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U.S. Government Institutions and the Economy

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by

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The Dissertation of Grant Erik Johnson is approved and is acceptable in quality and form for publication on microfilm and electronically:

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DEDICATION

To my parents, Kirk and Amy.

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ABSTRACT OF THE DISSERTATION

U.S. Government Institutions and the Economy

by

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These essays explore how institutional features of the U.S. government interact with the broader economy in response to economic shocks. Chapter 1 studies the channels by which powerful legislators can influence the spatial distribution of federal procurement spending. Chapter 2 examines the role that Tax and Expenditure Limitations play in municipal governments' response to economic fluctuations. Chapter 3 investigates the effects of electoral vulnerability on district level spending for majority party members of the U.S. House of Representatives in an effort to tease out the features of spending that are thought to provide the greatest electoral benefit.

Chapter 1

Procuring Pork: Contract Characteristics and Channels of Influence

1.1 Introduction

Researchers have studied Congressional influence over federal spending for decades. A large empirical literature shows that influence exists, in accordance with popular opinion.[1] Popular narratives often interpret this "pork-barrel" spending as corruption, but this interpretation and potential policy responses depend crucially on the channel of influence. The underlying channels of legislative influence have received relatively less attention in the literature, despite their importance. In this paper, we emphasize two distinct channels and empirically assess their relevance in the context of federal procurement spending, which in 2012 totaled approximately $800 billion—4% of GDP and 40% of all federal discretionary spending. The first is "selection influence," where legislators increase own-district spending by increasing funding of programs likely to spend in their districts. This influence is legal and intrinsic to a democratic system. It is very different from legislators influencing where a particular contract will be awarded, which we call relocation influence; this type of influence may be legal or illegal.[2]

Unique features of the procurement process make relocation influence relatively less likely in that domain, compared to other types of federal spending. Grants and loans, for example, are explicitly redistributive types of spending the federal government provides to local governments, individuals, and other public institutions. They often fund local public goods (quintessential "pork"), such as the transportation projects studied in Aidt and Shvets (2012), or take the form of direct transfers to individuals. From the perspective of the federal government, the spending associated with grants and loans *is* the public good. Reflecting the redistributive nature of grant and loan spending, Congress retains far more control over agencies' choice of recipients for spending in these categories.[3] In contrast, goods and services purchased through

[1] Extensive discussion of this literature is included at the end of the section.

[2] In work in progress, we are extending our analysis to include examining firm establishment (re)location, contract modifications, and marginal costs to proxy for underlying behavior.

[3] Personnel spending is another type of federal discretionary spending. In the case of personnel spending, regulations promote an open hiring process, for example by requiring agencies to post vacancies to a publicly accessible website. Furthermore, salaries are fixed within narrow bands according to a position's occupational designation and an individual's tenure and experience level. This constraint on personnel salaries limits rents, so that personnel spending is likely a less ideal target for politicized spending.

the federal procurement process are inputs into the production of public goods achieved through federal government operations (*e.g.*, national defense). Economic spillovers associated with procurement are incidental to the acquisition of productive inputs, rather than being the central purpose of the spending. Furthermore, procurement regulations intend to promote the economical acquisition of production inputs, with little regard to the spatial distribution of spending.[4]

We estimate the effects of gaining powerful congressional positions—in particular, House Appropriations subcommittee leadership positions[5]—on own-district procurement spending and despite the above, we find that subcommittee chairs exert substantial influence over procurement that is driven by relocation. To document aggregate influence, we create a novel dataset mapping the universe of unclassified federal procurement contracts signed between 2007 and 2016 to House Appropriations subcommittees and borrow the within-member, generalized difference-in-differences framework used in Berry and Fowler (2016), who measure congressional influence over federal non-procurement spending. We find that ascending to chair, on average, increases own-district federal procurement spending by 35.1% over a congressional term. As a placebo test, we show that there is no effect in the Congress before the representative ascended to chair. To show that the aggregate effect is driven by relocation influence, we develop novel methodology that exploits detailed contracting microdata in order to identify the types of contracts relatively more susceptible to either form of influence.

U.S. federal legislators do not directly control which firms receive federal procurement contracts. Rather, Congress funds federal programs and federal agencies in the executive branch manage program implementation. In particular, agencies retain exclusive responsibility for awarding procurement contracts through a regulated contract award process that limits

[4]There is evidence that these regulations are not always followed. Eckert (2006) describes one particularly egregious case of political influence over government contracts. Representative Randall "Duke" Cunningham served on the Defense Appropriations subcommittee from 1997 until his resignation in 2005, when he was found to have awarded government contracts in return for bribes and even had a personal "bribe menu." Additionally, Gordon (2011) documents misconduct by the General Services Administration's (GSA) Public Buildings Service during the Bush era. On whole, however, we expect regulations to reduce relocation influence over procurement relative to other types of spending.

[5]The political science literature identifies Appropriations subcommittees as especially influential, since members of these committees negotiate annual federal budgets. See Berry and Fowler (2016) and the references therein.

the opportunity for direct political influence. We propose that powerful legislators influence procurement spending either through exerting pressure over this contract award process or through their legislative prerogative over which programs to fund. In other words, legislative influence over procurement spending must come either via leverage over the location of contract performance for a fixed pool of contracts, or via choices over which programs to fund.

We develop a method to discern the channel of legislative influence over the location of procurement spending: do powerful legislators influence which vendors win contracts associated with a fixed pool of funded programs, or do they selectively fund programs based on the anticipated location of subsequent contract performance? Our diagnostic relies on a fundamental difference in how these channels operate. In the first case, which we call type S, or "selection" influence, legislators cannot control where a *given contract* occurs, so instead control *whether* that contract exists by basing program funding decisions on the likely performance location of associated contracts. In the conduct of selection influence, the more precisely legislators can predict contract performance location, the greater the scope for political influence. In the second case, which we call type R, or "relocation" influence, a contract for a particular good or service *will* be awarded, and the question is *where* the contract will land. In the conduct of relocation influence, the greater the number of locations in which the contract can be performed, the greater the scope for political influence.

To make the distinction between these two types of congressional influence more concrete, consider two federal programs: the Navy Virginia-class Submarine program and the Army Operations and Maintenance program. There are only two vendors in the United States capable of building a nuclear-powered Virginia-class submarine—General Dynamics Electric Boat in Groton, Connecticut and Newport News Shipbuilding in Newport News, Virginia. If powerful legislators increase the budget for purchasing Virginia-class submarines in order to increase spending in Groton or Newport News, this is selection influence. In contrast, to meet Operations and Maintenance program goals, the Army purchases a variety of commercial products, such as office supplies and uniforms, that could potentially be sold by vendors across a variety of

locations. If powerful legislators influence the Army's choice of vendors for office supplies and uniforms, this is likely to be relocation influence.

We want our approach to classify the Army's contracts for office supplies and uniforms as type R contracts, and the Navy's contracts for nuclear-powered submarines as type S contracts. An observable difference between type R and type S contracts is the size of the pool of legislative districts in which a given contract could potentially be performed: type R contracts could be performed in many districts, while type S contracts could be performed in few districts. We exploit this fact to index each federal contract according to the predicted size of the pool of districts that could potentially perform the contract, as measured by a Herfindahl index, where here the index is used to measure contract concentration. Type R contracts occupy the low-concentration end of the index and type S contracts occupy the high-concentration end. We then test whether the effect of powerful legislators on procurement spending is driven by type R or type S contracts. Our evidence suggests that political influence occurs predominantly through relocation: becoming the chair of a House Appropriations subcommittee induces a 42% increase in own-district, type R contract spending over a Congress. These contracts comprise 81.5% of all procurement spending in our sample and hence account for virtually the entire aggregate effect. We find no detectable influence over type S contracts. Further results suggest that these effects are dominated by spending that is not under the subcommittee's jurisdiction, which might reflect inter-committee bargaining.

The literature on distributive politics is vast and contains many papers examining the effects of congressional committee membership on other types of discretionary federal government spending (*e.g.*, grants, transfers, loans and personnel). A number of papers attempt to document political influence over such spending, though often these papers do so by comparing congressional members on and off various committees and as such do not control for differences in constituency demand or legislator-specific effects.[6] Studies exploiting within-constituency

[6]See, for example, Evans (1994), Balla et al. (2002), Lee (2003), Evans (2004), Crespin and Finocchiaro (2008), Lazarus (2009), Lazarus and Steigerwalt (2009), and Lazarus (2010).

variation in committee membership to control for selection have reached mixed conclusions. Payne (2003), Knight (2005), and Cohen, Coval and Malloy (2011) all find positive effects of committee membership on federal non-procurement spending, while Berry, Burden and Howell (2010) find no such effects. The only study we are aware of that employs a within-member design to examine the effects of committee membership and position on outlays is Berry and Fowler (2016), who find largely no effects of committee membership on spending except for Appropriations subcommittee leaders, who are found to exert substantial influence over the non-procurement spending specifically under their jurisdiction.

However, comprehensive evidence on procurement spending is lacking.[7] Berry and Fowler (2016) provide subsidiary results showing by and large no effect of broader Senate committee membership on state level procurement spending, but no attention is paid to Appropriations subcommittees or their leadership, in particular. Cohen, Coval and Malloy (2011) do find a significant impact of becoming the Senate Finance committee chair on subsequent own-state procurement contract spending. The discrepancy between these two papers is likely attributable to differences in the variation being used to produce these estimates. Our primary contribution to the distributive politics literature is parsing out the mechanisms by which legislative influence occurs, and we are the first to explore the types of contracts relatively more subject to political influence. Additionally, we estimate the effects of becoming a House Appropriations subcommittee leader on the spatial distribution of total procurement spending and show these effects primarily come from spending unrelated to the subcommittee.

We also contribute to the literature on the effects of politics on procurement outcomes. In other countries, studies have shown that politics can lead to inefficient procurement outcomes,[8]

[7] The literature specifically pertaining to procurement has traditionally focused on military spending in particular, largely due to data constraints. A number of studies conclude that state representation on defense committees induces larger increases in military procurement in those states than in states with no such representation. These studies include Rundquist, Lee and Rhee (1996), Carsey, Rundquist and Fox (1997) and Carsey and Rundquist (1999*b*) The primary goal of these studies has been to distinguish between competing models of congressional policymaking; these papers find evidence in favor of the committee-centered distributive model. Carsey and Rundquist (1999*a*) ask a similar question, but instead find evidence supporting a party-centered distributive model.

[8] See, for example, Hyytinen, Lundberg and Toivanen (2011) and Coviello and Gagliarducci (2017).

though the acquisition regulations and bid-protest mechanisms in place presumably mitigate such concerns in the United States.[9] Such measures are intended to make government contracting "rule-based," and Boone, Dube and Kaplan (2014) show that formulaic assignment of American Recovery and Reinvestment Act (ARRA) non-procurement funds lessens the scope for political influence. Finally, there is a sizable finance literature examining the interaction between political connections and firm performance.[10] Our results show that ascending to chair of a House Appropriations subcommittee induces a significant increase in own-district procurement contract spending and hence can be viewed as complementary to many of these studies.

The rest of the paper proceeds as follows. Section 1.2 provides the requisite background information on the federal appropriations and procurement processes. Section 1.3 describes the contract concentration index we design. Section 1.4 discusses the data used in this project and provides various descriptive statistics; section 1.5 outlines our empirical approach. Section 1.6 presents our results and section 1.7 concludes.

1.2 Background

A key contribution of this paper is disentangling whether representatives influence the spatial distribution of federal procurement spending through their control over legislation establishing federal budgets, or by exerting pressure on agencies' contract award processes. In this section, we present institutional knowledge to facilitate understanding of how these two channels would operate.

[9] See Maser, Subbotin and Thompson (2012) for an examination of bid-protest mechanisms in the U.S.

[10] Such papers include Akey (2015), Brogaard, Denes and Duchin (2016), Cohen and Malloy (2016), Do, Lee and Nguyen (2015), Goldman, Rocholl and So (2013), Gropper, Jahera Jr. and Park (2013) and Tahoun (2014).

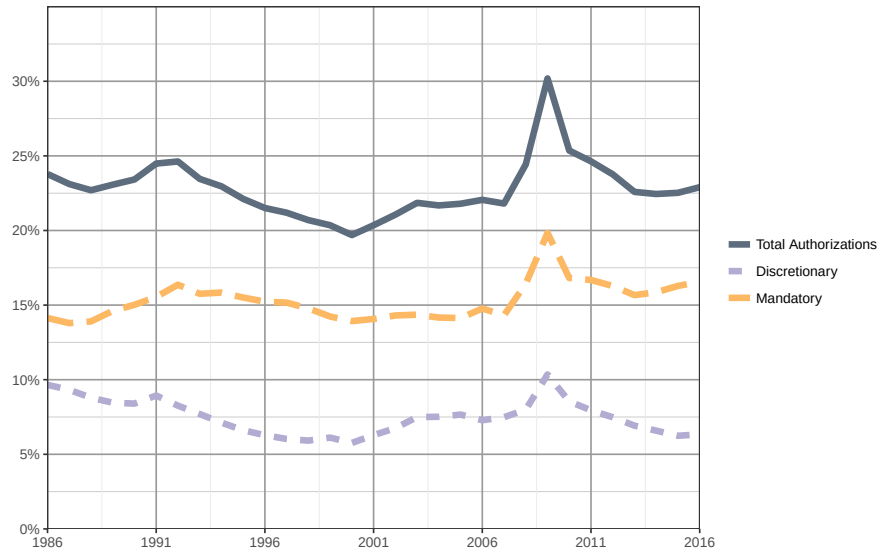


Figure 1.1: Federal Government Authorizations (%GDP)

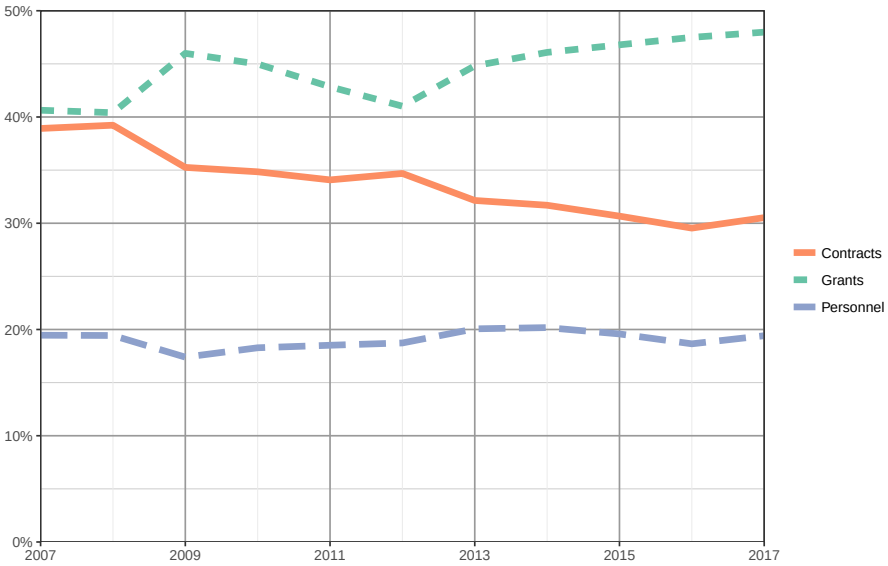


Figure 1.2: Decomposition of Discretionary Outlays by Spending Vehicle

Congress must approve all federal spending, per the U.S. Constitution. Federal spending falls into two distinct categories—mandatory and discretionary spending—according to the process by which congressional approval occurs. For discretionary programs, which involve procurement, grant, and personnel expenditures, congressional approval occurs through a two-

step process.[11] This two-step process requires Congress to pass initial legislation authorizing the execution of discretionary programs, and subsequent annual legislation funding them. This legislative process funds all federal procurement contracts, and thus constitutes Congress's most straightforward means of influencing procurement spending.

