Since 1937, the Senate has allowed an unlimited number of cosponsors for legislation, and the House since 1967. Bill sponsorship and cosponsorship has become an integral part of Congressional member's daily work. During the 111th Congress (2009-2010), the median number of bills sponsored and cosponsored by a House representative was 8 and 55 each year, and the maximum numbers was 60 and 319, respectively.

Among thousands of bills introduced in each Congress, the percentage of which that are enacted into law is rather low. On average, only 4.1% of all bills introduced were passed during the 110th Congress and 3.6% for the 111th Congress.² Despite the low success rate, members of Congress are devoting a great amount of time and staff efforts in legislating activities, which include drafting and soliciting cosponsors for their own bills, and responding to other member's requests for cosponsorship. Concretely, bill sponsorship and cosponsorship carry meaningful benefits and costs. Several theories have provided explanations behind

¹A committee can sometimes be a sponsor for legislation as well. We do not consider the case in this paper.

²Among the 7336 bills introduced by House members and the 3741 by senators in the 110th Congress, only 460 became laws. A total of 383 bills became laws among the 6562 bills introduced by the House and the 4059 by the Senate during the 111th Congress. Source: THOMAS Library of Congress.

the phenomenon, such as position taking, coalition building, potential electoral or policy rewards, that substantially benefit senators and representatives independent of bill passage.

Legislation sponsorship and cosponsorship differ greatly in the level of efforts required. The former requires years of experience, expertise or staff resources to formulate, while the latter is often achieved with ease³. Members with diverse backgrounds and expertise allocate their priorities between sponsorship and cosponsorship to maximize their objectives. Hypothetically, members holding important institutional positions have a higher chance of legislative success and therefore are more motivated to sponsor legislation, while their cosponsor incentives are reduced. Members who are traditionally disadvantaged in the Congress (e.g., racial and gender minorities) resort more to cosponsorship as means to build coalition and take position. Reelection incentives similarly drive cosponsorship in a way that encourages freshman members but inhibits retiring members. This paper first utilizes data during the 110th and 111th Congress to investigate the factors shaping the degree to which congressional members participate in legislation sponsorship and cosponsorship, and tests for the member quality, characteristics and reelection hypotheses presented in this paper.

In terms of bill passage, given that 96% of legislation that are routinely faced with defeat, what are the key qualities that enables a bill to be successfully pass both chamber and finally signed into law? What kind of legislators can have his or her bill enacted, maybe more than once?

In the next step, this paper predicts bill passage as the success of legislation, and the success of legislators, which is measured by the number of bills enacted into law. We use a set of factors such as the number of cosponsors, referrals, majority status and committee chairmanship of its sponsors for predicting the former, and another set of factors of member quality, characteristics, and reelection prospect for the latter. The bill passage data is also merged with the legislating output data. In addition, we look at whether bills having more cosponsors are easier to become public laws, which helps to explain the prevalence of cosponsorship and its use to sponsorship in the Congress.

³Because each bill permits only one sponsor, other members with less participation in drafting the bill are cosponsors. Since the majority of cosponsors only sign their names without contributing to the content of legislation, our claim holds that cosponsorship requires much less effort than sponsorship.

2.2 Related Literature

Various incentives are driving the legislative efforts for members of Congress to sponsor and cosponsor bills, such as seeking political power (Dodd and Oppenheimer (1977), Mouw and MacKuen (1992)) or good public policy (Woon (2008)), position-taking (Koger (2003), Woon (2008)), and re-election (Mayhew (1974), Campbell (1982)).

One influential theory explaining the seemingly suboptimal use of legislation sponsorship and cosponsorship is position-taking. According to Mayhew (1974), “the electoral payment is for positions rather than for effects.” There exist benefits from position-taking that are independent of a bill’s passage, especially for cosponsorship, which is relatively an inexpensive signal to send to both constituents and within the legislature (Kessler and Krehbiel (1996)).

Electoral rewards is another attractive factor. The reelection prospects for legislators is enhanced by introducing bills on issues that concern their constituents, with the effect greatest when the introduced legislation become a law. Cosponsorship has also been traditionally viewed a means to build coalitions, which helps to secure a seat in the Congress. Consistent with this prediction, Campbell (1982) finds that senators with higher electoral margins cosponsor fewer bills.

Besides the re-election incentives, Woon (2009) shows that senators are motivated by policy rewards from successful legislation. Even though the probability of bill passage is rather low, the potential benefit from new policy outcomes are sufficiently large to drive bill sponsorship. In terms of cosponsorship, Koger (2003) explains cosponsorship as a signal to agenda setters and a form of position taking for their constituents, donors, and interest groups. Woon (2008) uses cosponsorship data to test for position taking and the policy seeking theories, and finds moderating effects of the two theories in the 101st to 108th Congress.

The effect of seniority and institutional positions has been explored in the empirical literature. Campbell (1982) argues that senior members are more likely to possess political influence and an established reputation that are worth protecting. Therefore legislators with greater seniority should be more selective in their choices to cosponsor. Thus, seniority should be negatively associated with cosponsorship. Koger (2003) confirms the negative relationship in the House. Garand and Burke (2006) find the effect to be positive on sponsorship and negative on cosponsorship, with the argument that senior members gained experiences that facilitate sponsorship. However, cosponsorship is not a priority for these members, given the various demands on their scarce resources. Analogously, institutional position may have similar effects as seniority.

Koger (2003) finds party leaders cosponsor fewer bills. Similar negative effects have been found by Woon (2008) and Davidson, Oleszek, Lee, and Schickler (2013).

Demographics play a role in sponsorship and cosponsorship activities. Despite the fact that Epstein, Fowler and O'Halloran (2006) find that minority legislators create more coalitions to maximize cosponsorship, most empirical findings show that minority members are disadvantaged in legislative efforts⁴. Rocca and Sanchez (2008) find racial minority legislators sponsor and cosponsor significantly fewer bills in Congress. Garand and Burke (2006) find that African American members sponsor fewer bills, and that female members cosponsor more bills in the House.

Member's personal characteristics such as ideology (Garand and Burke (2006), Campbell (1982)) and general legislative activities (Campbell (1982), Harward and Moffett (2010), Koger (2003)) have also been discussed. One may reasonably expect a member who sponsors more actively would also cosponsor more bills from higher productivity. Ideologically extreme members are also more active in sponsoring and cosponsoring, as means to signal their positions through legislative efforts.

There are controversies over the effect of electoral vulnerability. On one hand, position taking can be risky (Mayhew (1974)), so electorally vulnerable members may be deterred from sponsoring and cosponsoring too many bills, avoiding the risk of disturbing their constituents and interest groups. On the other hand, taking the right bets (sponsoring or cosponsoring the proper bills) serves as a positive signal to their constituents and the party and can be politically rewarding (Rocca and Sanchez (2008), Koger (2003), Harward and Moffett (2010)). Though incumbents can use sponsorship or cosponsorship history as evidence of his policy achievements or political views, competitors often deliberately pick certain sponsorship or cosponsorship records to attack incumbent members for diverging from the interest of their party or constituents.

In terms of legislative success, Browne (1985) finds positive correlation between large number of sponsors and legislative success rate. Frantzich (1979) re-examine the success rate using a rich set of factors, and find seniority, committee membership, party leadership, majority party, and electoral security to be predictive of legislative success. Similarly, Moore and Thomas (1991) attribute success rate to ideologically moderate, highly specialized, senior members of the majority party who spend little time courting their constituency. Although much discussed as an indicator for the popularity of bills (bandwagon effect), Wilson and Young (1997b) show that cosponsorship provides merely "a signal concerning expertise at the

⁴We use "legislative efforts" and "sponsorship and cosponsorship" interchangeably in this paper.

outset of the legislative process”, and weakened thereafter. They concur with Anderson, Box-Steffenmeier, and Sinclair-Chapman (2003), who investigate bills counts in different stages, and find that legislators who balance their activities (“sponsor bills but not too many, speak on the floor, but not too often”) enjoy more success.

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2.3 Hypotheses

As rational political actors, congressional members weigh the cost and benefit when considering whether to sponsor or cosponsor legislation. The benefits come from various sources such as position-taking, political power (agenda influence), reelection prospects and potential rewards from good public policy. The decision to sponsor a bill carries an opportunity cost that overlooking other issues that may help to establish a reputation (Schiller (1995)), thus the political costs of sponsorship or cosponsorship are associated with the reelection prospects. One’s choice of cosponsorship must be carefully examined to avoid attacks from potential opponents or conflicts with interest groups or constituents. We recognize diverse goals that a congressional member may pursue during his career, and classify the factors influencing the cost-benefit considerations into several categories as below.

***Member Quality Hypothesis:** Congressional members holding important institutional positions sponsor more legislation, but cosponsor less. Positional advantages also extend to bill passage.*

First, we examine institutional positions. Members holding important positions such as party leaders are influential and powerful in terms of a higher chance of bill passage. This increases the potential rewards from

bill sponsorship. Thus, we expect committee chairs, majority or minority leaders to exhibit higher levels of bill sponsorship and bill passage alike. In terms of cosponsorship, prestigious members do not need to use cosponsorship in order to signal their position. Moreover, cosponsorship may be time-consuming and there can be risks associated that could lessen their established reputation. We expect these members to cosponsor fewer bills. The same applies to seniority. More senior members are more experienced and have developed expertise that will boost sponsorship, but their incentives to cosponsor legislation are reduced.

***Member characteristic Hypothesis:** Racial and gender minority, freshman class and ideologically more extreme members sponsor less legislation, but cosponsor more.*

Second, we examine member characteristics. Racial and gender minorities (African American, Hispanic, and female members) are generally disadvantaged in bill sponsorship (a lower chance of legislative success) especially in the House. As a result, they may resort to cosponsorship as means in order to build coalitions in Congress and participate in legislative process. Freshman members lack the experience and expertise required for bill sponsorship, so we expect first time legislators to have lower sponsorship levels.

***Reelection Hypothesis:** Reelection pressure encourages legislative activities that enhance the member's chance to be reelected, and vice versa.*

Finally, we examine electoral considerations. The potential benefits from successful legislation sponsored or cosponsored will enhance the chance of being reelected. Since members who are electorally unsafe have a stronger need to secure their office, they will cosponsor more as an inexpensive signal for their constituents. Policy extremists are more likely to cosponsor legislation for coalition building as well (Kessler and Krehbiel (1996)). Also, members from more populated states face higher and perhaps more diverse constituent demands, which should lead to more bill sponsorship in order to address issues that concern their constituents. Retiring members no longer consider reelection as a prospect and thus may cosponsor fewer bills.