Figure 1.1 provides data on the time paths of federal mandatory and discretionary spending. Of note is that discretionary spending constitutes a significant portion of the U.S. economy, peaking at just over 10% of GDP in fiscal year 2009. Figure 1.2 breaks down discretionary spending into its three primary categories—contracts, grants and personnel—and highlights the relative importance of procurement (contracts) in overall discretionary spending. Finally, figure 1.3 presents detailed information on the subcategories of mandatory and discretionary spending and their respective sizes.

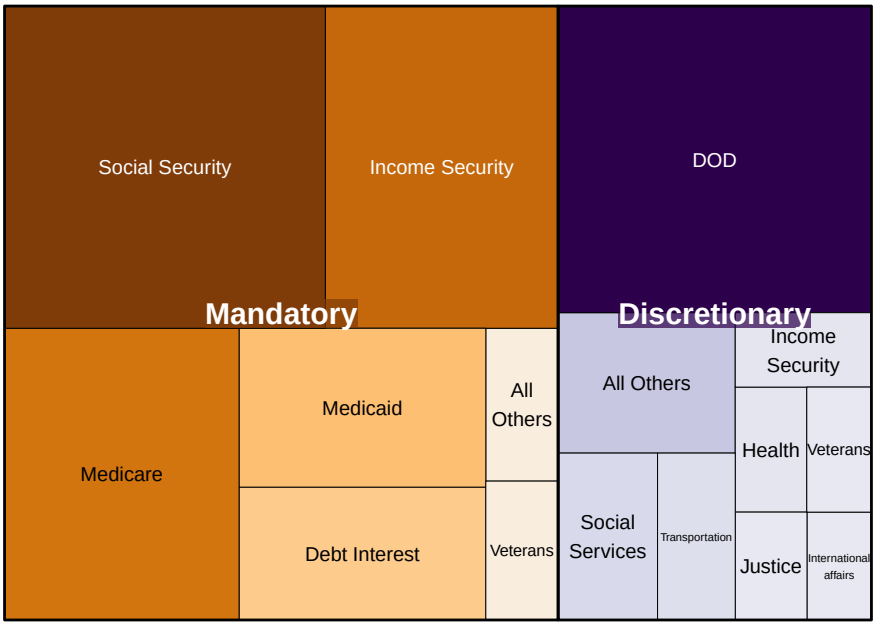


Figure 1.3: Composition of U.S. Federal Budget (2011)

The legislative process and sources of legislative power. Legislation originates in the

[11] For mandatory programs, spending is approved in the same legislation that creates the program, and Congress must change program legislation in order to change spending levels associated with the program. Most mandatory programs are transfers from the federal government to individuals—for example, social security. Annual spending levels are only indirectly controlled by Congress, since the government is obligated to fund benefits for all eligible recipients. Mandatory programs constitute approximately 55% of the total federal budget.

House, and becomes law if the House and Senate both approve the legislation by majority vote, and if the President signs it. All proposed legislation is assigned to House and Senate committees for study, debate, and amendment prior to chamber-wide voting on the legislation. As discussed extensively in the political science literature on U.S. federalism, heterogeneity across legislators in political power derives in part from committee positions. Some committees are considered to be more powerful than others based on the importance of the legislative matters under their jurisdiction. Within committees, the committee chair and ranking minority party member hold additional power due to their control over committee agendas and processes. Committee membership and leadership are determined within each of the two major parties, based primarily on seniority within each party and seniority on each committee. Committee membership and leadership generally change after congressional elections, particularly when the parties change majority/minority status.

Authorizations and Appropriations. Congressional approval of U.S. discretionary programs is a two-step process. First, Congress passes legislation creating (authorizing) a program. Many types of federal legislation can authorize programs, and authorizing legislation can emanate from a variety of congressional committees. Second, Congress passes appropriations legislation budgeting specific funding levels for authorized programs. Unlike program authorizations which can be scattered throughout different types of bills, only specific appropriations legislation can fund programs. Furthermore, while program authorization need not occur annually, discretionary program funding does occur through annual appropriations legislation. In addition to annual appropriations legislation, Congress might pass supplemental appropriation bills funding, for example, responses to unanticipated emergencies.

In contrast to authorizing bills, annual appropriations legislation conforms to a standardized structure. Federal government operations are partitioned across twelve separate appropriations bills, allowing separate negotiation and passage of budgets for different parts of the federal government. The House and Senate each have an Appropriations committee responsible for appropriations legislation, and these committees are divided into 12 subcommittees matching the

appropriations bills. See appendix A.1.2 for Appropriations subcommittee jurisdictions across federal programs.

The federal procurement process. Federal agencies manage procurements funded from their budgets according to a uniform federal procurement process specified by the Federal Acquisition Regulation (FAR). The FAR aims to ensure the purchase of goods and services for the "best value to the government," and to this end, requires agencies to use procedures that promote competition and transparency. The FAR requires agencies to seek competitive vendor bids. Exceptions to these competition requirements must be justified and approved through a specific procedure. Agencies must announce unclassified procurements exceeding $25,000 to a centralized, publicly accessible webpage. In the case of non-competed contracts, announcements identify recipient vendors. Bid solicitation documentation must clearly describe contract performance requirements and bid evaluation considerations. Communication between government procurement officials and bidders are tightly regulated to ensure no vendor is advantaged with additional information. Losing bidders can request justification for their non-selection, and can appeal ("protest") the award decision to an agency-independent federal arbitrator. The federal government maintains a record-keeping and audit infrastructure to ensure agency compliance with federal procurement procedures; government personnel signing contracts can be held criminally and financially liable for deviations from procurement regulations. Regulation, therefore, limits the scope for direct political influence over procurement spending.

1.3 Contract Concentration Index

Appropriations legislation specifies funding levels for each discretionary federal program, and these program appropriations line-items vary in the discretion they allow agencies to determine how to spend program funding. We exploit this variation to disentangle the mechanisms of legislative influence over procurement spending location. For example, the 2014 Army Operations and Maintenance program appropriations line-item, shown in figure A.1 in appendix

A.2, provides a $31 billion budget which the Army can spend on any expenses supporting 2014 Army Operations and Maintenance, as defined by the associated authorizing legislation. On the other hand, the 2014 Navy Shipbuilding and Conversion program appropriations line-item, shown in figure A.2 in appendix A.2, budgets $3.1 billion specifically for the acquisition of Virginia-class submarines, leaving agencies virtually no discretion over the expenditure of these funds. Finally, the 2014 National Parks Service appropriations line-item, shown in figure A.3 in appendix A.2, provides the agency an intermediate level of discretion, budgeting $2.2 billion for general expenses, $1 billion of which must be spend on Everglades restoration. In general, large research and development, systems procurement, and construction programs are funded by specific line-items leaving agencies little discretion, while personnel and operating funds are provided through less restrictive line-items.

We design a contract concentration index to infer the specificity of appropriations legislation associated with each federal contract in order to empirically answer the question: do powerful legislators influence which vendors win contracts associated with a fixed pool of funded programs (relocation influence), or do they selectively fund programs based on the anticipated location of subsequent contract performance (selection influence)? To exert relocation influence, the greater the number of locations in which a given contract can be performed, the greater the scope for political influence. To exert selection influence, the more precisely legislators can predict contract performance location, the greater the scope for political influence. Consequently, the size of the pool of legislative districts that could potentially perform a given contract provides a measure of contract susceptibility to relocation and selection influence.

We partition the sample of federal contracts into cells based on contract characteristics representing program-level features that would have been knowable to Congress during the appropriations process, and that explain variation in the the size of the pool of districts that could potentially perform the contract. The contract characteristics we incorporate are: (1) whether the contract is for a commercial item; (2) whether the contract is competed or sole-sourced, and if sole-sourced, the justification for sole-sourcing; (3) The anticipated contract value, split into three

bins: between \$0 and \$500,000, between \$500,000 and \$5,000,000, and above \$5,000,000;[12] and (4) the type of appropriations legislation funding contracts: regular annual, supplemental for war, and supplemental for emergency response. The interaction of these categories generates 144 cells. We then calculate the Herfindahl index value—a widely-used measure of market concentration—for each cell,[13] so that cells with low concentration values are more likely to contain type R contracts, and cells with high concentration values are more likely to contain type S contracts.[14]

Formally, the Herfindahl index value is calculated according to the formula

$$H_i = \sum_{j=1}^{435} s_{i,j}^2, \tag{1.1}$$

where i indexes contract cells, j indexes congressional districts and $s_{i,j}$ denotes district j's share of contract cell i spending. The Herfindahl index value is bounded between zero and one, and is proportional to the average share of cell spending across districts: higher average shares—and subsequently, higher index values—indicate greater concentration. See appendix A.1.4 for a description of each cell, the number of contracts in each cell, and the Herfindahl index value for each cell. Finally, we treat contracts for construction, real estate, and utilities separately, because these contracts typically derive from line-item appropriations, and location of contract performance is identified in the funding appropriations legislation. In other words, these are quintessential type S contracts; we treat these contracts as a 145$^{\text{th}}$ cell, which we manually assign the highest value of our concentration index.

[12] Value bin endpoints are approximate dollar thresholds across which procurement regulations relevant to contract awards vary.

[13] We drop cells containing fewer than 10 contracts.

[14] This methodology complements an alternative approach we are developing, which interprets the timing of stock-price movements for government contractors as an indication of whether news about appropriations legislation or contract award announcements carry more information regarding the identity of eventual contract recipients. The two indexes distinguish between the same two potential mechanisms of political influence over procurement spending, and thus should provide similar results for contracts falling within both samples. A benefit of the Herfindahl index approach presented in this paper is that it covers a wider variety of contracts than the stock-based approach.

By several measures, our contract concentration index achieves its intended goals. First, our cell partitioning provides a reasonably dispersed distribution over Herfindahl index values. Figure 1.4 shows the distribution of cells by Herfindahl index values, with the red dashed line indicating the median index value. While the distribution skews left, there is support up to a maximum value of 0.38. Second, correlations between cells' index values and contract characteristics accord with our economic intuition. Concentration is lower for competed contracts than it is for contracts awarded under restricted competition, lower for commercial items than customized items, and lower for low-valued contracts. Concentration is higher for contracts funded by supplemental war or emergency relief appropriations legislation than it is for contracts funded by regular annual appropriations. These results suggest that contract features knowable prior to contract award predict the size of the pool of districts that could potentially perform a contract—a prerequisite for selection influence—and that we have assigned contracts to cells based on useful contract characteristics. See appendix A.1.3 for contract concentration index summary statistics and index value correlations with various contract characteristics.

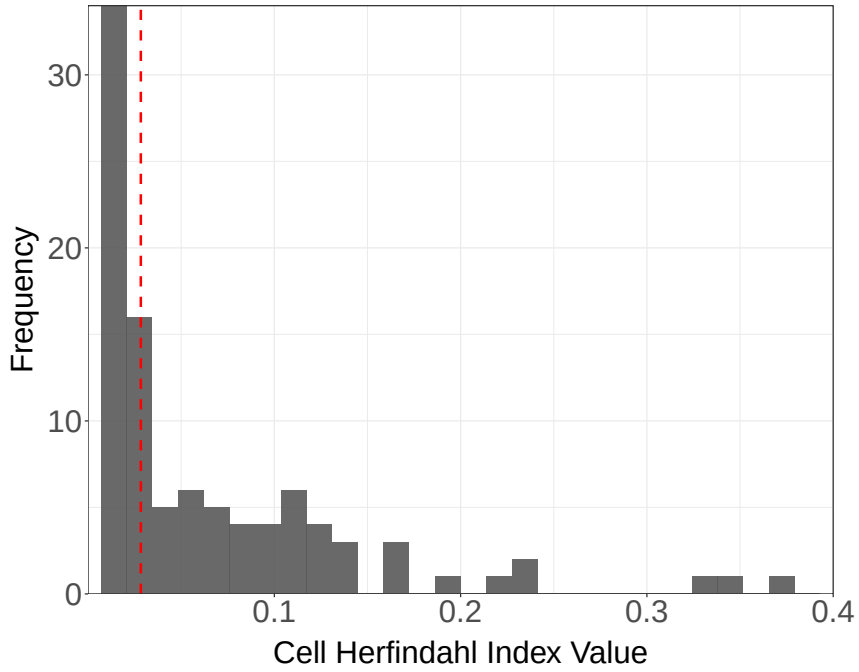


Figure 1.4: Distribution and Median of Cell Concentration

1.4 Data and Descriptive Statistics

Our political data span the years 2007-2016, matching the availability of the procurement data described below. We obtain House membership and representative demographic data from Charles Stewart's Congressional Data Page and Keith Poole's Interuniversity Consortium for Political and Social Research (ICPSR) webpage. We hand code membership on House Appropriations subcommittees and identify subcommittee chairs and ranking minority party members—the most powerful positions within a subcommittee—using official government data sources, namely the Standing Committees of the House report published with each Congress's Congressional Directory. We restrict attention to the "Commerce, Justice, Science, and Related Agencies" (Commerce), "Defense," "Financial Services and General Government" (Financial), "Homeland Security" (Homeland), "Labor, Health and Human Services, Education and Related Agencies" (Labor) and "Military Construction, Veterans Affairs and Related Agencies" (MilCon) subcommittees, as these are the subcommittees for which procurement spending constitutes a significant share of subcommittee-related spending.

U.S. federal contract data comes via the U.S. government's public-access spending database USASpending.gov. USASpending.gov contains the universe of approximately 46 million unclassified federal contract actions over $3,000 signed since 2007. We map contracts to the congressional district the vendor reports as the location of predominant contract performance. We also use contract data fields in the construction of our contract concentration index, discussed above. A novel contribution of this paper is our mapping of every posted contract action issued since 2007 to the Appropriations subcommittee responsible for negotiating that contract's funding legislation. We accomplish this by matching contract agency and sub-agency identifiers to Appropriations subcommittee jurisdictions based on label similarity. See appendix A.1 for more details.

We undertake our analysis at the Congress level and hence our data cover the 110^{th}-114^{th} Congresses. We move from annual to Congress level data for two reasons. First, doing so

better aligns our data with the timing of changes in leadership, which typically occur following congressional elections. This reduces measurement error in our key independent variables. Second, this allows us to more accurately capture political influence over spending, which may not appear in the year immediately following an election due to the nature of the appropriations and procurement processes described above. We sum contract spending within each two-year Congress in order to collapse to the Congress level; procurement spending summary statistics are presented in table 1.1.

Table 1.1: Procurement Spending Summary Statistics

Subcommittee	**Full Sample**		**Below Median**		**Above Median**	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Commerce	14.43	46.84	12.05	42.24	2.38	9.20
Defense	275.55	502.89	248.03	473.79	27.34	63.79
Financial	18.86	74.78	13.76	66.51	5.10	19.12
Homeland	12.30	59.31	10.35	55.80	1.90	7.21
Labor	16.29	81.02	14.50	68.40	1.74	17.38
MilCon	54.79	220.44	27.41	116.60	27.38	185.96
Total	428.01	726.70	348.97	627.09	78.73	222.21
N	2419	2419	2419	2419	2419	2419

Notes: Averages are computed across two-year Congresses and congressional districts. All values are real, per-capita spending. We deflate spending at the fiscal year level using the CPIU. The value of the CPIU on October 1, year t is used to deflate fiscal year t spending variables.