2.4 Data and Empirical Findings

2.4.1 Data and variable descriptions

This paper first analyzes bill sponsorship and cosponsorship data from 2007 to 2010 of the 110th and 111th U.S. Congress. The sponsorship and cosponsorship records for each Congressional member is obtained from

Thomas Library of Congress. Party affiliation and chamber service are obtained from the Congressional Bibliographical Directory. Committee assignments are provided by Charles Stewart's Congressional Data. Demographic data is obtained from various reports by Congressional Research Service. Election statistics are retrieved from the Federal Election Commission. This paper uses the 2010 Census for population from the U.S. Census Bureau. DW-NOMINATE scores are used to measure member's ideology (Carroll, Lewis, Lo, Poole, and Rosenthal (2008)).

Table 2.1 presents the summary statistics for all members in the 110th and 111th Congress by chamber. An median member of Congress sponsors 9 and cosponsors 59 bills each year, while the most diligent members can sponsor up to 121 bills and cosponsor 319 bills. Senators on average have 1.166 bill passed each Congress,⁵ while the most successful House representatives have 14 bills passed during a Congress. Among all members in the 110th and 111th Congress, 43.4% of them are Republican, 7.8% are African Americans, 5.3% are Hispanic, and 16.1% are female. The average seniority is 11.3 years (13.31 years in the Senate and 10.84 in the House). Among all members, 2.5% are retiring after the current term, 19.5% are electorally vulnerable (won the last election with less than 55% votes). The average distance of ideology scale from the median member is 0.389.

Regarding bill sponsorship and cosponsorship, each observation is a member-year combination. Compared to most previous papers that use a member-Congress combination, the richer data structure enables this paper to investigate the time effect and other determinants for bill sponsorship and cosponsorship. Most variables are self-explanatory, detailed definitions can be found in the appendix. For instance, seniority is the number of years the member stayed in office in the respective chamber of Congress. Retiring is an indicator that takes 1 if the member announced retirement and did not seek re-election. Cases where a House representative runs for Senate, or other offices such as governors are excluded. This ensures that the retiring members are no longer pursuing a political career, so there could not exist a re-election or favor-exchange incentive for these members.

For bill passage, we obtain data from Thomas the Library of Congress and the Congressional Bills Project, which includes detailed information about each piece of legislation introduced during the 93rd to 113th Congress. For each bill, we have the number of cosponsors and referrals, its title and agenda, and rich information about its sponsors such as seniority, committee experience, positions, party affiliation, ideology

⁵Only the variable "passed", the number of bills introduced by a congressional member that have become law, is counted in each Congress, all other variables are measured by year.

Table 2.1: Summary statistics for 110th & 111th Congressional members

Senate:						
	Obs	Mean	Std. Dev.	Median	Min	Max
sponsor	422	22.581	19.449	16	0	121
cosponsor	422	65.244	38.528	62.5	0	253
passed	422	1.166	1.843	1	0	13
Republican	422	0.441	0.497	0	0	1
FirstClass	422	0.322	0.468	0	0	1
MajorityLeaders	422	0.076	0.546	0	0	4
MinorityLeaders	422	0.028	0.291	0	0	3
CommitteeChairs	422	1.047	2.283	0	0	10
ViceChairmen	422	0.028	0.413	0	0	6
CommitteeServices	422	8.848	3.507	8	0	30
AfricanAmerican	422	0.009	0.097	0	0	1
Female	422	0.147	0.354	0	0	1
Hispanic	422	0.028	0.166	0	0	1
seniority	422	13.315	11.674	10	0	51
retiring	422	0.038	0.191	0	0	1
vulnerable	422	0.308	0.462	0	0	1
ideologyExtreme	422	0.349	0.220	0.332	4.77E-09	1.043
state size	422	15.143	1.019	15.283	13.242	17.433
House:						
	Obs	Mean	Std. Dev.	Median	Min	Max
sponsor	1806	10.083	8.700	8	0	63
cosponsor	1806	59.451	38.204	56.5	0	319
passed	1806	0.622	1.204	0	0	14
Republican	1806	0.432	0.495	0	0	1
HouseSpeaker	1806	0.016	0.169	0	0	3
MajorityLeaders	1806	0.018	0.266	0	0	4
MinorityLeaders	1806	0.007	0.141	0	0	3
CommitteeChairs	1806	0.279	1.175	0	0	10
ViceChairmen	1806	0.003	0.100	0	0	3
CommitteeServices	1806	4.622	2.064	4	0	14
AfricanAmerican	1806	0.094	0.292	0	0	1
Female	1806	0.164	0.370	0	0	1
Hispanic	1806	0.059	0.235	0	0	1
seniority	1806	10.837	9.027	9	0	55
retiring	1806	0.022	0.145	0	0	1
vulnerable	1806	0.168	0.374	0	0	1
ideologyExtreme	1806	0.398	0.267	0.361	0	1.218
state size	1806	18.948	15.372	13	1	53

and gender. The additional data will help to answer the question whether more diligent legislators are more successful. Do members also get more bills passed while introducing or supporting more bills? We have a separate section discussing the success factors of a bill, and we also have merged it with our sponsorship data during the 110 and 111th Congress.

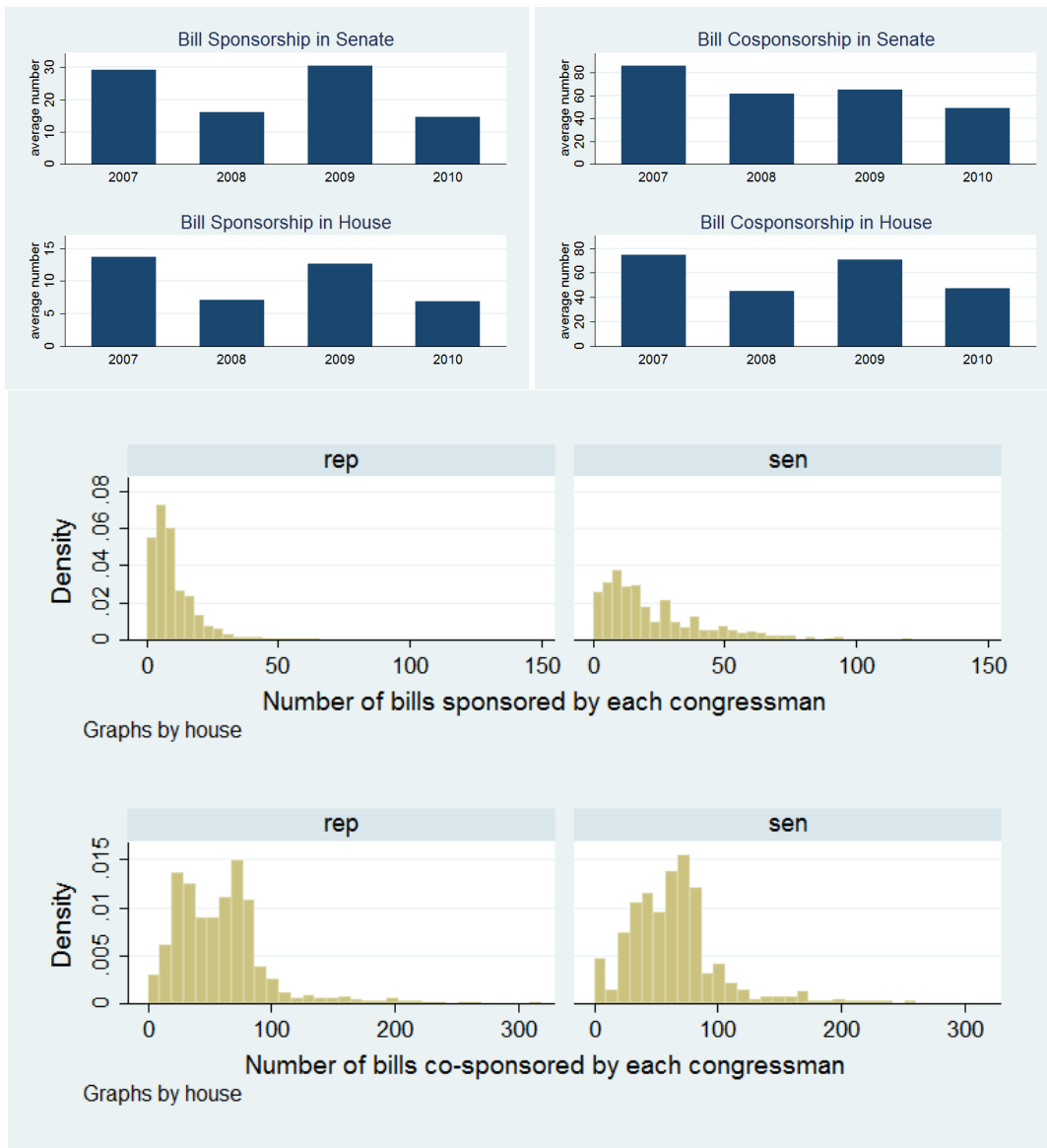
Table 2.2: Summary statistics for bills introduced 93th-113th Congress

Senate bills:						
	Obs	Mean	Std. Dev	Median	Min	Max
enacted	66305	0.042	0.200	0	0	1
cosponsors	66305	4.127	8.618	1	0	99
multi referrals	66305	0.895	0.423	1	0	11
ideology Extremity	66305	0.303	0.231	0.235	0	1.244
leader	66305	0.041	0.197	0	0	1
senator	66305	1.000	0.000	1	1	1
female	66305	0.081	0.272	0	0	1
majority	66305	0.617	0.486	1	0	1
Democratic	66305	0.563	0.496	1	0	1
chair referral	66305	0.057	0.231	0	0	1
committee chair	66305	0.028	0.166	0	0	1
ranking member	66305	0.029	0.169	0	0	1
commemorative	66305	0.086	0.280	0	0	1
House bills:						
	Obs	Mean	Std. Dev	Median	Min	Max
enacted	151969	0.038	0.190	0	0	1
cosponsors	151969	10.713	27.748	1	0	432
multi referrals	151969	1.149	0.728	1	0	18
ideology Extremity	151969	0.337	0.250	0.281	0	1.816
leader	151969	0.008	0.089	0	0	1
senator	151969	0.000	0.000	0	0	0
female	151969	0.093	0.291	0	0	1
majority	151969	0.627	0.484	1	0	1
Democratic	151969	0.603	0.489	1	0	1
chair referral	151969	0.055	0.228	0	0	1
committee chair	151969	0.015	0.122	0	0	1
ranking member	151969	0.014	0.117	0	0	1
commemorative	151969	0.067	0.250	0	0	1

As Table 2.2 shows, among the 66305 pieces of bills introduced by senators during the 93th to 113th Congress, only 4.2% of these bills introduced by the Senate are enacted into law. The percentage is slightly lower in the House: 3.8%. On average, a bill introduced by a senator has 4.127 cosponsors, 0.895 referrals and 0.057 referrals by a committee chair, while those introduced by a House representative have on average 10.713 cosponsors and 1.149 referrals.