The "below median" and "above median" columns in this table stem from calculations for contract types below and above the median value of concentration, respectively. We construct these variables as follows. First, we rank contract cells by their Herfindahl index value, where higher numbers correspond to more concentrated contract types and lower numbers align with more widely distributed contract types. We then split contract cells at the median index value, and construct separate procurement spending variables for contracts belonging to cells that fall below and above this median value.

1.5 Empirical Framework

In our primary specification, we estimate the effects of attaining powerful House Appropriations subcommittee positions on total own-district procurement spending and above/below median concentration spending over a two-year congressional term. Our baseline specification is similar to that in Berry and Fowler (2016) and is given by

$$Procurement_{i,t} = \alpha + \beta_1 \times 1\{Ranking\}_{i,t} + \beta_2 \times 1\{Chair\}_{i,t} + \gamma_i + \delta_t + maj_{i,t} + sen_{i,t} + \varepsilon_{i,t}, \tag{1.2}$$

where $Procurement_{i,t}$ is the log of either total procurement spending or above/below median spending per-capita in representative i's district during Congress t. The $1\{Ranking\}_{i,t}$ variable takes a value of one if representative i is the ranking minority member of any House Appropriations subcommittee during Congress t and zero otherwise. Similarly, the $1\{Chair\}_{i,t}$ variable equals one if representative i is the chair of any House Appropriations subcommittee during Congress t and zero otherwise; γ_i and δ_t are representative and Congress (time) fixed effects, respectively.[15] The variable $maj_{i,t}$ controls for majority party status, while $sen_{i,t}$ controls for the effects of seniority on contract spending in a district. *Ex-ante* these are important controls to include, particularly because changes in these variables often happen concurrently with changes in subcommittee leadership, though our results are quite similar with or without these controls.[16] Standard errors are clustered at the state level to account for correlation across districts within a state. β_1 and β_2, when multiplied by 100, represent the average percentage increase in total or above/below median own-district, per-capita procurement spending over a congressional term caused by becoming the ranking minority member or chair of a House appropriations subcommittee, respectively.[17]

[15] The representative fixed effects variable, γ_i, is reset if the land mass of a representative's district changes by more than 30% from one Congress to the next, *e.g.*, following the 2010 Census.

[16] The results in Albouy (2013), in particular, motivate controlling for being a member of the majority party.

[17] This approximation breaks down for coefficient estimates above 0.10 in magnitude; the precise percentage increase is calculated as $100 \times \left(e^{\beta_k} - 1\right)$ for $k \in \{1,2\}$.

This is a fairly straightforward generalized difference-in-differences specification. Estimating (1.2) amounts to comparing changes in procurement spending in the districts of representatives who switch subcommittee positions over time to changes in spending for those who do not change position.[18] Since we are employing a difference-in-differences approach, we require a parallel trends assumption. Here, that assumption is that representatives who change committee positions would have followed the same time pattern in procurement spending as those who did not change positions, had they not changed positions themselves. Our identification depends crucially on this assumption. We would not have grounds to interpret our estimates as representing a causal relationship if, for instance, changes in subcommittee position were correlated with changes in procurement spending independent of the effect of gaining or losing that position. To continue with one of our earlier examples, this assumption would be violated if a Virginia representative became the chair of the Defense subcommittee due to her expertise on nuclear submarines and the increasing importance of these submarines. However, changes in subcommittee position typically arise for reasons outside the direct control of individual representatives. This is particularly true for ranking minority members and chairs of Appropriations subcommittees, who often acquire these positions based on within-subcommittee seniority as the House majority party changes or those currently in power leave for various external reasons. Further discussion of and statistical evidence on our identification is included in the following section, where we show that there is no placebo effect on spending the Congress before becoming chair.[19]

Finally, we modify the baseline empirical model to examine whether subcommittee leaders primarily exert influence over spending that is explicitly under their jurisdiction, or on other spending. In doing so, we redefine the dependent variable so that it equals either own-district, *subcommittee-specific* procurement spending or all other procurement spending,

[18]This avoids the pitfalls of simply comparing legislators on and off various (sub)committees; see Berry and Fowler (2016) for further discussion.

[19]See Berry and Fowler (2016) and Cohen, Coval and Malloy (2011) for additional discussion of the validity of this assumption.

and redefine the $1\{Ranking\}_{it}$ and $1\{Chair\}_{it}$ variables so that they equal one if representative i holds either of those positions on a particular subcommittee during a given Congress. This part of the analysis is thus undertaken at the representative-subcommittee-Congress level. Pooled results for these specifications use subcommittee-Congress and representative-subcommittee fixed effects in place of representative and Congress fixed effects to allow for different time trends and variable representative effects across subcommittees.

1.6 Results

1.6.1 Identification

We begin this section with a qualitative description of how power typically changes hands in House committees and subcommittees in order to justify the interpretation of our results as causal estimates. Following this discussion, we present the results of a formal specification test documenting the validity of these arguments.

House committee and subcommittee leadership is organized according to representative party and seniority. The representative from each of the two major political parties with the longest periods of service on that (sub)committee are the leaders of that (sub)committee, as long as they do not occupy another leadership position. The leader from the majority party is the (sub)committee chair, and the leader from the minority party is the ranking minority member. Representatives cannot hold multiple (sub)committee leadership positions. If the most senior member of a (sub)committee holds a leadership position on another (sub)committee, then either that representative must resign from the other leadership position, or leadership of the (sub)committee in question falls to the next most senior member who does not hold another leadership position.

Once we include representative fixed effects and control for majority and seniority, our identification strategy requires that any correlation between the timing of leadership changes and

subsequent contract spending in the affected representative's district is driven by differences in the representative's ability to extract rent due to his or her change in leadership status. In our sample, representatives ascend to leadership positions because an election changes the majority party so that chairs and ranking members trade places, or because the incumbent co-partisan (sub)committee leader vacates the position. Such vacancies occur because the leader is no longer a member of the House due to retirement, death, resignation to run for other political offices, or transitions to higher levels of party leadership (party whip, House Speaker, or House minority leader). In some instances, (sub)committee leaders vacate all of their (sub)committee positions due to scandals. Table 1.2 presents information on changes in leadership across the Congresses in our sample.

A typical series of leadership changes is illustrated by the case of the retirement of Norm Dicks, the Democratic leader of the Defense Appropriations subcommittee, at the end of the 112th Congress. Democrats were the minority party in the 112th Congress and hence Norm Dicks was the ranking minority member of the subcommittee at the time of his retirement. Pete Visclosky, the next most senior Democrat on the subcommittee, took over as Democratic subcommittee leader at the start of the 113th Congress. Democrats failed to take the majority in the 113th Congress, so Pete Visclosky assumed the position of Defense Appropriations ranking member. Had Democrats taken the majority, he would have become chair. Prior to Dicks's retirement, Visclosky was the ranking Democratic member of the Energy Appropriations subcommittee. In order to accept leadership on the Defense subcommittee in the 113th Congress, he had to resign from his leadership position on Energy. Two of the three other Democrats on the Energy Appropriations subcommittee already served in leadership positions on other subcommittees which they did not vacate, and the third Democratic member retired at the end of the 112th Congress. Democratic leadership of the Energy Appropriations subcommittee thus fell to the most senior Democrat who did not already have a leadership position: Marcy Kapture. Since members can only hold one leadership position, the retirement or death of a single legislator typically triggers several changes in leadership, as members relinquish one leadership position to

assume a more desirable one that becomes available.

A representative's eventual selection into a leadership position is not exogenous. Our empirical approach accounts for systematic differences in levels of contract spending across districts, such as if high levels of own-district spending increase the probability of becoming a subcommittee leader. However, if district-specific *trends* in spending are correlated with the likelihood of becoming a leader, this would violate our identification strategy. In order to allay such concerns, below we present the results of a placebo test showing that there is no effect on spending in the Congress before a representative ascended to chair.

Table 1.2: Changes in Leadership by Congress

ΔPower	**110-111**	**111-112**	**112-113**	**113-114**
Increase				
Neither → Chair	1	3	4	3
Neither → Ranking	3	3	1	2
Ranking → Chair	0	3	0	0
Decrease				
Chair → Neither	1	0	1	1
Ranking → Neither	1	1	0	2
Chair → Ranking	0	3	0	0
Totals	6	13	6	8

Notes: Democrats controlled the House during the 110th and 111th Congresses, after which the Republican party has held the majority. "Neither" signifies that a representative was neither chair nor ranking minority member of a House Appropriations subcommittee.

To construct the aforementioned placebo test, we augment our baseline specification to include leads of the subcommittee leadership variables.[20] The resulting estimating equation is

[20]We incorporate 2017 political data—for which we have no accompanying procurement data—into this specification in order to improve statistical power.

given by

$$\begin{aligned} Procurement_{i,t} =& \alpha + \beta_1 \times 1\{Ranking\}_{i,t} + \beta_2 \times 1\{Chair\}_{i,t} + \beta_3 \times 1\{Ranking\}_{i,t+1} \\ &+ \beta_4 \times 1\{Chair\}_{i,t+1} + \gamma_i + \delta_t + maj_{i,t} + sen_{i,t} + \varepsilon_{i,t}, \end{aligned} \tag{1.3}$$

where $1\{Ranking\}_{i,t+1}$ and $1\{Chair\}_{i,t+1}$ take a value of one if representative i becomes the ranking minority member or chair of any Appropriations subcommittee during the next Congress, respectively, and zero otherwise. Table 1.3 presents the results of this test for pre-treatment effects. The results support our claim that the evidence we provide on the effects of becoming a subcommittee chair on own-district procurement spending represents a causal relationship. While the coefficient on the variable $Chair_t$ is somewhat less precisely estimated, the point estimate is virtually identical to that reported in the next section in table 1.4 and, importantly, the coefficient on its lead is virtually zero. This rules out the concern that pre-treatment movement may be driving our results, in accordance with the arguments given above.

Table 1.3: Placebo Test Results

Variable	$Ranking_t$	$Ranking_{t+1}$	$Chair_t$	$Chair_{t+1}$
Coefficient Estimate	0.003	0.097	0.321*	-0.042
	(0.115)	(0.126)	(0.189)	(0.226)
N	1758	1758	1758	1758
Adj. R^2	0.878	0.878	0.878	0.878

Notes: Results from estimating (1.3). Clustered standard errors in parentheses. * indicates a coefficient statistically different from zero at the 0.10 level.

1.6.2 Baseline

Here we present results from estimating (1.2) on our full sample of contracts, as well as separately for contract types above and below the median concentration index value.[21] Coefficient estimates and standard errors for the subcommittee leadership variables across these three regressions are given in table 1.4. We find strong evidence that becoming the chair of a House Appropriations subcommittee leads to an increase in total own-district procurement spending; we find no such effect for becoming the ranking minority member of a subcommittee. The coefficient of 0.301 on *Chair* for the full sample implies that becoming the chair of a House Appropriations subcommittee generates, on average, a 35.1% increase in own-district procurement spending over the course of a congressional term, relative to the counterfactual of that same individual not having become a chair.[22] This result is statistically significant at the 5% level.

Table 1.4: Aggregate Procurement Results

Variable	**Full Sample**	**Below Median**	**Above Median**
Ranking	0.070	0.122	-0.016
	(0.103)	(0.122)	(0.201)
Chair	0.301**	0.351**	0.242
	(0.137)	(0.159)	(0.228)
N	2419	2419	2419
Adj. R^2	0.867	0.865	0.797

Notes: Clustered standard errors in parentheses. ** indicates coefficients statistically different from zero at the 0.05 level.

The substantially greater magnitude and statistical significance of the coefficient on *Chair* for the sub-sample of below median concentration contracts, relative to those above the median,

[21] Results are virtually identical if we instead divide contract types into terciles and examine the top and bottom terciles in isolation.

[22] This value is calculated as $100 \times \left(e^{\beta_2} - 1\right)$, since the log approximation breaks down for coefficient estimates above 0.10 in magnitude.

suggests that the overall effect is being driven by widely dispersed contracts, as opposed to geographically concentrated projects. Our results indicate that gaining chairpersonship produces a 42.05% increase in below median concentration procurement contract spending over a Congress. On average, these contracts comprise 81.5% of the total value of procurement spending in a district and hence account for nearly the entire aggregate effect. Due to the imprecise nature of the above median estimates, however, the coefficient estimates on *Chair* above and below the median are not statistically different from each other.

1.6.3 Own-Jursidiction vs. Other Procurement Spending

Table 1.5 displays results obtained from estimating a variant of (1.2), where here the dependent variable is either subcommittee-specific procurement spending or all other procurement spending, as opposed to total procurement spending.[23] Correspondingly, subcommittee leadership variables equal one if a given representative has that leadership position on that particular subcommittee and zero otherwise. Thus, the unit of observation in these regressions is representative-subcommittee-Congress. We use subcommittee-Congress and representative-subcommittee fixed effects in place of the usual representative and Congress fixed effects to allow for different time trends and legislator effects across policy domains. The purpose of these regressions is to determine whether the effects on total procurement and below median contract spending presented in table 1.4 are being driven by spending specifically under the jurisdiction of the subcommittee a representative has become chair of, or by other procurement spending.

[23] All above and below median results presented in table 1.5 are robust to instead examining the top and bottom terciles of the contract concentration distribution.

Table 1.5: Own-Jurisdiction vs. Other Procurement Results

Variable	Full Sample	Below Median	Above Median
	Panel A: Subcommittee-Specific Spending		
Ranking	-0.121	-0.001	-0.042
	(0.343)	(0.298)	(0.482)
Chair	0.258	0.184	0.428
	(0.184)	(0.220)	(0.493)
N	14493	14475	13496
Adj. R^2	0.865	0.862	0.776
	Panel B: All Other Spending		
Ranking	0.076	0.068	-0.002
	(0.098)	(0.129)	(0.203)
Chair	0.324***	0.343***	0.175
	(0.117)	(0.124)	(0.242)
N	14514	14514	14513
Adj. R^2	0.872	0.876	0.790

Notes: Clustered standard errors in parentheses. *** indicates coefficients statistically different from zero at the 0.01 level.

The estimated coefficients on *Chair* across the two panels suggest that both the aggregate effect on procurement and the finding for below median concentration contracts are being driven by influence over *other* procurement spending, not subcommittee-specific spending. The coefficients on this variable in panel B imply that ascending to chair of a subcommittee induces (1) a 38.3% increase in own-district procurement spending unrelated to that subcommittee and (2) in particular, a 40.9% increase in other below median spending over a two-year congressional term.[24] Given the structure of these specifications, estimates are to be interpreted as relative to the typical amount of (non-)subcommittee-specific spending flowing to a representative's

[24]Note that the findings presented in this section carry no implication, by themselves, as to how total and below median own-district spending are changing following ascent to power. However, since those effects are demonstrated in table 1.4, using the two tables in conjunction allows us to conclude that total and below median own-district procurement spending are increasing, and these increases stem from non-subcommittee-specific spending.

district over a Congress when he or she serves on the subcommittee, but holds no position of power.[25] It is worth mentioning that although it is imprecisely estimated, the coefficient on *Chair* for subcommittee-specific, above median contracts is relatively large in magnitude. This would be consistent with Appropriations subcommittee chairs using the legislative powers afforded to them in an effort to fund projects likely to land in their districts, *i.e.*, selection influence. Moreover, the same caveat mentioned in the previous section applies here as well: coefficients across the above and below median regressions are not statistically different from one another due to imprecisely estimated above median effects. Taken together, however, the results presented in this section point towards the presence of alternative uses of political power such as inter-committee bargaining.

1.7 Conclusion

In this paper, we exploit a within-member, generalized difference-in-differences empirical design to provide causal evidence that becoming the chairperson of a House Appropriations subcommittee induces a substantial increase in total own-district procurement spending over the course of a congressional term. Additional results suggest that this effect is dominated by spending that is not under the jurisdiction of the subcommittee for which a representative has become chair. This would imply the existence of alternative uses of political power, such as inter-committee bargaining.

We propose two channels through which this may occur. The first is "relocation influence," where a contract for a particular good or service will be awarded, and the question is where the contract will land. In the conduct of relocation influence, the greater the number of locations in which the contract can be performed, the greater the scope for political influence. The second is "selection influence," where legislators cannot control where a given contract occurs, so

[25] This is an appropriate counterfactual due to the fact that subcommittee leadership positions are typically awarded on the basis of within-subcommittee seniority, as discussed in the previous section.

instead control whether that contract exists by basing program funding decisions on the likely performance location of associated contracts. In the conduct of selection influence, the more precisely legislators can predict contract performance location, the greater the scope for political influence.

Consequently, the size of the pool of legislative districts that could potentially perform a given contract provides a measure of contract susceptibility to relocation and selection influence. Through constructing a contract concentration index, we are able to separate contracts into those relatively more susceptible to either form of influence. The index is a variant of a Herfindahl index, where instead of calculating industry concentration we are computing contract concentration across congressional districts. Separately estimating our empirical model on contract types above and below median concentration suggests that the effects are being driven by relocation influence.

The political influence over procurement that we document in this paper is surprising given the regulatory infrastructure governing federal procurement spending in the United States. Importantly, however, one cannot conclude that the existence of political influence over procurement—or the fact that it appears to be driven by relocation, in particular—implies regulatory protocol is not being followed. While it is likely that our findings run counter to regulatory intent, such intent may be circumvented through legal means. One example of this would be strategic geographic placement of firm establishments. If, following changes in leadership, firm establishments systematically (re)locate in House Appropriations subcommittee chairs' districts and these firms win government contracts, we would observe the phenomena detailed in this paper; such behavior is entirely legal. On the other hand, if chairs are providing inside information to firms in their districts that helps them win contracts, or are directly overriding the contract award procedures outlined in the Federal Acquisition Regulation (FAR), we would once more obtain the results found in this paper, though such actions may entail legal complications.[26]

[26]In addition to the work by Eckert (2006) and Gordon (2011) cited above, Dube, Kaplan and Naidu (2011) also show that corruption is possible in this context.

Chapter 1, in full, is currently being prepared for submission for publication of the material. Johnson, Grant E.; Roer, Elizabeth A. “Procuring Pork: Contract Characteristics and Channels of Influence.” The dissertation author was the primary investigator and author of this material.

Chapter 2

Institutional Determinants of Municipal Fiscal Dynamics

2.1 Introduction

As of 2008, local governments in the United States spend an amount roughly equal to one-eighth of national gross domestic product (GDP)—accounting for one-fourth of total government spending—and employ more than 14 million people (Glaeser, 2013). In light of these facts, it is clear that local governments, and municipal governments in particular, account for a substantial amount of economic activity in the U.S. and their spending and revenue decisions have the potential to affect a large portion of the population. Municipal governments are charged with funding a number of essential services, public goods and capital projects and often face fiscal limitations imposed on them by higher levels of government. It may, therefore, come as a surprise that the existing literature has not explored how these institutional limitations affect cities over the business cycle.

The particular limitations we study are a subset of what are referred to as "Tax and Expenditure Limitations" (henceforth TELs) and are imposed on municipalities by their state of residence. Specifically, we examine limits on growth in general expenditures or general revenues. One example of such a TEL is a limit in New Jersey on general expenditure increases, which states that increases in appropriations are restricted to rise by no more than five percent or the change in the CPI, whichever is smaller and applies to all municipalities within the state. Our analysis aims to help us better understand some of the forces shaping the evolution of city economies over time. In doing so, we provide evidence on whether or not these TELs achieve their desired effect of limiting the size of local governments—a question which has received differing answers in the literature. Beyond this, we also illuminate a likely unintended consequence of these limitations by widening the scope of the analysis to examine the dynamic response of disaggregated spending categories to shocks to local area employment. This allows us to provide a comprehensive examination of how these limitations interact with economic fluctuations, which can be used to both better evaluate the effects of these constraints and inform the design of future fiscal responsibility measures at the local level.

We measure economic fluctuations using instrumented log changes in commuting zone employment, where our instrument stems from the shift-share decomposition of employment growth developed in Bartik (1991). These employment changes are then mapped to municipalities within a given commuting zone. Using these estimates in conjunction with disaggregated municipal spending data, we construct a Jordà (2005) local projections specification to estimate the impact of the aforementioned TELs on municipal fiscal behavior in response to an employment shock contemporaneously and over time. We find that limitations on increases in general expenditures or revenues have strong effects. In response to a positive employment growth shock of one percent, we estimate a large, persistent, negative and statistically significant effect on growth in capital outlays that reaches a peak of roughly -3.5% per-capita one year after a shock. That is, spending growth on capital outlays falls by 3.5% per-capita in TEL-constrained municipalities relative to those unconstrained the year following a shock. A similar pattern emerges for transportation and public maintenance spending—relatively capital-intensive spending categories—suggesting they are absorbing the brunt of the capital response.

There is little differential effect on public safety and administrative expenditures and only a modest negative effect on general expenditures, indicating that TELs do not seem to be constraining the overall size of municipal governments much following an expansionary shock. This finding falls somewhere between that of Kousser, McCubbins and Moule (2008) and those of earlier studies by Misiolek and Elder (1988), Elder (1992) and Shadbegian (1998). Taken together, our results suggest that broad fiscal responsibility interventions, such as the imposition of limits on general expenditures or revenues, may be ineffective in reducing the size of government. Rather, they may instead prompt governments to reduce investment in order to maintain their current levels of public safety and administrative spending.

A number of early papers sought to characterize the impact of TELS on local finances.[1] However, the effects captured in this literature represent average effects of the implementation

[1] See, for example, Joyce and Mullins (1991), Elder (1992), Mullins and Joyce (1996), Shadbegian (1998), Shadbegian (1999) and Skidmore (1999).

of TELs on fiscal variables; how these limitations impact the ability of local governments to respond to economic fluctuations—and the dynamic adjustment induced by the interaction of these two forces—has gone largely unstudied. Buettner and Wildasin (2006) study dynamic municipal government adjustment to fiscal shocks, though no attention is paid to the impact of TELs on adjustment and the analysis focuses on more aggregated fiscal categories. At the state level, Poterba (1994), Bohn and Inman (1996) and Clemens (2012) study the impact of strict balanced-budget requirements on state finances in the face of economic downturns. This literature focuses on describing how state budgets respond to economic fluctuations, given the presence of binding limits (e.g., documenting whether adjustment has occurred largely through the revenue or expenditure side of the budget and what the composition of budget cuts induced by recessionary shocks is). We seek to answer a similar question at the municipal level, though with a decidedly different methodological approach in addition to consideration of expansionary shocks.

The rest of the paper is organized as follows. Section 2.2 provides the requisite background information on municipal governments and TELs. Section 2.3 discusses the data used in this project and how we construct the employment shocks mentioned above. Section 2.4 details our empirical strategy. Section 2.5 presents our results and section 2.6 concludes.

2.2 Background

2.2.1 Municipal Governments

We motivated our examination of municipal governments by noting that local government spending amounts to a significant fraction of GDP and that municipal governments feature prominently in this spending total. State and local government spending over time, as a share of GDP, is plotted in Figure 2.1.[2]

[2]This figure does not include spending on social welfare.

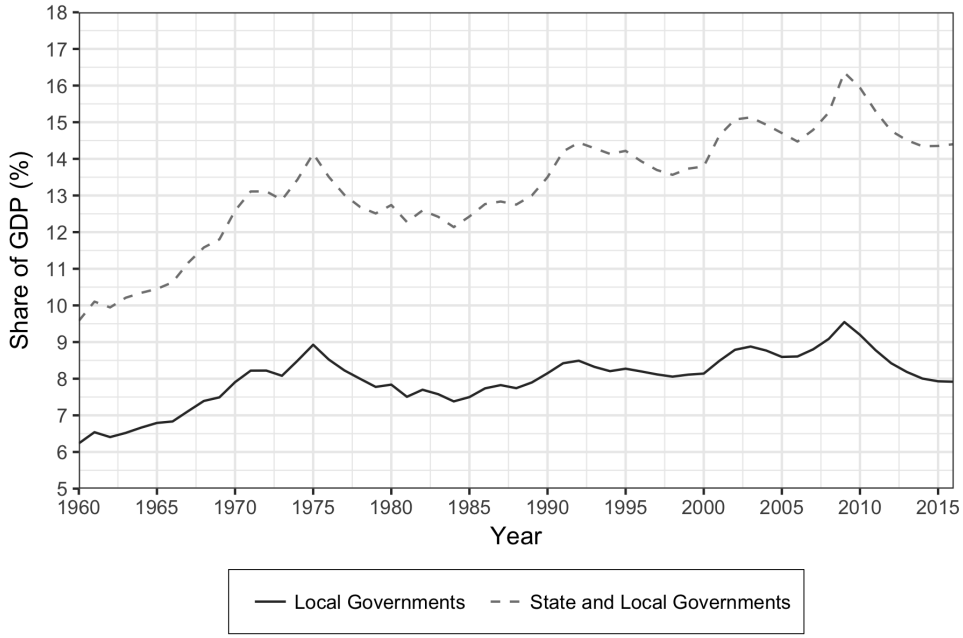


Figure 2.1: State and Local Government Spending, 1960-2016

Source: *Federal Reserve Economic Data*, Federal Reserve Bank of St. Louis, 2018

Municipal governments are but one form of local government—the other major forms being county and town governments and school and special districts—so it is worth discussing why we choose to focus on cities as opposed to another form of local government. Our reasons are twofold. First, municipal governments spend and raise more money than any other form of local government. Second, municipal governments are more numerous than are the other forms of local governments and the number of municipalities has been fairly constant over time. Given that municipal governments account for a substantial amount of economic activity, we are particularly concerned with examining how institutional limitations affect a city's ability to respond to business cycle movements—making our focus on municipal governments a natural one. The particulars of TELs are the focus of the following subsection; here we focus on the functions of municipal governments.

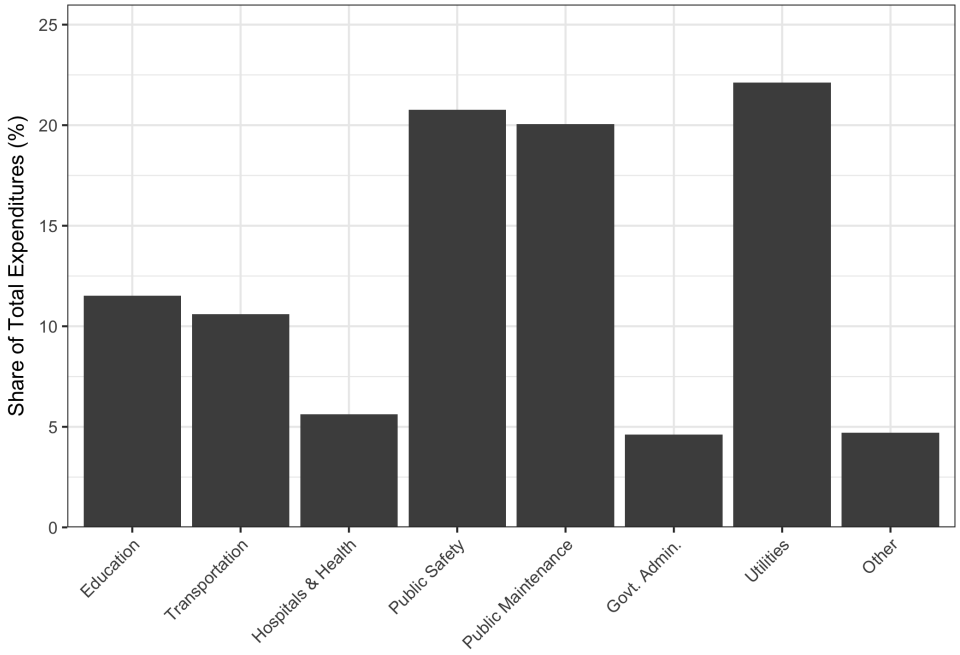


Figure 2.2: Municipal Government Spending, 2007

Source: *Annual Survey of State and Local Government Finances*, U.S. Census Bureau, 2007

There were 19,492 municipal governments as of 2007, a number that has been relatively stable over the past 50 years. Glaeser (2013) notes that municipal government spending can be broadly grouped into three main categories: basic city services, social welfare spending and education. Examples of basic city services include police, fire and waste management, while social welfare spending includes explicit social welfare spending as well as spending on hospitals and housing services. Virtually all city governments provide basic services like those listed above, but that is not the case for the latter two categories. Large cities tend not to spend much, if at all, on either of these categories—education spending, for instance, often falls under the directive of independent school boards in these places. Another type of spending that we will be especially concerned with in this paper, given the incentives provided by local fiscal institutions, is spending on capital outlays. Capital outlays comprise a portion of spending in many of the categories and examples listed above, but more generally include spending on construction and infrastructure pertaining to highways, buildings and bridges. Specifically, the expenditure

categories we study are general expenditures, capital outlays, transportation, public safety, public maintenance and government administration. Figure 2.2 shows the percentage breakdown of municipal spending by function for 2007, a year in which all city governments were sampled as a part of the Census of Governments.

2.2.2 Tax and Expenditure Limitations (TELs)

Municipal governments face unique institutional limitations, often imposed on them by higher levels of government. The purpose of these limits is largely to constrain the size of local governments. Much like their state counterparts, city governments often face balanced-budget requirements and are formally restricted from running operating expenditure deficits. Additionally, many municipal governments are limited in their ability to borrow, with these limitations written into their state's constitution. Fiscal restrictions at the municipal level, however, usually take a more disaggregated form relative to state-level measures, where restrictions largely apply to the budget deficit as a whole. Mullins and Wallin (2004) catalogue such restrictions, known as "Tax and Expenditure Limitations" (TELs), drawing on the classification system developed in Joyce and Mullins (1991). The seven basic forms of TELs are listed below; these measures are state policies that apply to all municipalities within the state.