In each Congress, as shown in Figure 2.1, sponsorship and cosponsorship levels are higher in the first session, and lower in the second sessions. The differences can be attributed to legislative context, and the

Figure 2.1: General sponsorship and cosponsorship in the Congress



fact that most members (House representatives and first-class senators) have to run for re-election during the 2nd session. Furthermore, members can effortlessly re-introduce bills that were not passed in the previous Congress in the subsequent Congress. This contributes to the high levels of legislative activity in the first sessions. The differences between sessions for cosponsorship are much smaller, mainly due to the drastically smaller efforts required for cosponsorship.

Despite the prevalence of bill sponsorship and cosponsorship, there exist Congressional members that sponsor no bills. Table 2.3 provides some descriptive statistics about these members. Comparing to Table 2.1, those who sponsored no bills are members who also cosponsored a lot fewer bills. The average number of bills cosponsored by these House members in 110th Congress is 17.95, while the average number by all members in the 110th Congress is 62.49. In general, these members are more electorally vulnerable as well. In all panels but the 2nd, members who sponsored no bills are less senior, and have less committee service compared to Table 2.1.⁶ Almost none of them is a party leader.⁷

Because of the presence of members who sponsor or cosponsor no bills, our observations accumulate from the left tail at zero. Thus, we cannot obtain unbiased estimates using OLS or the negative binomial. The latter will not yield unbiased estimates because the bills sponsored by the same member cannot be treated as independent. Thus, this paper estimates sponsorship and cosponsorship using a tobit model, which handles the structure of the data. In terms of bill passage, we adopt a refined logistic estimation for our purpose.

2.4.2 Determinants of Sponsorship and cosponsorship

In this section, we explore various determinants of bill sponsorship and cosponsorship. Controlling for party and institutional effects, demographics and other characteristics, we present the estimation for the 110th and 111th Congresses, with the dependent variable being the number of bills a member sponsored or cosponsored within one session of the Congress.

Institutional position matters. House speaker (Pelosi, D-CA) sponsored and cosponsored significantly fewer bills during the two Congresses, which is an individual effect. The majority leaders in the Senate have great impact on bill sponsorship, but in terms of cosponsorship, both majority and minority leaders

⁶The only exception is the Senate in 110th Congress. One of the two senators who had zero bill sponsorship is Trent Lott (R-MS), who is a very senior member (served 35 years).

⁷Except for the last panel of Senate for the 111th Congress, in which Joe Biden(D-DE) is the only leader and produced the 0.125 mean level, but he served as Vice President.

Table 2.3: Members who sponsored no legislation

	Obs	Mean	Std. Dev.	Median	Min	Max
Congress = 110, House						
cosponsorship	41	17.951	25.416	8	0	110
majority	41	0.585	0.499	1	0	1
seniority	41	9.122	9.349	7	0	36
CommitteeService_s	41	3.829	1.883	4	0	10
leader	41	0	0	0	0	0
retiring	41	0.122	0.331	0	0	1
freshman	41	0.366	0.488	0	0	1
vulnerable	41	0.244	0.435	0	0	1
ideologyExtreme	41	0.436	0.238	0.443	0	0.870
Congress = 110, Senate						
cosponsorship	2	0	0	0	0	0
majority	2	1	0	1	1	1
seniority	2	18	24.042	18	1	35
CommitteeService_s	2	10.5	3.536	10.5	8	13
FirstClass	2	1	0	1	1	1
leader	2	0	0	0	0	0
retiring	2	0	0	0	0	0
freshman	2	0.5	0.707	0.5	0	1
vulnerable	2	0	0	0	0	0
ideologyExtreme	2	0.401	0.040	0.401	0.372	0.429
Congress = 111, House						
cosponsorship	33	17.242	25.212	4	0	105
majority	33	0.394	0.496	0	0	1
seniority	33	10.121	10.752	7	0	38
CommitteeService_s	33	2.909	2.743	2	0	10
leader	33	0	0	0	0	0
retiring	33	0	0	0	0	0
freshman	33	0.364	0.489	0	0	1
vulnerable	33	0.121212	0.331434	0	0	1
ideologyExtreme	33	0.510	0.319	0.552	0.001	1.114
Congress = 111, Senate						
cosponsorship	16	6.125	13.063	0	0	44
majority	16	0.750	0.447	1	0	1
seniority	16	9.188	16.038	1	0	49
CommitteeService_s	16	2.750	3.856	0	0	12
FirstClass	16	0.250	0.447	0	0	1
leader	16	0.125	0.342	0	0	1
retiring	16	0	0	0	0	0
freshman	16	0.75	0.447	1	0	1
vulnerable	16	0.375	0.500	0	0	1
ideologyExtreme	16	0.292	0.228	0.217	0.008	0.725

Table 2.4: Determinants of Bill Sponsorship and Cosponsorship

	Senators		House Representatives	
	sponsor	cosponsor	sponsor	cosponsor
Institutional positions:				
MajorityLeaders	8.199*** (2.946)	-0.101 (8.745)	-0.72 (1.086)	-9.050*** (0.735)
MinorityLeaders	-0.402 (0.660)	-3.291*** (1.099)	0.241 (0.203)	-5.765*** (0.721)
CommitteeChairs	2.272*** (0.640)	0.663 (1.023)	1.021*** (0.387)	-1.953* (1.000)
ViceChairmans	3.466*** (1.233)	-1.724 (2.177)	-2.631** (1.265)	7.873** (3.115)
CommitteeServices	1.428*** (0.303)	1.268* (0.684)	0.491*** (0.140)	1.044** (0.471)
Member characteristics:				
Republican	-5.974** (2.936)	-3.153 (5.187)	-5.714*** (1.382)	-30.51*** (5.405)
AfricanAmerican	8.786* (4.786)	14.62 (15.970)	1.072 (1.310)	17.55*** (4.252)
Female	9.198*** (3.537)	14.10** (6.139)	2.023** (0.878)	5.475* (3.226)
Hispanic	7.754 (8.946)	1.626 (9.218)	-0.727 (1.434)	9.586 (6.904)
ideologyExtreme	1.313 (5.271)	11.73 (8.212)	5.199** (2.334)	47.53*** (9.686)
seniority	-0.018 (0.117)	0.0128 (0.214)	0.0703 (0.049)	-0.105 (0.139)
sponsorship		1.052*** (0.172)		1.565*** (0.162)
Electoral factors:				
FirstClass	0.144 (2.232)	-0.712 (4.130)		
retiring	-1.115 (2.184)	6.063 (4.719)	-2.368*** (0.885)	-1.517 (3.066)
freshman	-3.398 (2.667)	0.134 (4.885)	-2.861*** (0.748)	-19.20*** (2.772)
vulnerable	-1.873 (2.154)	-0.907 (4.507)	1.807*** (0.634)	1.604 (2.421)
state size	3.705*** (1.046)	2.63 (1.973)	0.00456 (0.018)	0.0378 (0.082)
year fixed effects	yes	yes	yes	yes
Constant	yes	yes	yes	yes
Observations	422	422	1,806	1,806

Robust standard errors in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

cosponsor significantly less bills in the House. This might be because high quality sponsors have a lower incentive to cosponsor others' bills for position-taking or re-election. For instance, Davidson and Oleszek (2005) suggest that party leaders are reticent to cosponsor bills. Committee chairmanship is also powerful in this regard. Committee chairmen sponsor more bills in both chambers, vice chairman sponsor more in the Senate and cosponsor more in the House. Finally, committee service has a persistent positive impact on sponsorship and cosponsorship for both the House and Senate.

Being a first-class senator (meaning their current term ends in two years) does not significantly affect sponsorship or cosponsorship levels. This may be attributed to the fact that being in the first-class itself is not a good predictor of the re-election pressure facing senators.

In terms of demographics, Epstein, Fowler, and O'Halloran (2007) have associated cosponsorship with minority group status and party affiliation. This paper finds a higher sponsorship level for African American members in the Senate. This could be a pure individual effect because Obama is the only senator in this category for the 110th Congress, and Burriss filled his vacancy for the 111th Congress. African American members do cosponsor more bills in the House. Hispanic members do not significantly differ in their legislative activities. These findings differ from Rocca and Sanchez (2008), where they find Black and Latino legislators sponsor and cosponsor significantly fewer bills in the Congress. The findings in this paper are consistent with their findings in terms of gender, in particular, that female members display both higher levels for sponsorship and cosponsorship. Garand and Burke (2006) also find that female members cosponsor more bills in the House.

This paper utilizes the first dimension of DW-NOMINATE scores to measure member's ideology. The variable "ideologyExtreme" is calculated as the distance between each member's DW-NOMINATE score and the median score in the member's chamber during a specific Congress. In the Senate, ideologically more extreme members do not seem to sponsor more bills. The effect of ideology extremity is much more pronounced and significant in the House. This finding is consistent with Garand and Burke (2006), which uses the absolute values of the DW-NOMINATE score and finds a positive effect on sponsorship and cosponsorship in the House. Campbell (1982) also finds that more extreme members cosponsor more bills in the House, but not the Senate.

Seniority is a difficult issue. Empirical research has found mostly a negative or insignificant relationship between seniority and cosponsorship. Campbell (1982) finds a negative relationship between seniority and

cosponsorship but only in the House. Koger (2003) finds a negative but decreasing impact of seniority on cosponsorship. Garand and Burke (2006) find a positive effect on sponsorship and a negative effect on cosponsorship. In this paper, we find no significant effect of seniority on bill sponsorship or cosponsorship during the 110th and 111th Congress.

To control for the level of general legislative activity, we include bill sponsorship (number of bills each member sponsored) and impending retirement as determinants for bill cosponsorship. As a measure of general effort level, bill sponsorship explains the cosponsorship level, indicating that more diligent members (drafting more bills themselves) cosponsor more actively as well. This finding is consistent with Campbell (1982) and Harward and Moffett (2010). On the other hand, retiring members sponsor fewer bills, but the effect is only pronounced in the House. Koger (2003) included a dummy variable for retirement in OLS estimation for each Congress, and found that the effect was negative but insignificant. Note again that instead of measuring by each Congress, this paper uses year as the measured unit of time, and a retiring member is only coded as retiring during the last year of the member's term (the 2nd session). This produces more precise estimates, especially when the levels of sponsorship and cosponsorship significantly differ between the two sessions of each Congress.

Cosponsorship is also associated with electoral vulnerability (Campbell (1982); Rocca and Sanchez (2008)), particularly for the freshman class (Koger (2003)). Following Engstrom and Vanberg (2010), "vulnerable" is defined to be 1 if the member won the most recent general election with less than 55% vote. Harward and Moffett (2010) find a negative relationship between recent general election vote and a senator's cosponsorship. Electorally safe members have a lower incentive to use cosponsorship to advertise for or guard against attacks by others. This paper does not find evidence supporting this perspective.

Several additional controls are included in the estimation. We control for the local demand by including a state size measure, the log of state population for senators and the number of House seats for representatives. We expect state size to positively affect sponsorship. Koger (2003) also finds that larger state size is positively associated with cosponsorship in the House, where size is defined as the number of House members (inclusive) in a member's state, which approximates state population. This can be explained as larger number of constituents call for more legislation because of higher local demand. Senators from larger states would have to sponsor more bills addressing local issues. Since House representatives are responsible only for their congressional district, the effect is more difficult to observe. One can also see the impact from

party, that Republican members sponsor and cosponsor less than their Democratic counterparts. Finally, the 2nd sessions of the 110th and 111th Congress (year 2008 and 2010) are included as time fixed effects.

Table 2.5: Marginal Effects for Sponsorship and Cosponsorship

	Senate			House		
	Sponsorship			Sponsorship		
	[0,9]	[9,13]	[31,121]	[0,4]	[4,13]	[13,63]
MajorityLeaders	1.054***	3.522***	2.585***	-0.088	-0.273	-0.262
CommitteeChairs	0.292***	0.968***	0.716***	0.124***	0.387***	0.371***
ViceChairmen	0.446***	1.484***	1.093***	-0.32**	-0.998**	-0.957**
CommitteeServices	0.184***	0.618***	0.450***	0.060***	0.186***	0.179***
AfricanAmerican	1.129**	3.997**	2.771*	0.13	0.407	0.390
Female	1.182***	4.172**	2.900**	0.246**	0.768**	0.736**
state size	0.476***	1.583***	1.168***	0.0005	0.002	0.002
	Cosponsorship:			Cosponsorship:		
	[0,39]	[39,80]	[80,253]	[0,32]	[32,77]	[77,319]
MajorityLeaders	-0.022	-0.041	-0.033	-1.695***	-4.044***	-2.804***
CommitteeChairs	0.146	0.271	0.219	-0.366**	-0.873**	-0.605*
ViceChairmen	-0.38	-0.705	-0.57	1.474**	3.518**	2.440**
CommitteeServices	0.280*	0.518*	0.419*	0.196**	0.467**	0.324**
AfricanAmerican	3.224	5.974	4.829	3.287***	7.844***	5.440***
Female	3.110**	5.762**	4.658**	1.025*	2.447*	1.697**
state size	0.58	1.075	0.869	0.007	0.017	0.012

Marginal effect computed by Delta-method

** * $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 2.5 shows the marginal effects of selected variables. In each panel, the cut-off levels for sponsorship or cosponsorship are the 25th and 75th percentiles. For instance, for senators who sponsored 9 to 13 bills, a change in majority leader status causes a 3.552 increase in the number of bills sponsored. The effect is largest in the middle category (25th to 75th percentile). As in most cases, the effect of committee chairmanship is only negative in the House in terms of cosponsorship. This is consistent with the hypothesis that high quality members have a lower incentive to cosponsor. Also, committee service has positive effects in all cases and percentiles. African American senators (namely, Obama and Burriss) sponsor more bills in the Senate, but the same does not apply to the House. However, African American members of the House did cosponsor more bills. Female senators between the 25th to 75th percentile sponsor 4.172 more bills and cosponsor 5.762 more bills than comparable male senators, while female House representatives sponsor 0.768 more bills and cosponsor 2.447 more. Consistent with Table 2.4, state size has its effect only in the Senate.

2.4.3 Predicting success of legislator and legislation

In this subsection, we first discuss the success of a bill. We explore the factors that help a bill to pass both chambers and finally be enacted into law. As mentioned earlier, the chances for a legislation to be signed into law is rather low. From the 93rd to the 113th Congress, the average success rate is 4%. With the rarity of events in terms of bill passage, maximum likelihood estimation of the traditional logistic model suffers from small-sample bias. We therefore adopt King and Zeng (2001)'s improved logistic methods for rare events, and present our preliminary findings in Table 2.6.

Table 2.6: Successful legislation: Predicting bill passage

	all	senate	house
cosponsors	0.00565*** (0.000)	0.0228*** (0.002)	0.00503*** (0.000)
muti referrals	0.122*** (0.014)	0.0971 (0.061)	0.126*** (0.014)
ideology Extremity	-0.292*** (0.056)	-0.407*** (0.117)	-0.316*** (0.066)
leader	0.401*** (0.075)	0.246*** (0.092)	0.582*** (0.129)
senator	0.105*** (0.026)		
female	-0.318*** (0.045)	-0.590*** (0.094)	-0.216*** (0.051)
majority	0.948*** (0.032)	0.762*** (0.056)	1.009*** (0.040)
Democratic	-0.210*** (0.027)	-0.275*** (0.043)	-0.167*** (0.037)
chair referral	0.0232 (0.048)	-0.0251 (0.085)	0.0464 (0.059)
committee chair	0.871*** (0.055)	0.537*** (0.089)	1.173*** (0.069)
ranking member	-0.0874 (0.103)	0.0392 (0.123)	-0.372* (0.199)
commemorative	1.235*** (0.031)	0.745*** (0.058)	1.501*** (0.036)
Constant	-4.058*** (0.044)	-3.680*** (0.099)	-4.191*** (0.051)
Observations	218,274	66,305	151,969

Robust standard errors in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

In Table 2.6, the first column includes all available bills during the 93rd to 113th Congresses, where the second and third column focuses on the Senate and the House bills respectively. Results show that the more cosponsors supporting a bill, the higher the chance that it will become law. This is consistent

with the bandwagon effect, that the number of cosponsors serves as a signal of the bill's popularity when it comes to a vote, assuming that the cosponsors would vote for the bills that they cosponsored. Similarly, the number of referrals also increases a bill's chance of success. Ideological extremity is measured using the first dimension of DW-NOMINATE score, where it is calculated by the distance of the bill's sponsor's DW-NOMINATE score to the median member's score at the time of the Congress when that bill is introduced. And not surprisingly, sponsors at either ends of the ideology scale are less likely to have their bills passed. Bills sponsored by party leaders, senators, majority members and committee chairs all have a higher chance of success, where female members are relatively disadvantaged. Ranking members and committee chair referrals do not seem to differ in terms of bill passage. Lastly, commemorative bills such as naming post offices and bestowing congressional gold medals are easier to pass.

Secondly, we discuss the success of legislators. Instead of focusing on the success rate as in the early research (Moore and Thomas (1991)), we use the number of bills that are enacted into law as the measure of success for legislators. During the 110th and 111th Congress, only 40% of all congressional members managed to have at least one bill passed in a two-year term. The most successful legislator had 14 bills enacted into law (Rangel, NY), while the most productive legislator sponsored 121 bills (Feinstein, CA).

We proceed using the number of enacted bills of a congressional member as dependent variable, and for the distribution of which the tobit model is employed. Table 2.7 has six columns, the first three consider the senators, House representatives, and the Congress altogether. The next three columns add a set of additional control variables into the model, but they are mostly insignificant. Specifically, more bills sponsored and cosponsored leads to more bills been passed, while the effect of sponsorship is much greater than the latter. The strongest predictor of bill passage is committee chairmanship, which is consistent across chambers. Longer service (seniority) in the Congress also contributes to bill passage in the sense of reputation and expertise building. Sponsors located at either ends of the ideology scale have a lower chance of getting their bills enacted, showing strong negative effects in Table 2.7.

In sum, the number of bills sponsored, committee chairmanship and seniority are positively related to how many bills one can pass, and ideology extremity is negatively related to legislative success. Other positional factors, demographics and election margin, do not have any significant effects.

Table 2.7: Successful Legislators: Predicting the number of legislation enacted into law

	Senate	House	Congress	Senate add	House add	Congress add
sponsor	0.0368*** (0.010)	0.0486*** (0.011)	0.0400*** (0.006)	0.0366*** (0.011)	0.0499*** (0.011)	0.0439*** (0.007)
cosponsorOriginal	0.0115** (0.005)	0.00197 (0.002)	0.00469** (0.002)	0.0111** (0.005)	0.00204 (0.002)	0.00446** (0.002)
FirstClass				0.248 (0.445)		0.174 (0.429)
senator						-0.193 (0.318)
MajorityLeader_s	0.577* (0.331)	-0.311* (0.185)	0.23 (0.299)	0.643* (0.355)	-0.344* (0.199)	0.229 (0.317)
MinorityLeader_s				0.0681 (0.141)	-3.899 0.000	-0.203 (0.305)
CommitteeChair_s	0.308*** (0.093)	0.525*** (0.122)	0.425*** (0.079)	0.314*** (0.094)	0.532*** (0.129)	0.435*** (0.084)
ViceChairman_s				-0.0108 (0.165)	-0.579 (0.404)	-0.26 (0.168)
CommitteeService_s				-0.00323 (0.069)	-0.0362 (0.046)	-0.0171 (0.038)
AfricanAmerican				0.046 (1.090)	0.178 (0.381)	0.109 (0.404)
Female				0.426 (0.494)	-0.154 (0.264)	-0.015 (0.233)
Hispanic				-0.449 (0.780)	-0.075 (0.364)	-0.122 (0.341)
seniority	0.0328 (0.025)	0.0253** (0.010)	0.0277*** (0.010)	0.0342 (0.035)	0.0247** (0.012)	0.0296** (0.013)
retiring				-0.437 (0.716)	0.333 (0.375)	0.113 (0.337)
freshman				-0.228 (0.669)	0.364 (0.267)	0.23 (0.262)
vulnerable				0.441 (0.478)	-0.32 (0.242)	-0.0931 (0.220)
ideologyExtreme	-1.982** (0.852)	-1.678*** (0.341)	-1.764*** (0.322)	-1.776* (0.939)	-1.639*** (0.346)	-1.733*** (0.329)
state_size				-0.0809 (0.231)	0.00099 (0.006)	0.00131 (0.006)
Year Effects	Yes	Yes	Yes	Yes	Yes	Yes
Constant	Yes	Yes	Yes	Yes	Yes	Yes
Observations	422	1,806	2,228	422	1,806	2,228

2.5 Results and Conclusion

This paper first examines bill sponsorship and cosponsorship as legislating output in the 110th and 111th U.S. Congress, and presents new evidence on institutional position and member characteristics. It further investigates the success of legislation and legislators, using data from the 93rd to 113th Congresses, and finds cosponsorship to be an important factor explaining bill passage, along with positional factors such as majority status, committee chairmanship.