1. Overall property tax rate limits applying to all local governments
2. Specific property tax rate limits applying to specific types of local government (municipalities, counties, school districts, and special districts) or specific functions
3. Property tax levy (revenue) limits
4. General revenue increase limits
5. General expenditure increase limits
6. Limits on assessment increases

7. Full disclosure (truth in taxation)

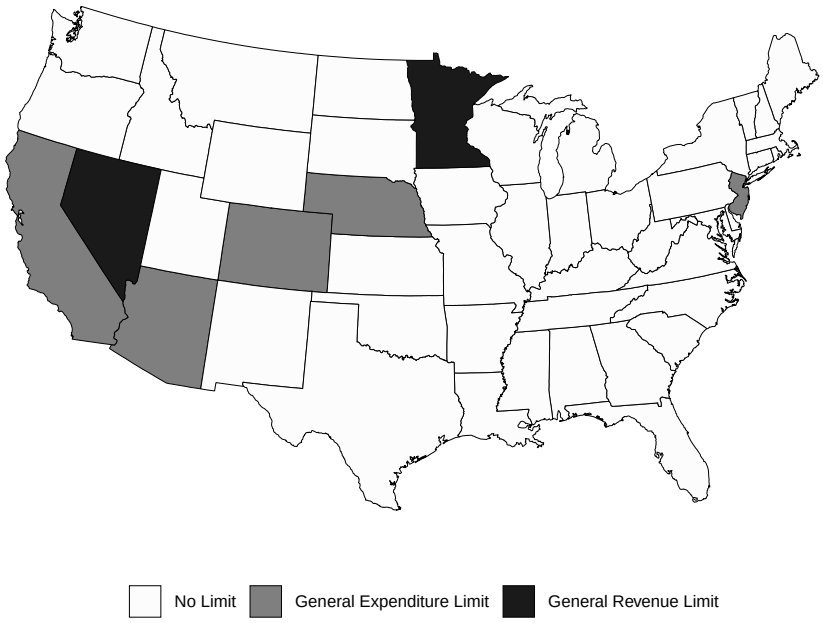


Figure 2.3: States Implementing General Expenditure and Revenue TELs

Source: Adapted from Mullins and Wallin (2004)

Oftentimes, an explicit goal of imposing property tax TELs is to diversify revenue streams by inducing a shift in revenue away from property taxes and towards sources such as charges, user fees and utilities.[3] For this reason, we restrict attention to limits on increases in general expenditures and revenues, which more accurately reflect constraints on the government as a whole. In our empirical analysis, we group general expenditure and revenue growth limits into one category since they serve similar functions in principle. Figure 2.3 shows where these limits exist and table 2.1 provides further information as to when they were put into (and in some cases, taken out of) place. We ignore full disclosure (truth in taxation) since, in practice, this does not represent a binding limitation on municipal governments.

[3]This effect has been documented in a number of studies, including Mullins and Joyce (1996), Shadbegian (1999) and Skidmore (1999).

Table 2.1: States Implementing General Expenditure and Revenue TELs

State	Type of Limit	Passed	Repealed
Arizona	General Expenditure	1921	
California	General Expenditure	1979	
Colorado	General Expenditure	1992	
Minnesota	General Revenue	1971	1993
Nebraska	General Expenditure	1996	
Nevada	General Revenue	1984	1989
New Jersey	General Expenditure	1976	

Source: Adapted from Mullins and Wallin (2004)

2.3 Data

Annual, disaggregated expenditure data for a large number of U.S. municipalities spanning the years 1974-2004 come via the *Annual Survey of State and Local Government Finances*, courtesy of the U.S. Census Bureau. Annual county-level employment data by both North American Industry Classification System (NAICS) and Standard Industrial Classification (SIC) industry codes for the same time frame also comes from the U.S. Census Bureau, through their data product titled *County Business Patterns*. We follow Autor, Dorn and Hanson (2013) in mapping and aggregating county-level employment data to the corresponding commuting zones.

2.3.1 Shock Construction

In order to examine how TELs affect municipalities' ability to respond to economic fluctuations, we must first define what we mean by "economic fluctuations." We choose to measure economic fluctuations with changes to the local level of employment. Changes in the local level of employment would undoubtedly be an endogenous regressor in any regression in which a municipal fiscal variable appears as the dependent variable, biasing our estimates.

To overcome this problem, we instrument for changes in employment following Bartik (1991). Specifically, the employment growth predictions used to form the instrument can be written as:

$$Bartik_{c,s,t} = \sum_{j} Share_{j,c,s,1974} \times \Delta log(Emp_{j,n,t}) \tag{2.1}$$

where *Emp* represents the absolute level of employment, j indexes industries, c indexes commuting zones, s indexes states, t indexes time (annual) and n indicates a national total. We take 1974, the first year of our sample, as the base year and utilize SIC three-digit industry codes when estimating (2.1). Predicted employment growth in commuting zone c at time t is the sum across industries of national employment growth in each industry at time t, weighted by industry j's share of employment in commuting zone c in 1974. The employment growth prediction is a function of initial industry composition and industry-specific national growth rates. Thus, it removes the idiosyncratic time-varying components of growth. This leaves our employment growth prediction as being a function of the growth predicted by the all-industry national average and industry-specific national growth rates, hence removing the endogenous component of the regressor.[4] We then assign the same commuting zone-level shock to each municipality within a given commuting zone.

Note that in the equation given above, c indexes *commuting zones*, whereas our analysis concerns *municipalities*. Due to data limitations, our Bartik shocks are constructed at the commuting zone level, the reason being that employment data by industry code (a necessary component of the Bartik instrument) do not exist at the municipal level, or any level more disaggregated than the county level. We choose to construct our shocks at the commuting zone-level since we believe commuting zones more accurately describe the relevant labor market, though our results are robust to using county-level shocks.[5]

[4]This may not be obvious from the structure of equation (2.1), which is the result of terms canceling in the shift-share decomposition.

[5]We follow a similar approach when using county-level shocks; we assign the same county-level shock to each municipality within a given county.

2.3.2 Descriptive Statistics

In constructing our final sample, we choose to keep municipalities with no more than two non-surveyed years during our sample period and no more than ten years of missing data in any fiscal category we examine. For municipalities with missing values in one or more fiscal category, we impute values linearly using surrounding years' values. The end result is a "relatively balanced" panel of 1,150 municipalities from 1974-2004; table 2.2 presents summary statistics for our entire sample for the years 1974 and 2004.[6] The summary statistics for our sample in 2004 align closely with the spending breakdown displayed in figure 2.2 for the universe of municipal governments in 2007.

General expenditures are defined as "all city expenditure other than the specifically enumerated kinds of expenditure classified as *Utility Expenditure*, *Liquor Stores Expenditure*, and *Employee-Retirement* or other *Insurance Trust Expenditure*." Transportation is the sum of direct expenditures on highways, airports and parking. Public safety is the sum of direct expenditures on police, fire, corrections and protective inspection and regulation. Public maintenance is the sum of direct expenditures on parks and recreation, housing and community development, solid waste management and sewerage. Government administration is the sum of direct expenditures on financial administration, judicial and legal matters and general public buildings. These definitions follow the annual summary report for the *Annual Survey of State and Local Government Finances*, issued by the U.S. Census Bureau.

[6] Sample sizes differ slightly from the total number of observations (1,150) when there are missing values that cannot be imputed.

Table 2.2: Summary Statistics

	N	Mean	Std. Dev.	Min	Max
***Panel 1**: 1974 Summary Statistics*					
Population	1149	75972.68	283806.3	1402	7646818
Exp./Rev. TEL	1150	0.047	0.213	0	1
Spending Variables					
General Expenditures	1149	909.405	695.867	108.438	8554.54
Capital Outlays	1135	207.870	314.486	0.930	8220.699
Transporation	1148	113.759	108.540	8.529	2505.386
Public Maintenance	1145	188.107	160.451	1.112	1643.869
Public Safety	1149	160.330	86.359	0.143	1351.332
Government Administration	1136	33.516	35.463	0.263	427.921
***Panel 2**: 2004 Summary Statistics*					
Population	1086	99401.15	319603.3	1312	8084316
Exp./Rev. TEL	1150	0.135	0.342	0	1
Growth Variables					
CZ Employment Growth	1150	0.011	0.025	-0.162	0.266
Predicted Growth	1150	0.004	0.011	-0.078	0.064
Spending Variables					
General Expenditures	1086	1706.146	2497.151	452.96	73165.72
Capital Outlays	1066	276.510	504.984	0.610	13539.95
Transporation	1086	171.878	217.111	6.093	5594.251
Public Maintenance	1086	330.227	235.43	18.703	3480.346
Public Safety	1085	337.078	175.591	0.056	2751.601
Government Administration	1074	74.625	70.307	0.044	946.524

Notes: Summary statistics for cities in our sample for years 1974 and 2004. Exp./Rev. TEL is an indicator taking value one if a city is limited by a general expenditure or general revenue TEL in that year. All spending variables are in real, per-capita 2004 U.S. dollars. CZ employment growth is the first difference of the natural logarithm of commuting zone employment. Predicted growth is the Bartik growth prediction as defined in equation (2.1). Note that these quantities are undefined for 1974, as we take that as the base year. Alaska and Hawaii have been excluded from the sample, as are cities with ten or more zero values (which could denote missing data or a true zero) for any spending variable. Remaining zero values are imputed linearly from the surrounding years' values for that city. Any remaining missing values arise when a city did not appear in the sample at all in that year. Values for these years were not imputed.

2.4 Empirical Strategy

Broadly, our goal is to estimate the effect of local fiscal institutions on municipal governments' response to cyclical movements. Specifically, we examine the effect of general expenditure and revenue TELs on disaggregated city spending categories in response to a local employment shock. The question our statistical model speaks to is, what is the differential response in growth in a given spending category following a shock to local area employment growth between a municipality subject to a limit on increases in general expenditures or revenues and one which is not? Our baseline specification draws on the local projections method formulated in Jordà (2005) and used similarly in Leduc and Wilson (2013). Our estimating equation is given by:

$$\begin{aligned}\log(y_{i,c,s,t+h}) - \log(y_{i,c,s,t-1}) = &\alpha_i^h + \alpha_t^h + \sum_{q=1}^{p+1} \beta_q^h \log(y_{i,c,s,t-q}) \\ &+ \delta_1^h 1\{TEL_{s,t}\} + \delta_2^h \Delta\log(\widehat{Emp}_{c,s,t}) \\ &+ \delta_3^h 1\{TEL_{s,t}\} \times \Delta\log(\widehat{Emp}_{c,s,t}) + \varepsilon_{i,c,s,t+h},\end{aligned} \tag{2.2}$$

where $y_{i,c,s,t}$ is per-capita spending in a category y in municipality i in commuting zone c in state s at time t. t indexes years and $h = 0, 1, \ldots, 5$ denotes the horizon of the forecast. The expenditure categories we examine are general expenditures, capital outlays, transportation, public safety, public maintenance and government administration. $\Delta\log(\widehat{Emp}_{c,s,t})$ is the instrumented log change in commuting zone employment, where employment growth is instrumented for using $Bartik_{c,s,t}$ as in equation (2.1) in our first-stage. $1\{TEL_{s,t}\}$ equals one if state s has a general expenditure or revenue TEL at time t and zero otherwise. We set $p = 2$ and cluster standard errors at the commuting zone level. α_i^h and α_t^h are municipality and year fixed-effects, respectively.

Our coefficient of interest is δ_3^h; its interpretation is the following. If employment growth increases by one percent at time t, spending growth in category y in a TEL-constrained municipality changes by δ_3^h percent relative to a municipality without either TEL at horizon

h—i.e., spending growth in category y in a municipality with a general expenditure or revenue TEL is δ_3^h percent higher/lower than that in a municipality without one h years after the shock. At horizon $h = 0$, this model reduces to a fairly standard static specification. For $h = 1, \ldots, 5$, this model produces forecasts of the effect of a shock to employment growth at time t on category y at time $t + h$, conditional on information through time t. Plotting δ_3^h for $h = 0, 1, \ldots, 5$ therefore provides impulse responses for the relative effect of the shock across municipalities with and without general expenditure or revenue TELs on impact through five years afterwards. We feel that it is crucial to examine dynamic effects for a complete analysis of how institutional limitations affect municipalities—only by doing so can we get a sense of how institutions influence these governments' behavior over the business cycle. By coupling dynamic analysis with disaggregation, our estimation strategy allows us to see precisely where the shocks are felt within constrained governments, in addition to the magnitude and persistence of the effects.

2.5 Results

2.5.1 Main Results

This section presents estimates from the baseline specification given in equation (2.2). The spending categories we examine are general expenditures, capital outlays, transportation, public maintenance, public safety and government administration. Coefficient estimates and standard errors are reported in tables 2.3 and 2.4. Our coefficient of interest is δ_3^h, which corresponds to the coefficient on the variable TEL$\times\Delta log(Emp)$ in the table. Figure 2.4 plots the impulse response coefficients δ_3^h for $h = 0, 1, \ldots, 5$, along with accompanying 90% confidence bands.

Table 2.3: Baseline Results

	$h=0$	$h=1$	$h=2$	$h=3$	$h=4$	$h=5$
***Panel 1**: Expenditures*						
$\Delta log(Emp)$	-0.189	-0.237	-0.011	0.044	0.410**	0.565***
	(0.155)	(0.154)	(0.131)	(0.175)	(0.192)	(0.162)
TEL $\times \Delta log(Emp)$	-0.340*	-0.815***	-0.410*	-0.078	0.343**	-0.020
	(0.184)	(0.292)	(0.214)	(0.214)	(0.169)	(0.258)
TEL	0.037*	0.070***	0.078***	0.076***	0.073***	0.093***
	(0.020)	(0.024)	(0.021)	(0.023)	(0.027)	(0.035)
N	34153	33003	31853	30703	29553	28403
***Panel 2**: Capital Outlays*						
$\Delta log(Emp)$	-0.148	-0.280	1.067**	-0.087	0.130	1.663***
	(0.496)	(0.506)	(0.526)	(0.569)	(0.651)	(0.498)
TEL $\times \Delta log(Emp)$	-2.406***	-3.527***	-2.515***	-0.248	1.073*	0.309
	(0.631)	(0.784)	(0.756)	(0.702)	(0.551)	(0.621)
TEL	0.126***	0.198***	0.185***	0.128**	0.112**	0.137***
	(0.025)	(0.036)	(0.049)	(0.050)	(0.047)	(0.050)
N	33971	32821	31671	30521	29371	28221
***Panel 3**: Transportation*						
$\Delta log(Emp)$	-0.217	-0.098	0.241	0.577**	0.323	0.756***
	(0.212)	(0.238)	(0.277)	(0.264)	(0.530)	(0.285)
TEL $\times \Delta log(Emp)$	-0.320	-1.672***	-1.465***	-0.427*	0.227	-0.019
	(0.261)	(0.465)	(0.355)	(0.253)	(0.318)	(0.269)
TEL	0.026*	0.089***	0.096***	0.086***	0.075***	0.086***
	(0.014)	(0.027)	(0.030)	(0.028)	(0.024)	(0.027)
N	34148	32998	31848	30698	29548	28398

Notes: Dependent variables are given by each panel heading. Units of all dependent variables are real, per-capita 2004 U.S. dollars. h represents the forecast horizon, as outlined in equation (2.2). TEL is an indicator taking value one if a city faces a general expenditure or general revenue TEL during the year in which the shock occurs. *Emp* is employment in the commuting zone in which a city resides. Municipality and year fixed effects omitted. Standard errors are clustered at the commuting zone level and presented in parentheses. *Significance*: * $p<0.1$, ** $p<0.05$, *** $p<0.01$.

Table 2.4: Baseline Results (Continued)

	$h=0$	$h=1$	$h=2$	$h=3$	$h=4$	$h=5$
***Panel 4**: Public Maintenance*						
$\Delta log(Emp)$	-0.412	-0.258	-0.285	-0.227	0.684***	0.411
	(0.261)	(0.273)	(0.295)	(0.303)	(0.264)	(0.252)
TEL $\times \Delta log(Emp)$	-0.563*	-1.456***	-0.962***	-0.521	-0.225	-0.778*
	(0.328)	(0.355)	(0.366)	(0.400)	(0.317)	(0.429)
TEL	0.051***	0.096***	0.095**	0.090**	0.099**	0.131***
	(0.016)	(0.026)	(0.039)	(0.046)	(0.043)	(0.037)
N	34132	32982	31832	30682	29532	28382
***Panel 5**: Public Safety*						
$\Delta log(Emp)$	-0.053	0.019	0.151	0.232*	0.507***	0.252
	(0.126)	(0.126)	(0.114)	(0.134)	(0.166)	(0.177)
TEL $\times \Delta log(Emp)$	0.124	-0.131	0.129	-0.067	-0.054	-0.211
	(0.150)	(0.389)	(0.412)	(0.217)	(0.267)	(0.229)
TEL	0.006	0.020	0.019	0.031*	0.037*	0.046***
	(0.013)	(0.018)	(0.020)	(0.016)	(0.019)	(0.017)
N	34137	32987	31837	30687	29537	28387
***Panel 6**: Government Administration*						
$\Delta log(Emp)$	0.156	0.411	0.280	0.617**	0.791***	0.560*
	(0.291)	(0.295)	(0.280)	(0.265)	(0.275)	(0.294)
TEL $\times \Delta log(Emp)$	0.763*	0.663*	1.169*	-0.123	0.585**	0.412
	(0.415)	(0.398)	(0.679)	(0.419)	(0.265)	(0.254)
TEL	-0.046	-0.048	-0.060	-0.031	-0.054	-0.043
	(0.044)	(0.059)	(0.072)	(0.066)	(0.056)	(0.057)
N	34020	32870	31720	30570	29420	28270

Notes: Dependent variables are given by each panel heading. Units of all dependent variables are real, per-capita 2004 U.S. dollars. h represents the forecast horizon, as outlined in equation (2.2). TEL is an indicator taking value one if a city faces a general expenditure or general revenue TEL during the year in which the shock occurs. *Emp* is employment in the commuting zone in which a city resides. Municipality and year fixed effects omitted. Standard errors are clustered at the commuting zone level and presented in parentheses. *Significance*: * $p<0.1$, ** $p<0.05$, *** $p<0.01$.

Our results show that following a positive shock to employment growth of one percent, growth in general expenditures in municipalities faced with a limit on increases in general

expenditures or revenues only modestly falls behind that in municipalities with no such limits. This indicates that TELs do not seem to be constraining the size of municipal governments much following an expansionary shock, which contributes to the outstanding debate on whether or not TELs achieve their intended effect of constraining the size of local governments. Specifically, general expenditures growth falls by 0.815% in constrained municipalities relative to unconstrained municipalities one year after a shock, but rebounds to grow 0.343% quicker four years following a shock. The latter result may reflect "catch up" spending that occurs once the binding constraint has slackened.

There are two primary takeaways from our findings for the disaggregated spending categories listed above. First, there is by and large no differential effect on public safety and administrative expenditures. The only significant result at any horizon for either of these two categories is the 0.585% relative increase in administrative spending growth four years after an initial shock. The timing of this effect comports with the result for general expenditures and is again likely reflective of catch up spending occurring once the constraint has slackened, particularly given the nature of the shock we consider.[7] Second, capital-related spending in municipalities facing a general expenditure or revenue TEL falls substantially and persistently relative to spending in municipalities without either of these limits. Significant effects on capital outlays persist for two years following a shock, reaching a peak relative reduction in growth of 3.527% per-capita after one year. Transportation and public maintenance expenditures—two capital-intensive spending categories—track this pattern, indicating they are absorbing the bulk of the capital response. Maximum relative reductions in transportation and public maintenance spending growth are 1.672% and 1.456% per-capita, respectively; both occur one year after a shock.

[7] If administrative staffing and spending roughly follow a step-function based on population, per-capita administrative spending would be expected to increase following a positive shock to employment growth. This could appear as a significant relative increase in administrative spending at longer horizons if initial desired spending increases must be postponed due to the presence of a binding constraint on increases in general expenditures or revenues.

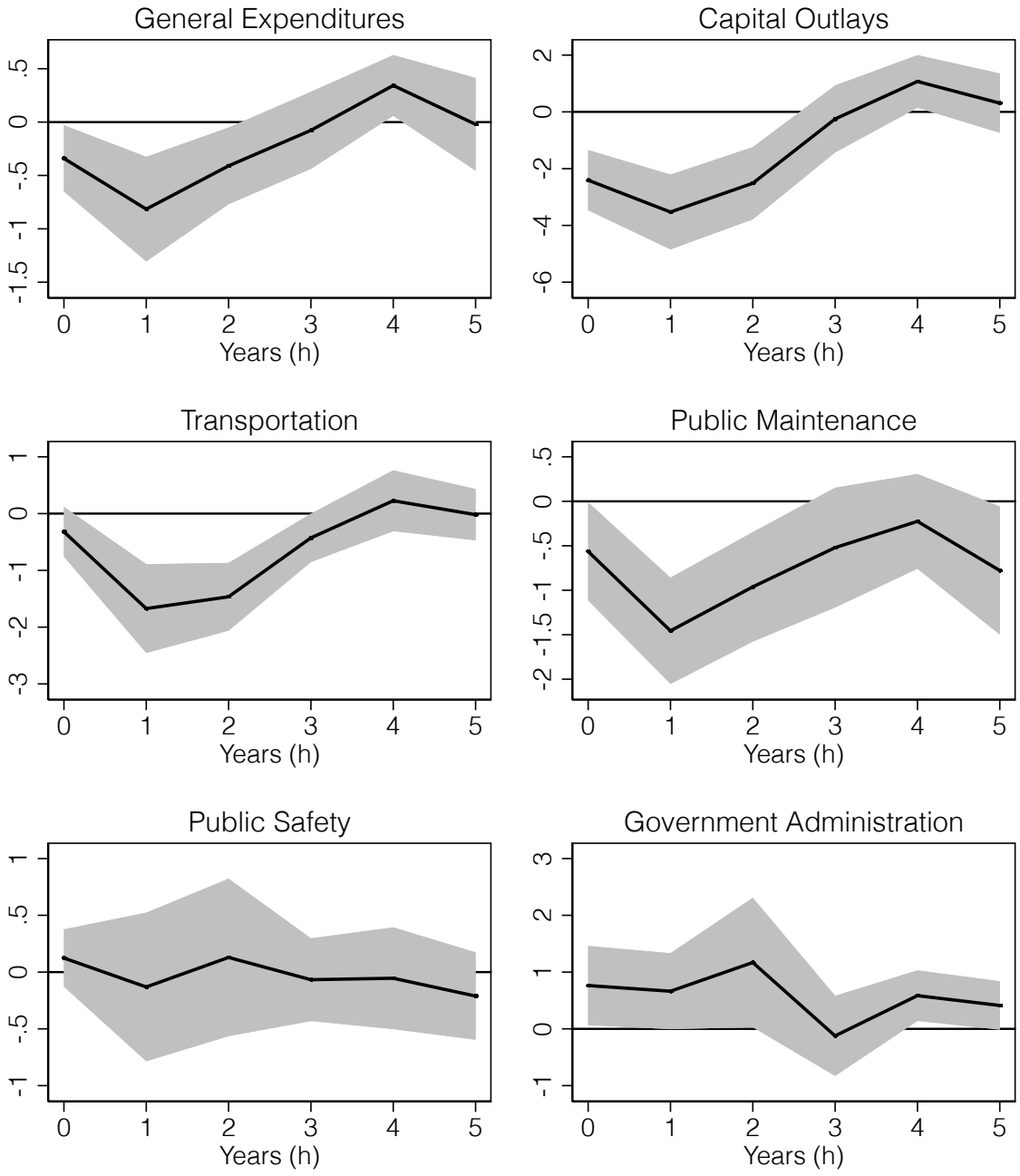


Figure 2.4: Baseline Results - Impulse Response Functions

Notes: Impulse response functions for δ_3^h, as specified by equation (2.2). The x-axis represents the forecast horizon h, *i.e.*, the number of years following an employment shock. Point estimates are represented by the thick black line, with 90 percent confidence bands represented by the shaded gray area.

2.5.2 Threats to Identification

In this section, we outline two potential threats to identification and present evidence that neither is a concern in our case. First, the implementation of a TEL is potentially endogenous. Specifically, state governments may respond to large increases in local government expenditures by passing a TEL in order to curb what they consider to be "out of control" spending. This would introduce bias into our estimates.

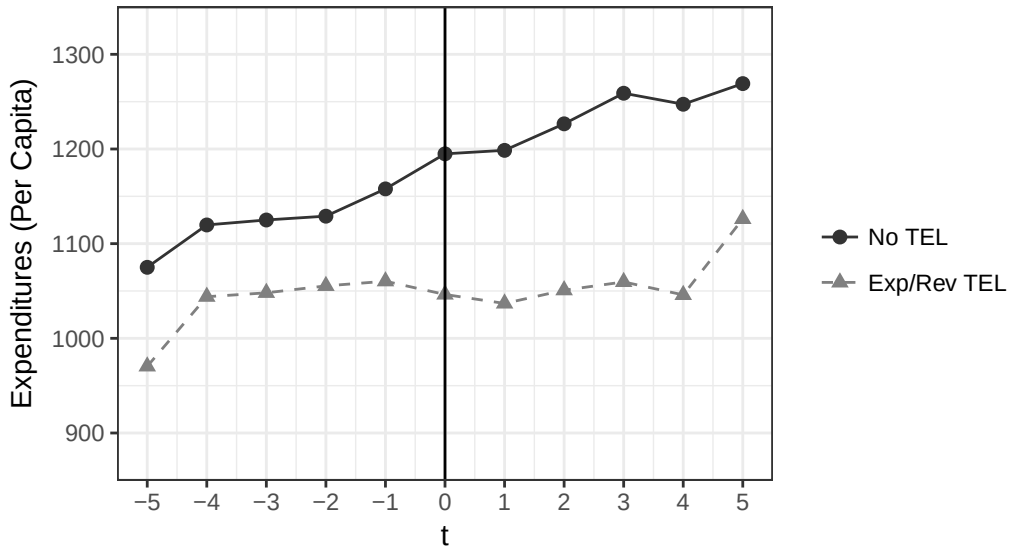


Figure 2.5: Comparison of Trends

Notes: Average per-capita expenditures for municipalities in states implementing general expenditure or general revenue TELs (gray dashed lines and triangles) and municipalities in all other states (black solid lines and points). The x-axis represents the number of years before or after a TEL is implemented.

To address this concern, we compare spending patterns of municipalities in states implementing general expenditure or general revenue TELs with those in states that do not in the years immediately before and after the limits are passed. Figure 2.5 plots average per-capita expenditures for municipalities in TEL-implementing states and in other states in order to examine expenditure trends surrounding the five TELs passed during our sample period.[8] The x-axis represents the number of years before or after the implementation of a TEL, with $t = 0$ being

[8]These are the TELs passed in 1976, 1979, 1984, 1992 and 1996.

the year of implementation. This figure shows clear parallel trends in expenditures between the two groups. Only when the TEL is implemented do the trends begin to diverge. This shows that, on average, states do not respond specifically to upticks in spending by local governments by passing TELs, and that before TELs are passed, the dynamics of municipal spending are similar in TEL and non-TEL states.

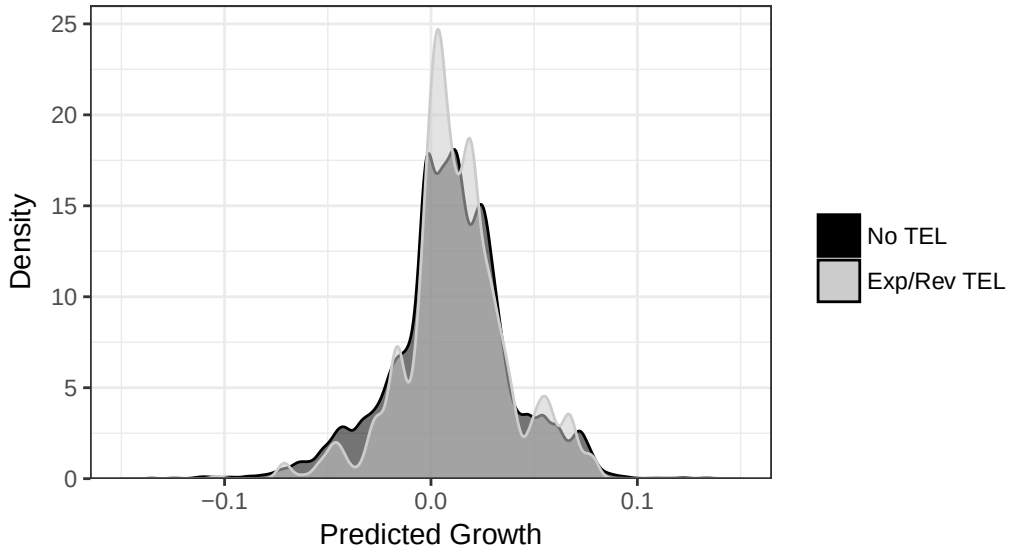


Figure 2.6: Comparison of Shock Densities

Notes: Overlaid densities of predicted growth (calculated according to equation (2.1)) in states with (light, in front) and without (dark, behind) general expenditure or general revenue TELs.

An additional concern is that local governments in TEL states receive systematically different shocks than those in non-TEL states. Particularly, we might be concerned that because there are more non-TEL states than TEL states, the distribution of shocks between these groups differs, either from an underlying difference in the economies of the states within those groups, or simply as a consequence of the few observations for TEL-states. In either case, our estimates could be biased. To test for this, in figure 2.6 we plot the distribution of growth predictions, as calculated by equation (2.1), for municipalities in states with general expenditure or general revenue TELs and those in states without TELs. The distributions are overlaid so that they may be more easily compared. The general shapes, centers and spreads of the two distributions align

closely. The distribution for TEL states is more uneven, but this is likely attributable to the sample size. This figure should confirm that, on average, TEL-facing municipalities and their counterparts in other states face similar shocks.

2.6 Conclusion

Municipal governments account for a substantial amount of economic activity in the United States and are entrusted with funding a number of essential services, public goods and capital projects. Furthermore, they often face fiscal limitations imposed on them by higher levels of government. In this paper, we study how limits on general expenditures or revenues growth affect cities in response to business cycle movements. These limits are state-level policies that apply to all municipalities within a state and comprise a subset of what are referred to more generally as "Tax and Expenditure Limitations" (TELs).

We measure economic fluctuations using instrumented log changes in commuting zone employment, drawing on the methodology developed in Bartik (1991). We then use these estimates, along with disaggregated municipal spending data, to formulate a local projections impulse response specification to study the effect these limits have on municipalities in response to an employment shock within-period and over time. Our findings are summarized as follows. Following an expansionary shock, the overall size of municipal governments (as measured by general expenditures) faced with one of these limits grows only slightly more slowly than it does in those without either limit. Moreover, we find largely no differential effect for public safety and administrative expenditures. The primary effect of the TELs is on capital spending; cities faced with general expenditure or revenue TELs lag substantially and persistently behind their unconstrained counterparts in capital outlays growth following a positive shock to employment growth. Relative reductions in capital outlays occur predominantly through transportation and public maintenance expenditures, specifically.

TELs are fiscal responsibility measures intended to constrain the size of local govern-

ments. What we have shown in this paper is that the most restrictive of these limits are only moderately successful in doing so. Rather, as the economy expands, such limits appear to induce reductions in public investment in order to sustain prior levels of public safety and administrative spending. We hope our findings will be used to inform the design of future fiscal responsibility measures at the local level. Our results suggest that targeting aggregate expenditure or revenue categories may lead to potentially undesirable changes in the underlying spending mix. As a result, directing these limits instead towards more disaggregated spending categories may prove to be more effective in achieving the underlying policy intent. One possibility would be coupling a limit on general expenditure increases with an explicit limit on increases in administrative spending.

Chapter 2, in full, is currently being prepared for submission for publication of the material. Johnson, Grant E.; Bigenho, Jason M. "Institutional Determinants of Municipal Fiscal Dynamics." The dissertation author was one of two primary investigators and authors of this material.