In terms of legislative output, party matters in that Republican members sponsor and cosponsor less legislation, especially in the House. Members in prestigious positions (e.g., majority or minority leaders, committee chairman) are more productive in sponsoring but cosponsor a lot less. Longer committee service encourages legislative activity in general. Demographics play a role. African Americans cosponsor more in the House, while female members have persistent higher levels of bill sponsorship and cosponsorship in both chambers. As for the general efforts level, sponsorship is positively related to cosponsorship levels, and retiring House members sponsor significantly fewer bills. Ideologically more extreme House members consistently sponsor and cosponsor more bills in the House. And during every second session of Congress, members have lower legislative activity.

As for the success of legislation and legislators, bills having more cosponsors and multiple referrals, as well as majority, leader, committee chair sponsors are easier to pass. On the other hand, bills having female and ideologically more extreme sponsors have a lower change of passage. For a legislator, the more legislation he or she sponsors and cosponsors, the more of his or her bills will be enacted. Positional advantages such as majority leaders and committee chairs benefit their legislative success, as well as expertise or reputation gains from seniority. Extreme ideology hinders the success of legislators.

Several weakness of the paper are worth noting. First, this paper uses the total bill counts as the measure of legislative output. While bills addressing different issues may differ in the time and resources required, this point is better addressed in the bill passage part of this paper, where we have the agenda for each bill, and whether it is commemorative. Assuming as any rational player, congressional members differ in their expertise and resources, choose to specialize in certain policy areas and sponsor bills that maximize their benefits, the aggregate bill counts may mask the differences in resources invested or the legislative productivity. Second, bills that were not passed in the previous Congress may be modified and re-submitted in the subsequent Congress, which may dilute the sponsorship and cosponsorship efforts that members actually

incur during a given year, especially for the first session. Thirdly, for the two Congresses in our lawmaking output estimation, the Democratic party holds majority status in both chambers, which eliminates the possibility to investigate the effects of majority status and its interactions with the party effects.

Table 2.8: Variable Definitions

sponsor:	Number of bills the member sponsored within a year.
cosponsor:	Number of bills the member cosponsored within a year.
Republican:	1 if the member belongs to the Republic party, 0 otherwise.
FirstClass:	1 if the member is a senator who is in the first class, i.e. facing a re-election within 2 years. 0 otherwise.
CommitteeChairs:	5 if the member is the only chairman for a specific committee, 4 if the 1st chairman, 3 if the 2nd chairman, 2 for the 3rd chairman, 1 for the the acting chairman. Then sum over all chommittees to get the accumulated chairmanship by ranks.
ViceChairmen:	3 if the member is the only vice chairman for a committee, 2 if the member is the 1st vice chairman, 1 if the member is the 2nd vice chairman.
MajorityLeaders:	4 if the member is majority leader/whip, 3 if the only majority leader/whip, 2 if the 1st majority leader/whip, 1 if the 2nd majority leader/whip.
MinorityLeaders:	4 if the member is minority leader/whip, 3 if the only minority leader/whip, 2 if the 1st minority leader/whip, 1 if the 2nd minority leader/whip.
CommitteeServices:	1 if the member has temporary assignment for a specific committee, 2 for the only period of service; 3 for the First period of service; 4: Second period of service; 5:Third period of service; 0: Inapplicable; no committee assignments. Then sum over all committees to get the accumulated committee services. *Similar treatment applies from CommitteeChairs to CommitteeeServices.
AfricanAmerican:	1 if the member is a African American. 0 otherwise.
Female:	1 if the member is female. 0 otherwise.
Hispanic::	1 if he member has Hispanic/Latino origin. 0 otherwise.
seniority:	Numbers of consecutive years served in the Senate (or House) if the member is a senator(or a representative) at the time.
freshman:	1 if the member is in his or her first year in Congress, 0 otherwise.
freshmanClass:	1 if the member has been a new member in the 110th or 111th Congress, 0 otherwise.
Vulnerable:	1 if the member won the recent election with less than 55% vote.
ideologyExtreme:	The difference between the member's 1st dimension DW-NOMINATE score and the median score in the member's chamber.
retiring:	1 if the member is retiring and seeks no reelection by the end of the current session, 0 otherwise.
state size:	The log of state population if the member is a senator; Number of representative seats in the member's state if the member is in the House.
enacted	1 if the legislation finally became public law; 0 otherwise.
cosponsors	Number of cosponsors a specific legislation has.
multi referrals	Number of referrals a specific legislation has.
majority	1 if the sponsor of the legislation is in majority party at time of the legislation introduction, 0 otherwise.
chair referral	1 if the legislation has been referred by a committee chair, 0 otherwise.
ranking member	1 if the sponsor of the legislation is a ranking member in a committee.
commemorative	1 if the legislation is commemorative, 0 otherwise.

Chapter 3

Digging in the pork barrels: Self interests and retirement effect on Congressional earmarks

3.1 Introduction

For centuries, farmers indicated ownership of their livestock by cutting notches or marking in the animal's ear. Earmark is also a political term used in countries such as United States and South Africa. Similar to a mark for farm property, a legislative earmark directs a specified amount of money to a particular organization or project, mostly in the legislator's home state or district, which can be and oftentimes have been advertised as evidence of achievement.

Earmarks¹, the legislative (especially congressional) provisions that direct approved funds to specific projects, have caught much attention and raised controversies in recent years. During a single week in September 2008, three major network news channels (CNN, MSNBC, Fox News) mentioned earmarks 91 times, which is almost as often as Afghanistan, which was mentioned 113 times (Alterman and Zornick (2008)).

According to CAGW (Citizen Against Government Waste), since the early 1990s, the spending on earmarks has been steadily rising, reaching 29 billion in 2006. The huge spending on earmarks has aroused public anger so the legitimacy of earmarks has been under constant attack. Earmarks are financed through tax revenues from all constituencies, circumventing merit-based or competitive allocation process and benefit only selected constituencies. As Weingast, Shepsle, and Johnsen (1981) point out, factors such as the variance between political and economic costs and the districting mechanism tend to produce "overly large and inefficient projects". The Gravina Island Bridge, commonly known as the "Bridge to Nowhere", is one well-cited example of earmark. It is a proposed bridge to replace the ferry that connects a town in Alaska

¹The Federal Office of Management and Budget defines earmarks as funds provided by the Congress for projects, programs, or grants where the congressional direction circumvents executive branch merit-based or competitive allocation processes, or specifies the location or recipient, or otherwise curtails the ability of the Executive Branch to manage its statutory and constitutional responsibilities pertaining to the funds allocation process.

with Gravina Island, the latter having only 50 residents. The bridge was projected to cost \$398 million.

The defense for earmarks is that directing money to particular purposes is a core constitutional function of the Congress, which has the authority to appropriate federal revenue. Although earmarks circumvent the usual competitive or merit-based allocation process, the executive agencies are not guaranteed to produce a superior allocation than that of Congress, assuming that the allocation is made by the executive branch and not made by the Congress. Therefore, considering the difficulties evaluating the quality and validity of earmarks or arguing over the relative efficiencies of legislative bodies, this paper intends to cast an alternative light on this matter by exploring the behavioral responses of retirement on earmarking. If most earmarks are truly for the benefit of constituents or the general public, then the amount of earmarks requested should not display much difference in the last year before retirement. If instead, earmarks are used by politicians for self interest such as re-election or favor exchange, then such incentives should be significantly reduced immediately before their retirement.

We employ detailed data on congressional earmarks from 2008 to 2010, supplemented by a rich data set of member characteristics and electoral features to investigate the factors impacting the distribution of earmarks. Within different categories of earmarks, we find consistent evidence that earmarks are affected by retirement, party difference, institutional position, experience and constituent demand. These results provide insight into that earmark allocation mechanism in the Congress and policy implications for earmark reforms.

3.2 Data and empirical results

Earmarks have also been informally addressed as “pork”, which refers to funding for government programs whose benefits are concentrated in a particular area but whose costs are shared among all taxpayers. Public works projects, national defense projects, and agricultural subsidies, are commonly cited examples of earmarks.

The following figures from CAGW show the number of pork projects, and the amount of pork-barrel spending from 1991 to 2012.² Since the early 1990s, the amount of pork barrel projects has been steadily

²The Citizens Against Government Waste (CAGW) has seven criteria for an item to be categorized as pork: Requested by only one chamber of Congress; Not specifically authorized; Not competitively awarded; Not requested by the President; Greatly exceeds the President’s budget request or the previous year’s funding; Not the subject of congressional hearings; Or serves only a local or special interest. In many cases the two terms earmark and pork barrel projects are used interchangeably, and so does this paper.

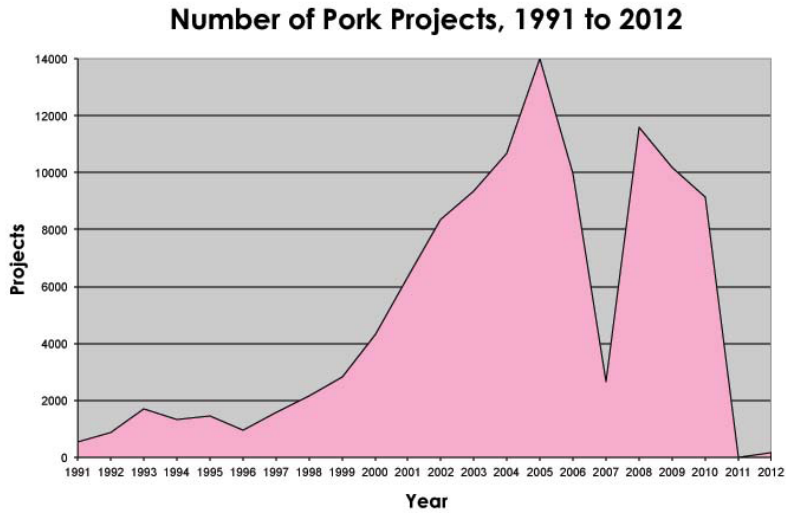


Figure 3.1: General trend of the number of Pork projects

rising, reaching 29 billion in 2006. A drastic drop in the number of projects and the amount spending in 2007, when a one-year moratorium was imposed by the Congress for all spending bills except defense and homeland security. But 2658 earmarks were still passed in 2007, totaling \$13.2 billion that year. A moratorium for earmarks was imposed for fiscal year 2011 and 2012 as well.

3.2.1 Description of data

Though scholars have devoted considerable efforts in analyzing the mechanism behind distributive politics in legislative settings, comprehensive empirical investigations are not readily feasible because of the lack of transparency regarding earmarks. The public did not have access to earmark records until the late reforms in 2007. In 2007, the House adopted a rule that it would not consider a bill if the sponsor information of its earmarks is not publicly available. The Senate took similar actions requiring the disclosure of earmark sponsors, purpose, recipient and declaration of no immediate financial interest for the sponsors (Doyle (2011)).

Due to the fact that a moratorium was imposed for fiscal year 2007, 2011 and 2012, this paper analyzes earmark data for the fiscal years 2008 to 2010, which spans the 110th and 111th U.S. Congress³.

We obtain and compile the earmark data from Taxpayers for Common Sense (TCS⁴) and Office of Man-

³House Republicans later unanimously adopted a ban on earmarks for the 112th Congress, and the president stated that he would veto any legislation that contains an earmark on January 25, 2011

⁴TCS defines earmarks as legislative provisions that set aside funds within an account for a specific program, project, activ-



Pork-Barrel Spending, 1991 to 2012

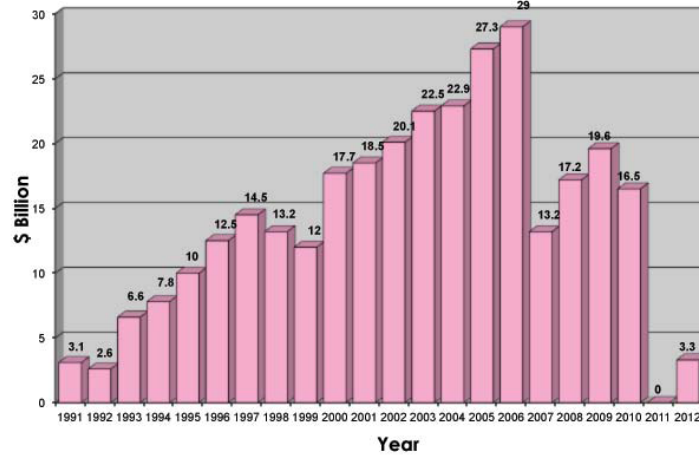


Figure 3.2: General trend of Pork projects spending

agement and Budget (OMB). Bibliography information for each member of the Congress (MC hereafter) is obtained from the Congressional Biographical Directory, then matched to each member’s earmarking record. State and Congressional district population is retrieved from the U.S. Census Bureau.

Table 3.1: Definitions for Earmark Measures

e1	The amount of earmarks that a MC requested solely (in million dollars)
e2	The amount of earmarks requested with other congressmen (in million dollars)
n1	The number of earmarks that the MC requested solely
n2	The number of collaborative earmarks requested with other congressmen
E1	$E1=e1$, the amount of individual earmarks
E2	$E2=e1+e2$, the amount of solo and collaborative ⁵ earmarks requested
N1	$N1=n1$, the number of individual earmarks
N2	$N2=n1+n2$, the number of individual and collaborative earmarks ⁶

Each observation is a MC’s (senator or representative) earmarking record in one specific year. We have several measures for earmark activities in terms of the number and amount, classified by the earmarks being requested individually, with other congressmen, or with the President. In Table 3.1, we briefly explain the definition and relationship of several measures of earmarks used in this paper. Our main interest lies in the individual and collaborative category (E2, N2, etc) of earmarks.

Several indicators are included to describe the characteristics of Congressmen: “Member” identifies the MC as a member in the Senate or House Committee on Appropriations, and “Chair” indicates chairmanship
ity, institution, or location. These measures normally circumvent merit-based or competitive allocation processes and appear in spending, authorization, tax, and tariff bills.

Table 3.2: Descriptive Statistics For Earmark Measures

	obs	mean	std dev	median	min	max
House representatives:						
e1	1336	6.443	12.088	3.007	0	159.941
e2	1336	20.839	22.386	14.686	0	215.538
n1	1336	8.563	8.816	7	0	67
n2	1336	13.420	10.925	11	0	69
Senators:						
e1	306	25.950	53.856	6.751	0	387.412
e2	306	128.933	117.138	110.184	0	1070.879
n1	306	17.931	25.638	8	0	150
n2	306	76.801	56.497	68	0	317

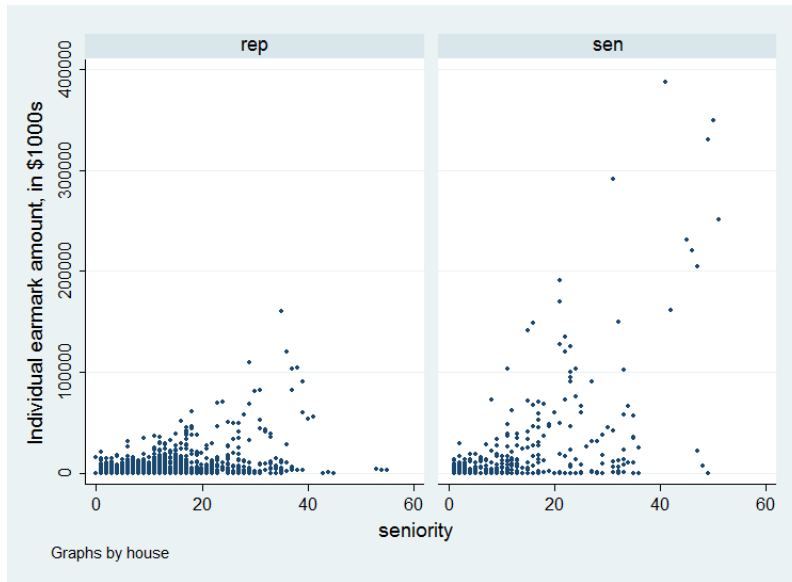


Figure 3.3: The relationship between seniority and the amount of earmarks ($e1$)

of a Senate or House Appropriations subcommittee. “Seniority” is the number of years a Congressional member has stayed in his or her current chamber. “Republican”, “senator” and “retiring” are indicators with their literal meanings. “Population” is included to control for locational fixed effects.

Figure 3.3 and Figure 3.4 illustrate how the amount and number of earmarks varies according to seniority. Both chambers (rep and sen in the figures) show a positive relationship between seniority and earmarks, although the Senate has longer seniority and higher earmark outputs on average.

In Table 3.3 we summarize the characteristics of all MCs in our data. Defined as above, seniority measures the number of years a MC has stayed in office at the time of this investigation, which is longer in general for senators than for representatives. One exception is the most senior member in the House

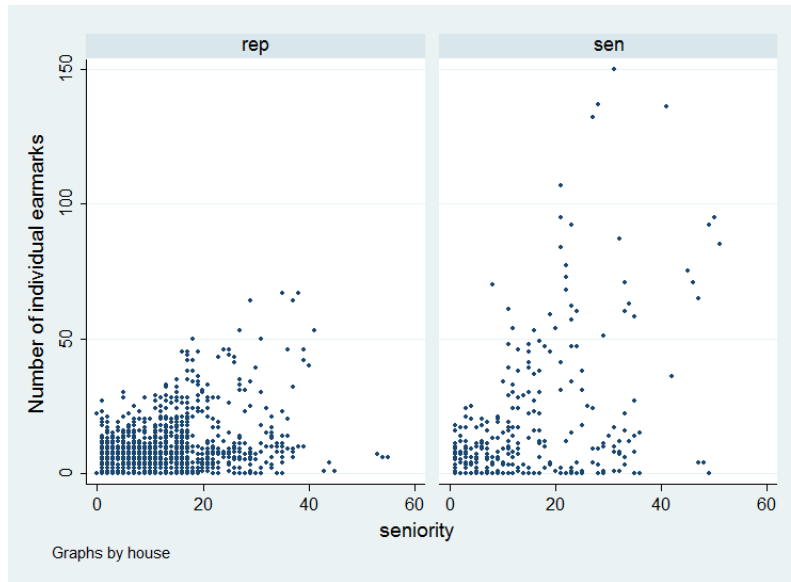


Figure 3.4: The relationship between seniority and the amount of earmarks ($n1$)

(Dingell, D-MI), who has been in office for 55 years. The average length of seniority is 14.3 and 11.7 years respectively. Coalition is defined to be the summation of seniority of all fellow MCs (including himself) in a MC’s home state for his chamber. The partisan voting index (PVI), is a measure for how strongly each district leans towards a certain party on a national level. We define PVI to be positive if a district leans towards the Democratic party.⁷ For House representatives, the most Democratic districts (district 15 and 16 in New York) have a PVI of 43. For senators, their PVI for a state as a whole is less extreme, ranging from the most Republican to the most Democratic states as negative 20 to positive 13. Population is the natural log of a senator’s home state population, and the natural log of the per-seat home state population for a representative (state population divided by the number of House seats).

Table 3.4 describes the indicator variables for several MC characteristics. The variables in this table take value 1 if the MC is a chairman, a senator,⁸ retiring, Hispanic, or in a swing state retiring in that year, and zero otherwise. Specifically, “member” denotes the membership in the Committees on Appropriations (both chambers), which have jurisdiction over all discretionary spending legislation. The Committee on Appropriations is responsible for passing appropriation bills along with its counterpart in the other cham-

⁷PVI is calculated based on the past two presidential election outcomes. For instance, if Congressional district 2 in Arizona has a voting share for the Democratic party 5% less than the national average during the past two presidential elections, that results in a PVI of negative 5.

⁸Due to reasons such as special elections, one seat could have two consecutive senators, which produces more than 100 senators in one session of the Congress. The same situation applies to the House but more frequently. Thus, the House has more than 435 representatives in one given year.

Table 3.3: Descriptive Statistics for Congressional Members (I)

House representatives:						
	obs	mean	std dev	median	min	max
seniority	1336	11.737	8.899	11	0	55
coalition	1336	37.380	18.536	36	0	110
PVI	1336	1.055	14.595	-2	-29	43
population	1336	13.456	0.211	13.463	10.895	15.131
Senators:						
seniority	306	14.382	11.553	11	1	51
coalition	306	29.507	17.812	26	4	80
PVI	306	-2.464	8.863	-2	-20	13
population	306	15.157	1.017	15.327	13.242	17.433

ber. “Chair” indicates the chairman of sub-committees on Appropriations,⁹ which is commonly known as “cardinals”, with substantial powers. Members are marked as “retiring” in their last year in Congress if they announced retiring and seek a political career no further.¹⁰ “Swing” is defined to be one if the PVI of the state equals zero, and zero otherwise.