Chapter 3

Procuring Protection? Evidence from the U.S. House of Representatives

3.1 Introduction

How do political considerations influence the allocation of federal funds? This question lies at the heart of the long-standing literature on distributive politics and is integral to understanding political institutions. Given the relative control over spending afforded to the majority party[1] and the House of Representatives[2] in the United States, two natural questions researchers have asked are (1) does the House majority party exploit these advantages to distribute funds to its members' districts and (2) if so, which districts receive additional funds? In so far as a positive linkage exists between current district spending and future electoral success,[3] we would expect the answer to the first question to be "yes," and this is indeed what researchers have found.[4] This leads to the second question.

There have traditionally been two primary competing theories of party distributive behavior. The first, put forth in Lindbeck and Weibull (1987) and Dixit and Londregan (1996), predicts that parties will direct resources towards areas where there are many swing voters in an effort to maximize party vote share. The second, espoused by Cox and McCubbins (1986), hypothesizes that parties will predominantly steer funds to regions containing core supporters of the party, since parties are risk-averse and staunch supporters represent the least-risky "investment" of available funds. In the context of the party holding the majority, Lazarus (2009) invokes leading theories of partisan congressional organization[5] and Conditional Party Government[6] to implicitly argue in favor of the former theory. If party leaders are given the authority to advance party goals—such as retaining majority status—one would expect vulnerable members' districts to receive disproportionately more pork, *ceteris paribus*, in an effort to achieve this goal. He finds that vulnerable legislators in the majority party receive greater earmarks,

[1] Kiewiet and McCubbins (1991); Levitt and Snyder Jr. (1995); Balla et al. (2002); Albouy (2013).

[2] Cox and McCubbins (1993); Cox and McCubbins (2005).

[3] Bickers and Stein (1996); Levitt and Snyder Jr. (1997).

[4] Albouy (2013); Dynes and Huber (2015).

[5] Specifically, the Procedural Cartel model contained in Cox and McCubbins (1993) and Cox and McCubbins (2005).

[6] Aldrich and Rohde (2000); Aldrich and Rohde (2001).

which constitute a small fraction of overall grant spending. However, to date little is known empirically about which *types* of spending are viewed as being the most electorally beneficial. In this paper, I ask whether vulnerable majority party representatives receive greater federal grant and loan spending, more generally, and/or greater federal procurement spending. I draw on differences between spending types in hopes of eliciting the features of spending that provide the best opportunities for credit-claiming.

Procurement spending is the U.S. federal government's purchase from private sector firms of goods and services needed to conduct federal government operations. In 2012, federal procurement spending amounted to roughly $800 billion and thus accounted for 40% of all federal discretionary spending and 4% of GDP. One concern may be that, unlike earmarks, legislators cannot geographically target procurement spending. Indeed, procurement regulations intend to promote the cost-effective purchase of production inputs, with little consideration given to the resulting geographic distribution of spending. However, Johnson and Roer (2018) show that despite these regulations, House Appropriations subcommittee chairs are able to increase own-district procurement spending. Since House Appropriations subcommittee chairs are always members of the House majority party and, furthermore, majority party representatives hold the majority of seats on each of these subcommittees, it is reasonable to assume that party leaders have the ability to increase procurement spending in vulnerable representatives' districts.[7] If majority party leaders view increased spending as a way to protect vulnerable representatives, the question then becomes which type of spending is most effective in doing so.

Lee (2003) argues that earmarks are an especially opportune area for credit-claiming in the House. She postulates that this is due, in part, to the fact that House districts are not federal administrative units in the way that states are, which makes credit-claiming for other types of grant expenditures more difficult at this level. One goal of the present study is thus to test this prediction on a broader scale than has been done in the current literature. Grants and loans, on

[7]Nonetheless, the presence of *de jure* procurement regulations may lessen the scope for credit-claiming by representatives.

whole, differ from procurement in important ways. Johnson and Roer (2018) note that while grant and loan spending frequently finances local public goods, procurement spending typically goes towards national level ventures such as defense and funding the federal bureaucracy. As Roer and Sandholtz (2017) point out, this presumably results in a wide disparity in the visibility of these two types of spending to voters at the district level. Grant- and loan-funded items such as transportation projects, education, police and fire protection are easily observable and consumed locally. In contrast, district level procurement spending often contributes to public goods that are less directly observable and offer diffuse benefits. Hence, this paper aims to contribute to the broader research body by shedding light on the features of spending politicians view as most useful in garnering votes. Does the electoral connection flow through the benefits of local public goods, or through the economic benefits of spending?[8] Documenting effects on district level earmark spending—as in Lazarus (2009)—or grant and loan spending tends to favor the former view, procurement the latter.

I define a vulnerable majority party representative as a legislator who (1) won his or her election to serve as a representative during a given Congress while receiving less than 60% of the two-party vote share and (2) is a member of the House majority party when that Congress begins. I then study differences in grant and loan spending and procurement spending between districts represented by these legislators and those where instead the majority party candidate experienced a close loss (*i.e.*, received a two-party vote share between 40% and 50%) over the two years leading up to the next election. To do so, I utilize district level federal grant and loans expenditures data from the Federal Assistance Award Data System (FAADS) for 1984-2010, and the data set constructed in Johnson and Roer (2018) aggregating the universe of unclassified federal procurement contracts signed between 2007 and 2016 to the district level. I then match the spending data to corresponding data on House elections. These data are embedded into a regression discontinuity design, which is constructed to capture the discontinuity in district level spending when a district goes from barely being represented by a member of the minority party

[8] Roer (2016).

to barely being represented by a member of the majority party. By controlling for differences in party preferences over spending, the specification identifies the causal effect of being a vulnerable member of the House majority on own-district spending—assuming the two sets of close elections are comparable aside from the outcome of the election itself. Because districts where close elections take place are precisely the places we would expect to have the greatest number of swing voters, this approach hence provides a means to test the Lindbeck and Weibull (1987) and Dixit and Londregan (1996) model.

I find that vulnerable majority party representatives do not receive greater grant or loan spending, which supports the argument given in Lee (2003). Estimated effects are nearly zero in magnitude and fairly precisely estimated, particularly in the preferred specification that uses log spending as the dependent variable. On the other hand, I find that the currently available procurement data are largely uninformative. Using the sample of elections where the two-party vote share lies between 40% and 60%, the estimated effects on both the level of real, per-capita spending and log spending are not statistically different from zero. However, the estimates are imprecise. While estimated effects are never significantly different from zero under any specification, bandwidth, or choice of kernel, it is difficult to draw conclusions based on these findings due to the amount of noise accompanying the estimates. This is likely a consequence of the relatively short time dimension in the sample. I am constrained by the availability of comprehensive procurement contract data, which do not exist prior to 2007. Nonetheless, there is empirical support for the identifying assumption mentioned above, validating the general statistical approach taken. The sets of districts experiencing close wins and closes are, on average, similar across pretreatment covariates and there does not appear to be any strategic sorting at the plurality threshold of 50%. This topic should be revisited as additional procurement data become available.

This paper primarily contributes to the expansive literature on distributive politics. Specifically, a number of papers have sought to empirically test the competing predictions put forth in Lindbeck and Weibull (1987) and Dixit and Londregan (1996) on the one hand, and in Cox and

McCubbins (1986) on the other. Golden and Picci (2008) find that when possible, individual legislators target spending at their bases. This seems to support the Cox and McCubbins (1986) hypothesis, though the authors note it is important to draw a distinction between parties and individual legislators when testing these models. Several studies outside the U.S. examine the allocation of intergovernmental grants and conclude that observed behavior is consistent with the swing voter theory.[9] Within the U.S., however, Lazarus (2009) notes that very few studies have documented a link between electoral vulnerability and spending, and those that have find at most a tenuous link between the two.[10] He argues that this is because the connection is restricted to members of the majority, due to the institutional advantages inherent to being in the majority in the U.S. As mentioned above, he finds this relationship does exist for earmark spending within members of the majority party in the House. This study contributes to the literature by (1) making methodological improvements in testing for the relationship between vulnerability and spending, and (2) by expanding the set of spending considered in an effort to determine the features of spending that provide the greatest electoral benefit. Regarding the latter point, this paper builds on Roer and Sandholtz (2017), who find that reductions in district level procurement spending stemming from the 2013 federal sequester do not affect overall incumbent outcomes in 2014 House elections—though reduced spending does make more senior representatives less likely to run for reelection.

In a more general sense, this paper also connects to the retrospective voting literature. This line of work examines how citizens evaluate government performance and how this translates to voting behavior.[11] Reelection-minded politicians who understand this correspondence have an incentive to maximize the expected future electoral returns of current spending, and this has manifested itself in various ways.[12] Martin (2003) shows that within congressional districts,

[9]Bracco et al. (2015); Dahlberg and Johansson (2002); Johansson (2003).

[10]Stein and Bickers (1994); Balla et al. (2002); Lee (2003).

[11]Berry and Howell (2007); Healy and Malhotra (2013).

[12]Manacorda, Miguel and Vigorito (2011), for instance, find that Uruguayan households benefitting from a large anti-poverty cash transfer program are significantly more likely to favor the current government relative to the prior administration.

areas with higher voting rates receive greater federal grant spending. Strömberg (2004) finds that counties with more informed voters, as measured by the number of radio listeners, received more New Deal relief spending. Lastly, Keefer and Khemani (2009) analyze the constituency development fund (CDF) in India and show that legislator effort is significantly lower in places where party attachment is higher. My work adds to this literature through investigating the types of *spending* that are viewed as having higher electoral returns, as opposed to which *populations* have higher returns.

The remainder of the paper proceeds as follows. Section 3.2 describes the data used in this project and presents descriptive statistics. Section 3.3 details my empirical approach and discusses threats to identification. Section 3.4 discusses the empirical findings; finally, section 3.5 concludes.

3.2 Data

I obtain House elections data for the 98th through 112th Congresses from Fowler and Hall (2017), who in turn use an expanded version of the data set compiled by Ansolabehere and Synder Jr. (2002). I compile the corresponding data for the 113th and 114th Congresses using information from the Federal Election Commission (FEC). Figure 3.1 plots control of the House of Representatives over my sample period. Grant and loan expenditures data spanning fiscal years 1984 through 2010 (*i.e.*, the 98th through 111th Congresses) come from the Federal Assistance Award Data System (FAADS), as used in Berry and Fowler (2016). I thank these authors for making these data publicly available. FAADS includes outlays from essentially all federal programs save for procurement. Formula grants and entitlements are excluded from the analysis,[13] since these spending categories are to a large extent protected from pork-barrel politics. The remaining spending is therefore non-formula grants and loans, of which the lion's share is grant spending. U.S. federal contract data come via the U.S. government's public-access

[13]Formally, FAADS assistance types 3 and 10 are excluded.

spending database USASpending.gov. USASpending.gov contains the universe of approximately 46 million unclassified federal contract actions over $3,000 signed since 2007. Johnson and Roer (2018) map contracts to the congressional district the vendor reports as the location of predominant contract performance; I use this same district level data set here. I conduct the analysis at the Congress level and hence the procurement data cover the 110th-114th Congresses.

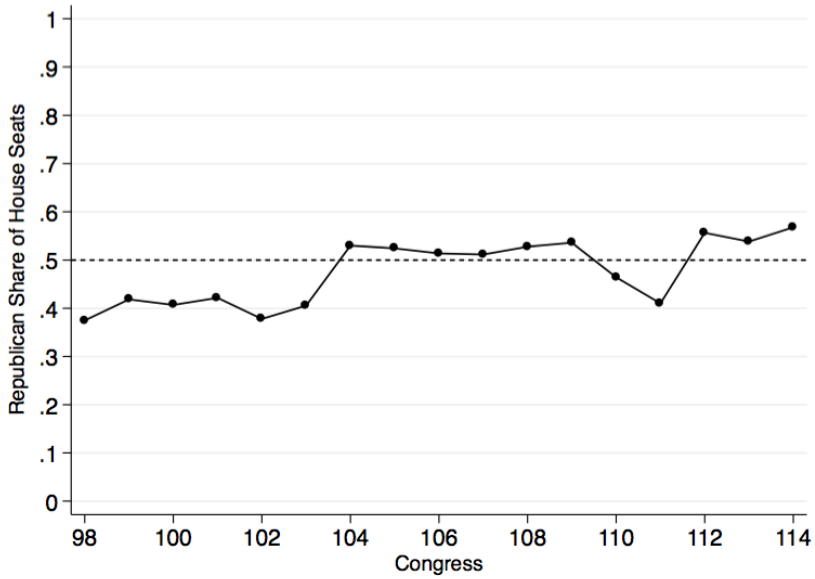


Figure 3.1: Control of the House of Representatives by Congress

Notes: Figure plots the number of seats held by Republicans divided by the sum of Republican and Democratic seats at the beginning of each Congress.

I move from annual to Congress level data for two reasons. First, doing so better align the data with the timing of congressional elections, which typically occur during the November prior to the start of a new Congress. This reduces measurement error in the key independent variables. Second, this is the more relevant time frame for the research question at hand. I aim to study how spending responds to a close win by a member of the majority party during the years leading up to the subsequent election, which corresponds to a two-year Congressional term. I sum contract spending within each two-year Congress in order to collapse to the Congress level.

Computing real, per-capita spending figures entails utilizing district level population

figures and a measure of the price level. I obtain annual state population data from the U.S. Census Bureau State Intercensal Tables and State Population Estimates. I identify the number of congressional districts in each state, each year using the U.S. Census Bureau Apportionment Tables. Federal law requires states to draw congressional district boundaries to ensure approximately equal population for all districts within a state. Therefore, I divide state population by the number of apportioned representatives to estimate annual congressional district populations. I calculate district population at the Congress level by computing the average district population over a congressional term. Finally, I deflate spending using the Consumer Price Index for All Urban Consumers (CPIU), taken from the U.S. Bureau of Labor Statistics.

FAADS summary statistics are shown in table 3.1. The means and standard deviations of FAADS spending in districts experiencing a close election are broadly consistent with the corresponding figures for the sample of all congressional districts. Means and standard deviations are comparable across districts experiencing close wins and losses as well. Procurement summary statistics are presented in table 3.2 and display a similar pattern. The means and standard deviations of real, per-capita procurement spending in districts that experience a close election are broadly similar to those for the entire sample of districts; this is true across the range of bandwidths defining the close elections I consider. Mean spending rises slightly as the bandwidth gets narrower and the variability of spending tends to be higher in districts that experienced a close loss than in districts where a close win occurred. Beyond the spending statistics reported in table 3.2, my analysis will rely on districts where close wins and losses occurred being, on average, similar with respect to predetermined variables. Further discussion of this point, including justification that these criteria hold in the present sample, is reserved for section 3.3.2.

Table 3.1: FAADS Summary Statistics

Sample	Mean	Std. Dev.	N
All Districts	2141.01	1763.91	6090
$[.40, .60]$ Close Win	1861.03	1363.49	738
$[.40, .60]$ Close Loss	2092.67	1614.27	710
$[.45, .55]$ Close Win	1927.29	1389.99	365
$[.45, .55]$ Close Loss	2021.48	1369.35	333
$[.48, .52]$ Close Win	2151.85	1610.27	137
$[.48, .52]$ Close Loss	1981.83	1474.56	144

Notes: Averages are computed across two-year Congresses and congressional districts. All values are real, per-capita spending. Ranges denote values of majority party vote share.

Table 3.2: Procurement Summary Statistics

Sample	Mean	Std. Dev.	N
All Districts	489.71	790.82	2183
$[.40, .60]$ Close Win	446.98	499.97	315
$[.40, .60]$ Close Loss	509.48	672.59	331
$[.45, .55]$ Close Win	481.98	507.36	143
$[.45, .55]$ Close Loss	506.56	586.61	156
$[.48, .52]$ Close Win	525.15	430.38	60
$[.48, .52]$ Close Loss	541.21	687.97	68

Notes: Averages are computed across two-year Congresses and congressional districts. All values are real, per-capita spending. Ranges denote values of majority party vote share.