Table 3.4: Descriptive Statistics for Congressional Members (II)

	member		chair		senator		retiring		majority	
	0	1	0	1	0	1	0	1	0	1
2008	453	94	523	24	446	101	522	25	291	256
2009	460	90	525	25	447	103	550	0	256	294
2010	455	90	520	25	443	102	515	30	222	323
	Republican		vulnerable		swing		Hispanic		female	
	0	1	0	1	0	1	0	1	0	1
2008	292	255	440	107	534	13	517	30	461	86
2009	296	254	489	61*	538	12	520	30	463	87
2010	325	220	443	102*	534	11	517	28	454	91

3.2.2 Empirical Findings

Since some Congressional members do not seek any earmarks (House Speaker John Boehner for instance), a lot of observations are accumulated at zero. This paper uses tobit estimation for the earmark data.

⁹The Committee on Appropriations has 12 sub-committees: Agriculture, Rural Development, Food and Drug Administration, and Related Agencies; Commerce, Justice, Science, and Related Agencies; Defense; Energy and Water Development; Financial Services and General Government; Homeland Security; Interior, Environment, and Related Agencies; Labor, Health and Human Services, Education, and Related Agencies; Legislative Branch; Military Construction, Veterans Affairs, and Related Agencies; Subcommittee on the Department of State, Foreign Operations, and Related Programs; Transportation, Housing and Urban Development, and Related Agencies.

¹⁰Retiring members are checked individually to ensure they are indeed retiring from politics and seek no reelection or any other seat in government.

Table 3.5: Determinants for Individual and collaborative Earmarks (E2)

	(1)	(2)	(3)	(4)
retiring	-20.82*** (7.073)	-25.18*** (7.418)	-24.69*** (7.406)	-24.57*** (7.533)
seniority	1.800*** (0.398)	1.386*** (0.330)	1.032*** (0.396)	1.106*** (0.394)
majority	7.055*** (2.337)	6.475*** (2.282)	6.239*** (2.296)	6.208*** (2.291)
senator	125.6*** (11.17)	118.8*** (10.25)	122.0*** (10.68)	95.81*** (14.62)
member		52.32*** (8.202)	53.03*** (8.153)	53.29*** (8.030)
coalition			0.295** (0.141)	0.291** (0.140)
population				15.24*** (5.014)
year fixed effects	Yes	Yes	Yes	Yes
constant	Yes	Yes	Yes	Yes
Observations	1,642	1,642	1,642	1,642

Robust standard errors in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

We explore the effects of various characteristics of Congressional members on their earmark activities, and find similar evidence across tables that make good sense. Members of Appropriation subcommittees have requested significantly more earmarks. Each additional year (measured by seniority) in the Congress also helps to explain the request for more earmarks. In general, senators request more earmarks than their House counterparts. Most interestingly, those who were about to retire request less spending on earmarks. This may reflect changes regarding the retiring Congressmen from the lower value in terms of favor exchange or future partnership. The size of coalitions¹¹ and population are also statistically significant.

Table 3.5 reports the determinants for collaborative earmarks $E2$ (individual and collaborate earmarks in millions). Retiring members have a strong and consistent lower amount of earmarks during their last year in Congress. One more year of seniority produces consistently more earmarks, while being in the president’s party (being “majority”¹²) also encourages earmarks. Senators request a significantly higher amount of earmarks than House representatives, and being a member of the Committee on Appropriations also leads to more earmarks. Coalition, which is the within-state measure of aggregate seniority, shows up with a positive impact on earmarks, as well as population.

¹¹Aggregate seniority of all congressman (of the same party) in the congressional member’s home state, measured in years, excluding the congressional member himself or herself.

¹²The Democratic party controlled a majority in both chamber during the 110th and 111th Congress. We therefore use “majority” to indicate a MC being in the president’s party.

Table 3.6: Determinants for collaborative Earmarks (e2)

	(1)	(2)	(3)	(4)
retiring	-15.17** (6.555)	-17.55** (6.850)	-17.01** (6.850)	-16.71** (7.125)
seniority	0.770*** (0.297)	0.550** (0.265)	0.154 (0.350)	0.230 (0.341)
majority	5.973*** (2.208)	5.720*** (2.197)	5.441** (2.215)	5.336** (2.204)
senator	108.9*** (9.648)	105.3*** (9.254)	108.8*** (9.750)	74.30*** (12.29)
member		27.80*** (6.755)	28.62*** (6.695)	29.09*** (6.542)
coalition			0.330** (0.138)	0.338** (0.134)
population				20.22*** (4.363)
year fixed effects	Yes	Yes	Yes	Yes
constant	Yes	Yes	Yes	Yes
Observations	1,642	1,642	1,642	1,642

Robust standard errors in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

In the next step, we present the same set of determinants in Table 6, with respect to collaborative earmarks (e2) only, which is the earmark amount of collaborative earmarks that a MC requested with other MCs. When other important factors such as membership in Appropriation committees are added, most of the variables for Retiring, majority, senator, and all other determinants retain their significance. The only exception is seniority in the third and fourth columns.

The amount of earmarks requested is greatly reduced by the prospect of retirement as is the number of earmarks. We briefly present these results in Table 3.7. The top part of the table shows consistent results with the known factors influencing earmark amount, such as senator, Appropriations Committee membership. The lower part of the tables examines other potential determinants on the number of earmarks, and finds them mostly insignificant (except for chairmanship for $N2$ at the 10% level). The retirement effect holds for both $n2$ (the number of collaborative earmarks) and $N2$ (individual & collaborative earmarks).

3.2.3 Other potential factors

We now consider several other factors that could potentially influence a MC's earmarking activity.

In Table 3.10 and the following Table 3.11, we experiment with several other member and state charac-

Table 3.7: Determinants for the number of earmarks ($N2, n2$)

	(1)	(2)	(3)	(4)
	n2	n2	N2	N2
retiring	-7.854* (4.119)	-7.636* (4.110)	-10.77** (4.347)	-9.867** (4.361)
seniority	0.135 (0.151)	0.0329 (0.150)	0.498*** (0.158)	0.423** (0.172)
majority	3.255*** (1.004)	3.079*** (0.992)	3.811*** (1.070)	3.459*** (1.071)
senator	32.08*** (5.276)	33.13*** (5.218)	38.38*** (5.357)	38.40*** (5.512)
member	10.97*** (2.872)	9.484*** (2.955)	29.60*** (3.323)	26.11*** (3.927)
coalition	0.0953 (0.060)	0.0934 (0.061)	0.0693 (0.064)	0.0646 (0.063)
population	19.04*** (3.620)	19.27*** (3.604)	18.39*** (3.571)	18.48*** (3.578)
PVI	0.238*** (0.053)	0.231*** (0.056)	0.247*** (0.057)	0.224*** (0.061)
chair		4.153 (6.153)		13.09* (6.977)
swing		-0.242 (5.534)		-2.171 (5.997)
vulnerable		-5.766* (3.236)		-3.216 (3.736)
Hispanic		-2.651 (5.145)		-1.299 (4.951)
female		0.133 (2.813)		1.631 (2.887)
year fixed effects	Yes	Yes	Yes	Yes
constant	Yes	Yes	Yes	Yes
Observations	1,642	1,642	1,642	1,642

teristics for earmarking output. The factors considered all failed to be statistically significant. PVI, being from in a swing state, electoral vulnerability (won the last election with thin margin¹³), Hispanic, or female. The same applies to collaborative earmarks. In Table 3.11, seniority does not seem to have any influence on collaborative earmarks, which is consistent with the findings in Table 6.

3.3 Further discussion

3.3.1 Reduced efforts

Possible explanation for the reduction earmarks by retiring members could be the reduced legislative effort level by these members.

We use two measures to approximate the legislative effort level. Specifically, variables “sponsor” and “cosponsor” are the number of bills a member of Congress sponsored or co-sponsored each year. These are introduced in the estimation to capture the efforts level, since retiring congressmen could have become less motivated during their last year in the Congress and thus requested fewer earmarks. The measure “sponsor” is not ideal because little effort is required for congressmen can re-introduce bills each year, that were not passed in the previous Congress. Despite these limitations, we argue that bill sponsorship and co-sponsorship can serve as indicators for the effort level, without having a competing relationship with earmarking. The time and effort required for bill sponsorship is much greater than inserting an earmark in legislative spending. On the other hand, co-sponsoring a bill requires much less time and effort, cosponsorship merely requires signing one’s name on a bill originally sponsored by another MC. Bill co-sponsorship builds connections and allies within the Congress, and provides information for constituents. Bill co-sponsorship requires perhaps comparable time as earmarks, and will also be reduced if the MC is planning to retire.

In the empirical findings of Table 3.8, including bill sponsorship and co-sponsorship into the original model explains the earmarks for $E2$, $e2$, $N2$, $n2$, that higher bill sponsorship or co-sponsorship levels are associated with more earmarks. And in Table 3.8, combinations of bill sponsorship or co-sponsorship with respect to $E2$ retain effects of the determinants we have explored before, including retirement.

¹³The percentage of votes received in the latest election is transformed into the dummy variable “vulnerable” following Engstrom and Vanberg (2010), which takes value 1 if the congressman received less than 55% of the general vote. Vote percentage is endogenous and may not be an good measure for unobserved ability. These two conditions are also tested separately, and both retain insignificance.

Table 3.8: Controlling for general effort level: Bill sponsorship and co-sponsorship

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
retiring	E2 -22.12*** (8.028)	E2 -23.08*** (7.536)	e2 -13.60* (7.359)	e2 -14.01** (7.110)	N2 -8.263** (4.009)	N2 -9.945*** (4.261)	n2 -5.701 (3.806)	n2 -6.624* (4.013)
seniority	1.054** (0.421)	1.121*** (0.408)	0.174 (0.361)	0.261 (0.353)	0.460*** (0.159)	0.567*** (0.163)	0.108 (0.154)	0.203 (0.152)
majority	5.355** (2.320)	6.485*** (2.476)	3.977* (2.161)	5.384** (2.386)	3.676*** (1.129)	5.538*** (1.142)	3.141*** (1.071)	4.773*** (1.069)
senator	92.56*** (15.930)	96.91*** (14.960)	71.06*** (13.500)	77.07*** (12.660)	32.78*** (5.773)	39.65*** (5.451)	27.09*** (5.636)	33.44*** (5.278)
member	54.35*** (7.698)	53.14*** (8.007)	30.33*** (6.286)	28.96*** (6.490)	31.57*** (3.265)	29.64*** (3.305)	12.67*** (2.864)	11.07*** (2.857)
coalition	0.287** (0.144)	0.286** (0.143)	0.331** (0.138)	0.334** (0.137)	0.0842 (0.064)	0.0838 (0.065)	0.105* (0.061)	0.109* (0.060)
population	13.85*** (4.809)	15.70*** (5.009)	17.82*** (4.197)	20.09*** (4.378)	15.49*** (3.084)	18.48*** (3.557)	16.37*** (3.275)	19.10*** (3.584)
sponsor	0.503 (0.336)		0.624** (0.291)		0.807*** (0.178)		0.714*** (0.160)	
cosponsor		0.0193* (0.010)		0.0333*** (0.009)		0.0296*** (0.007)		0.0328*** (0.007)
year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
constant	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,569	1,569	1,569	1,569	1,569	1,569	1,569	1,569

Robust standard errors in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

3.3.2 Favor exchange

Favor exchange is one of the reasons often cited to criticize the use of earmarks. In a case study on military earmarks, Health (2008) identified 500 companies that received earmarks. Four fifth of these companies had employees or political action committees (PAC) that contributed to congressional reelection funds over a period of six years. The total contributions exceeded \$47 million, and these companies spent more than \$160 million to lobby for earmarks in 2006 alone. Congressional members may be obliged to return favors for these contributions for their election campaigns.

In order to investigate the favor exchange hypothesis, we employ a measure of the contributions that each congressman received during his or her latest campaign: “Receipts” (in thousand dollars). Despite the empirical evidence from previous studies (Stratmann (1991), Stratmann (2002)), in Table 3.9, “Receipts” appears to have minimal effects on earmarks in all four columns, for both the earmark amount and number. Note that the measure for contributions is an aggregate variable that does not distinguish between individual and corporate contributions, as shall be mentioned by the end of this paper as a limitation.

Table 3.9: Earmarks and campaign donations

	(1)	(2)	(3)	(4)
	E2	e2	N2	n2
retiring	-34.49*** (11.060)	-21.33** (10.200)	-15.84*** (5.460)	-10.27* (5.309)
seniority	1.066*** (0.405)	0.186 (0.354)	0.547*** (0.168)	0.188 (0.157)
majority	5.880** (2.497)	4.948** (2.405)	5.026*** (1.202)	4.299*** (1.135)
senator	98.06*** (16.580)	75.09*** (13.690)	35.12*** (6.179)	28.60*** (5.735)
member	54.38*** (8.124)	29.40*** (6.579)	30.61*** (3.522)	11.36*** (3.006)
coalition	0.270* (0.156)	0.326** (0.150)	0.0841 (0.072)	0.109 (0.069)
population	18.19*** (5.499)	23.82*** (5.007)	18.31*** (3.725)	19.60*** (4.059)
receipt	-0.00101 (0.001)	-0.00098 (0.001)	0.000579 (0.001)	0.000404 (0.001)
year fixed effects	Yes	Yes	Yes	Yes
constant	Yes	Yes	Yes	Yes
Observations	1,484	1,484	1,484	1,484

Robust standard errors in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

We do not have the complete data on sponsorship or political receipts data for the years considered in

this paper. There are 73 and 158 missing observations. Many of the missing observations are for MCs that are no longer in the Congress but for which their earmarks remained in the legislation. We re-estimate for earmark amount and number without these MCs. The results remained consistent.

3.4 Related Research

The allocation of limited resources is one of the eternal themes in economics and distributive politics. With respect to the factors influencing the allocation of earmarks, there are a variety of suggestions about the factors involved. Some have suggested partisan effects (e.g., Levitt and Snyder (1995), Alvarez and Saving (1997)); some have suggested for local demand (Alvarez and Saving (1997), Balla, Lawrence, Maltzman, and Sigelman (2002)), and some have argued for institutional positions such as party leader, membership and chairmanship of Appropriation Committees (Engstrom and Vanberg (2010), De Figueiredo and Silverman (2006)).

Intra-party allocation of distributive benefits are presented by Balla, Lawrence, Maltzman, and Sigelman (2002), find that membership in the majority party, membership on Appropriations Committees, seniority, party leadership, electorally vulnerability and ideology are important factors influencing earmarks. They argues that the majority party reserves the most valuable rewards for its members (Cox and McCubbins (1993)). Bickers and Stein (2000) find that during the 104th Congress, Republican control of Congress had not altered the politics of domestic spending, only the content of domestic public policy. Evans (1994) found evidence of coalition formation from the use of pork in the House.

Favor exchange is often suggested as an incentive for earmarks. Heath (2008) reports direct linkage between contributions and recurring payment from companies that later received military earmarks and members who sponsored the earmarks. De Figueiredo and Silverman (2006) focus on academic earmarks, and show large returns from lobbying when a university is represented by a HAC or SAC member,¹⁴ but minimal return otherwise. Welch (1982) shows the existence of reciprocity between legislators and contributors for milk price supports. Similarly, Stratmann (1991) find that campaign contributions is an important determinant for the voting behavior of legislators in 80% of the roll call votes. Later Stratmann (2002) also finds that changes in contributions affect the roll call voting behavior in financial service legislation.

¹⁴HAC: House Appropriations Committee. SAC: Senate Appropriations Committee.

Enhancing the prospect of reelection is also one of the driving forces behind earmarks. Weingast, Shepsle, and Johnsen (1981) show that the reelection mechanism attributes to the inefficiencies of pork projects. Earmarks are often used by Congressional members to enhance their chance of reelection. Among the 535 lawmakers that Heath (2008) searched, approximately half had boasted about the earmark spending brought to their districts. Thus, parties want to allocate earmarks to members that need them for reelection. Engstrom and Vanberg (2010) argue that party leaders have reasons to determine the distribution of earmarks among their members, balancing the individual and collective interests, and allocates earmarks to vulnerable members for securing a district. Balla, Lawrence, Maltzman, and Sigelman (2002) fail to find such evidence for electorally vulnerable (previous vote margin less than 55%) members, while Engstrom and Vanberg (2010) find that a senator with the seat up for election sponsors more earmarks.

Several other potential factors impacting the amount and number of earmarks are also experimented as shown by the end. None of them shows any significant effects on earmark number or amount.

One important caveat in the early research, as pointed out by Engstrom and Vanberg (2010), is that these studies rely on geographic locations of projects to identify their congressional patrons from as proposed to the actual sponsors. The fact that most earmarks are jointly requested by multiple members of the Congress and may extend across state and district borders makes the inference problematic. The reforms starting in 2007 that mandated disclosure of earmark sponsors¹⁵ now enable researchers to obtain accurate correspondence between earmarks and their sponsors, which leads to the investigations in this paper.

3.5 Summary

By utilizing recently disclosed data on each congressional member's earmarking record, supplemented by a rich set of congressman and district characteristics, we are able to perform a series of investigations on the potential determinants of legislative earmarks between 2008 and 2010. Seniority, majority party with the President, senators, members of the Appropriations Committees, larger size of coalition, and local demand are all shown to have a positive impact on the number and amount of earmarks. Impeding retirement has an negative effect on earmarks, and this effect remains after controlling for the general effort level. The reduced earmarks from retirement may reflect the reduced incentives for credit claiming, reelection or favor exchange.

¹⁵And even after the reforms, CAGW still discovered anonymous earmarks inserted in Appropriation bills.

Table 3.10: Potential factors impacting individual & collaborative earmarks (E2)

	(1)	(2)	(3)	(4)	(5)	(6)
retiring	-24.53*** (7.689)	-23.16*** (7.742)	-24.35*** (7.493)	-24.56*** (7.525)	-24.71*** (7.538)	-24.19*** (7.535)
seniority	1.104*** (0.399)	1.051** (0.414)	1.100*** (0.394)	1.077*** (0.377)	1.101*** (0.394)	1.122*** (0.394)
majority	6.170*** (2.233)	5.654** (2.200)	6.120*** (2.303)	6.167*** (2.268)	6.275*** (2.290)	6.042*** (2.261)
senator	95.84*** (14.43)	94.64*** (14.83)	95.79*** (14.62)	96.30*** (14.47)	95.41*** (14.64)	96.02*** (14.56)
member	53.30*** (8.023)	48.05*** (10.10)	53.27*** (8.028)	53.14*** (8.016)	53.33*** (8.020)	53.16*** (8.022)
coalition	0.290** (0.139)	0.280** (0.139)	0.291** (0.139)	0.291** (0.140)	0.292** (0.139)	0.292** (0.139)
pop	15.23*** (4.991)	15.26*** (4.989)	15.27*** (5.017)	15.27*** (5.017)	15.40*** (5.022)	15.12*** (4.987)
PVI	0.00696 (0.118)					
chair		21.83 (19.25)				
swing			-10.91 (11.49)			
vulnerable				-1.788 (5.457)		
Hispanic					-4.212 (6.158)	
female						3.450 (4.678)
year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
constant	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,642	1,642	1,642	1,642	1,642	1,642

Robust standard errors in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 3.11: Potential factors impacting collaborative earmarks (e2)

	(1)	(2)	(3)	(4)	(5)	(6)
retiring	-15.92** (7.265)	-16.19** (7.323)	-16.58** (7.103)	-16.65** (7.109)	-16.83** (7.131)	-16.57** (7.141)
seniority	0.208 (0.345)	0.21 (0.357)	0.227 (0.341)	0.14 (0.318)	0.226 (0.341)	0.236 (0.341)
majority	4.597** (2.153)	5.135** (2.095)	5.285** (2.217)	5.199** (2.184)	5.394** (2.206)	5.273** (2.165)
senator	75.03*** (12.140)	73.88*** (12.470)	74.30*** (12.290)	75.85*** (12.070)	73.95*** (12.300)	74.39*** (12.240)
member	29.14*** (6.563)	27.18*** (8.136)	29.07*** (6.542)	28.59*** (6.545)	29.12*** (6.536)	29.04*** (6.545)
coalition	0.331** (0.133)	0.334** (0.133)	0.338** (0.134)	0.337** (0.134)	0.339** (0.134)	0.338** (0.134)
population	20.07*** (4.334)	20.22*** (4.351)	20.23*** (4.364)	20.34*** (4.344)	20.36*** (4.355)	20.17*** (4.345)
PVI	0.136 (0.095)					
chair		7.949 (14.740)				
swing			-6.254 (10.110)			
vulnerable				-5.729 (4.997)		
Hispanic					-3.645 (5.619)	
female						1.308 (4.204)
year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
constant	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,642	1,642	1,642	1,642	1,642	1,642

Robust standard errors in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Several weaknesses of this paper are worth noting. First, the majority of earmarks are jointly requested by congressional members. This makes the division of individual share of those earmarks difficult to define. We use the total amount of earmarks without imposing any structural assumption on individual contributions. Second and similarly, the fact that many earmarks extend across states and last for multiple years makes the amount received for a certain district each year hard to measure with the current data.

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