3.3 Empirical Framework

3.3.1 Specification

Broadly, my goal is to empirically study how the majority party in the House distributes spending. Are funds directed towards core supporters? Or, are funds instead directed towards marginal voters in an effort to preserve the majority? In an ideal world, researchers could answer that question as follows. First, following congressional elections for Congress t, randomly assign each representative in each district majority or minority party status. Second, split the sample into a group of districts where the majority party candidate won with a vote share less than 60% and a group where the majority party candidate won with a vote share exceeding 60%. The first group is thus comprised of vulnerable legislators, while the second is composed of relatively safe legislators who experienced a comfortable victory. We could then run separate ordinary least squares (OLS) regressions on each sample, where district level spending during Congress t would serve as the dependent variable and an indicator for majority status as the independent variable. Randomizing in the manner described above would ensure that (1) districts represented by the majority and minority parties in each sample were comparable and that (2) differences between Democratic and Republican party ideology would not confound the results. Estimated coefficients across the two regressions would therefore allow us to infer the behavior of the majority party. If we found a significant effect in the sample of vulnerable legislators, this would support the swing voter theory; if we found a significant effect in the sample of safe legislators, this would support the hypothesis that the majority party targets spending at core supporters.

In practice, of course, researchers cannot randomly assign majority party status to House representatives. However, I can replicate this idealized experiment for the sample of vulnerable legislators using observational data. To do so, I employ a regression discontinuity design. If the outcome of close elections is sufficiently random, the set of elections in which the majority party candidate just won should be similar in every respect to the set of elections in which the majority

candidate just lost, save for the outcome of the election itself.[14] Hence, comparing spending outcomes across districts experiencing close majority wins and losses can provide a means to empirically test the swing voter theory. Unlike the conceptual exercise described above, however, I will need to control for party differences in spending preferences. This owes to the fact that, in actuality, the majority party does not randomly consist of both Democrats and Republicans, but rather solely contains members from one of the two parties. Given the differences between grant and loan spending and procurement spending described in section 3.1, by comparing results across spending categories, we can also learn about what *type* of federal spending politicians view as being most effective in maximizing votes. There has been relatively little empirical evidence on this in the literature to date.

Formally, I estimate

$$\begin{aligned} Spending_{i,t} = \alpha &+ \beta_1 1\{MajWins\}_{i,t} + \beta_2 MajVoteShare_{i,t} \\ &+ \beta_3 1\{MajWins\}_{i,t} \times MajVoteShare_{i,t} \\ &+ Spending_{i,t-1} + \delta_t + Democrat_{i,t} + \varepsilon_{i,t}, \end{aligned} \tag{3.1}$$

where $Spending_{i,t}$ is either real, per-capita or the log of real, per-capita FAADS or procurement spending in district i during Congress t. The $1\{MajWins\}_{i,t}$ variable takes a value of one if the majority party candidate won the election to become district i's representative during Congress t and zero otherwise. $MajVoteShare_{i,t}$ denotes the "centered" two-party vote share (*i.e.*, two-party vote share minus one-half) received by the majority party candidate in the election to become district i's representative during Congress t. $MajVoteShare$ thus represents the distance from the plurality threshold. The majority party is defined as the party with the majority of House seats at the beginning of Congress t, since my goal is to study the behavior of the majority party in Congress t leading up to elections for Congress $t+1$. I include lagged spending to capture persistence in spending and time fixed effects, δ_t, to control for idiosyncratic differences across

[14] Note that we would not expect this to be true for the set of elections in which the majority party candidate won or lost by a wide margin. Hence, this strategy does not provide a means to test the core supporter theory in practice.

Congresses. Lastly, $Democrat_{i,t}$ equals one if district i was represented by a Democrat during Congress t and zero otherwise. This variable is included to control for differences in spending preferences across Democrats and Republicans separate from the effect of being a member of the majority party.

I follow Imbens and Lemieux (2008) in estimating the regression discontinuity model using local linear regressions on observations close to the discontinuity point, allowing for different slopes on either side of the discontinuity. In my primary specification, I define a close election as one in which the two-party vote share was within 10 percentage points of the plurality threshold and utilize a rectangular kernel, which equally weights all observations within this bandwidth. The coefficient of interest is β_1, which captures the discontinuity in district level spending when a district goes from barely being represented by a member of the minority party to barely being represented by a member of the majority party. The identifying assumption is that elections in which a member of the majority party just won are, on average, similar to elections in which a member of the majority party just lost, aside from the outcome of the election itself. Another way of stating this assumption is that the outcome of close elections is random enough to be treated as exogenous.

3.3.2 Identification

The identifying assumption stated at the end of section 3.3.1 suggests two primary threats to identification. First, districts where the majority party candidate just won may be systematically different than districts where the majority party candidate just lost. Second, it may be possible to predict or manipulate the outcome of close elections. In either case, my estimates would be biased. In this section, I address each of these concerns in turn and present evidence that neither is a threat to the present analysis. I also provide further information on the sample of close elections used to estimate equation (3.1).

Figure 3.2 depicts the number of close elections in my sample according to three separate

bandwidths, broken down by Congress. The bandwidths correspond to House elections where the two-party vote share was within 10, five and two percentage points of the plurality threshold, respectively. As mentioned in the previous section, I principally define a close election as one falling within the 10 percentage point bandwidth; this maps to the highest line plotted in the figure. I thus primarily base my FAADS analysis on 1,448 close elections (covering the 98th through 111th Congresses) and my procurement analysis on 646 close elections (covering the 110th through 114th Congresses).

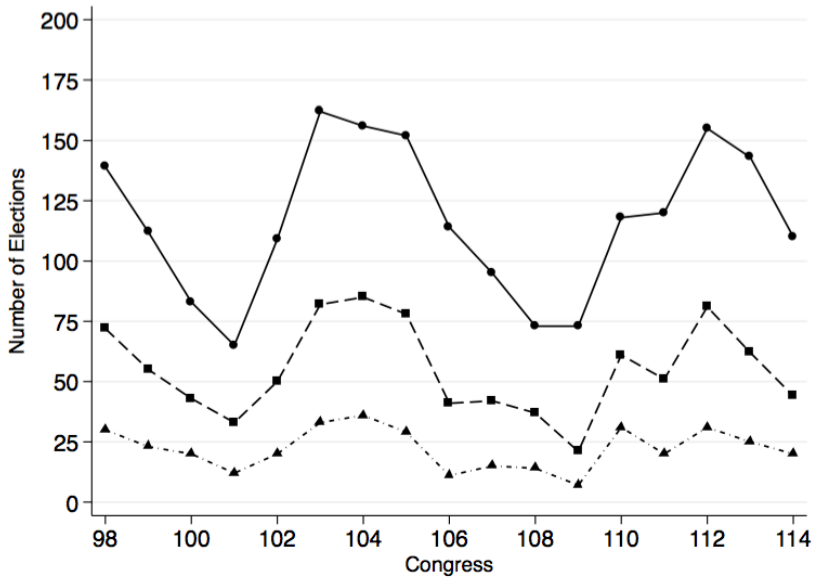


Figure 3.2: Close Elections by Congress

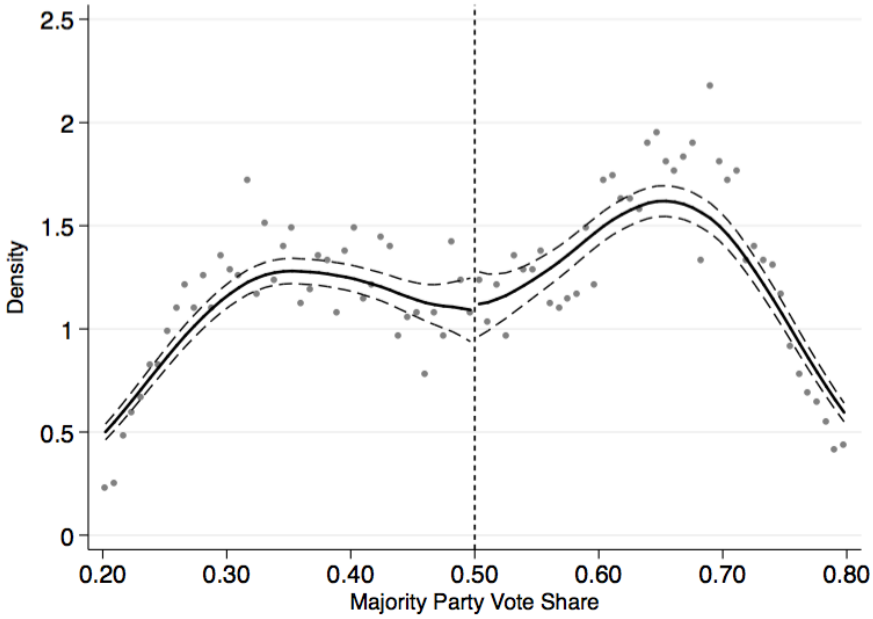
Notes: The solid line with circular markers denotes elections where the majority party candidate vote share fell within 10 percentage points of the plurality threshold. The dashed line with square markers corresponds to elections within five percentage points of the threshold. The combination dashed and dotted line with triangular markers corresponds to elections within two percentage points of the threshold.

Addressing the first concern listed above amounts to demonstrating that the sets of districts experiencing close wins and close losses in this sample are similar, on average, in all respects aside from the electoral outcome. To confirm similarity on pretreatment covariates, I rely on findings from previous research exploiting a similar identification strategy for different purposes. Lee, Moretti and Butler (2004), for example, show that differences between Democrat

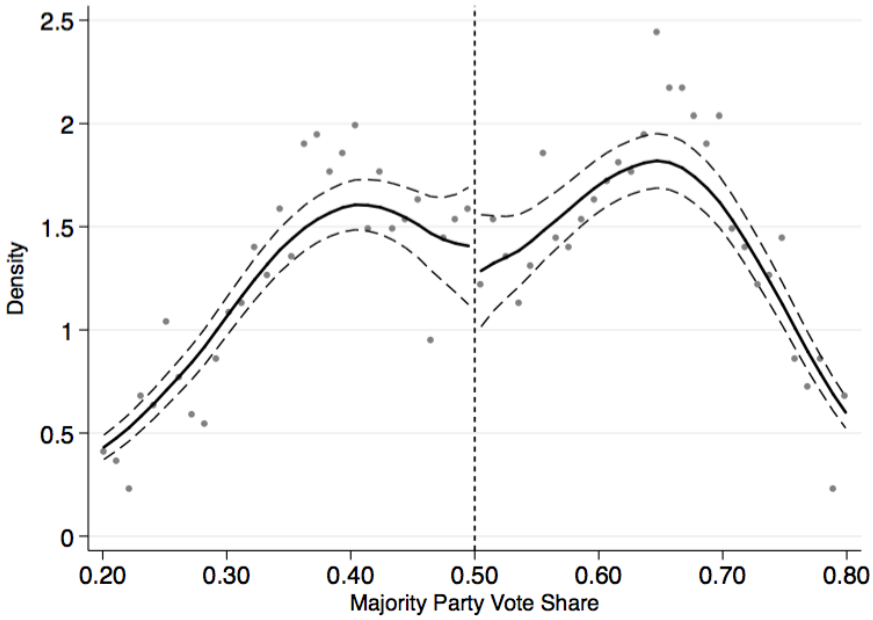
and Republican districts in: total population, geographical location, percent urban, percent black, percent eligible to vote, real income, percent manufacturing employment, educational attainment (as measured by the percentage of high school graduates) and the fraction of open seats are in general small and statistically insignificant among districts where close elections occurred, and become smaller as the elections become closer.

This comparability in district characteristics is reassuring, but leaves open the question of comparability in predetermined *political* variables at the district level. On this point, Lee (2008) demonstrates similarity in: Democrat political experience, opposition political experience, Democrat electoral experience and opposition electoral experience, as well as the Democratic vote share and win probability in the prior election. However, Caughey and Sekhon (2011) point out that close winners consistently hold *ex-ante* incumbency advantages over their competition and that the incumbent party's candidate tends to have an edge in both finances and experience. Partly for these reasons, these candidates are often the ones who were forecasted to win their elections; this brings us to the second threat to identification. The ability to forecast the results of close elections would violate the assumption that the outcome of close elections is sufficiently random. Furthermore, Snyder (2005) presents evidence suggesting that the vote counting process itself is biased towards incumbents, which would serve to compound this strategic sorting problem. Below, I conduct a number of robustness checks to allay concerns that this may confound the findings presented in this paper.[15]

[15]See also Eggers et al. (2015), who provide an empirical defense of vote share-based regression discontinuity designs across a variety of U.S. electoral settings, including the House of Representatives.



(a) FAADS Sample



(b) Procurement Sample

Figure 3.3: McCrary Tests

Notes: Density, fitted values and confidence intervals are based on McCrary (2008). The FAADS sample covers the 98th through 111th Congresses and the procurement sample covers the 110th through 114th Congresses.

First, I formally test for strategic sorting using the McCrary (2008) test for a discontinuity in the density of the running variable (vote share) at the plurality threshold. Figure 3.3 shows there is no such discontinuity in either the FAADS or procurement sample; majority and minority party candidates appear equally likely to win a close election. Second, my primary specification utilizes local linear regressions and a relatively wide bandwidth of 10 percentage points. This specification is less sensitive to strategic sorting around the threshold than regression discontinuity models employing higher order polynomial functions and narrow bandwidths, which more heavily weight elections just near the threshold. Lastly, and related to the previous point, my choice of a rectangular kernel implies that all observations within a given bandwidth are weighted equally. In the appendix, I present results using triangular weights, which upweight observations closer to the threshold. The results using each kernel are very similar and hence provide indirect evidence supporting the identifying assumption. Taken together, strategic sorting does not seem to pose a threat in this context.

3.4 Results

In this section, I present results from estimating equation (3.1). I include estimates for both real, per-capita FAADS and procurement spending and the log of real, per-capita spending. In each case, I estimate the empirical model with and without controls, and across three separate bandwidths. The coefficient of interest in the levels specifications captures the discontinuity in real, per-capita, district level spending when a district goes from barely being represented by a member of the minority party to barely being represented by a member of the majority party. Similarly, this coefficient in the logs specifications captures the percentage increase in real, per-capita, district level spending when a district goes from barely being represented by a member of the minority party to barely being represented by a member of the majority party.

Estimated effects on FAADS and procurement spending are reported in tables 3.3 and 3.4, respectively. Each model reported in each table uses a rectangular kernel; results using

triangular weights can be found in tables C.1 and C.2 in the appendix. I choose to focus on the specifications that include the controls listed in section 3.3.1 and use log spending as the dependent variable, as using log spending mitigates the influence of outliers. These specifications correspond to the even numbered columns in panel B of each table.

Table 3.3: FAADS Spending Results

	(1)	(2)	(3)	(4)	(5)	(6)
	Panel A: Levels					
MajWins	151.367	76.199	275.493	160.297	9.318	-99.329
	(157.878)	(97.668)	(207.195)	(116.681)	(359.091)	(212.139)
DV Mean	1974.609	2081.798	1972.224	2084.849	2064.726	2163.370
R^2	0.011	0.670	0.008	0.736	0.010	0.723
	Panel B: Logs					
MajWins	0.054	0.009	0.151	0.048	0.055	-0.005
	(0.073)	(0.031)	(0.104)	(0.043)	(0.167)	(0.064)
DV Mean	7.354	7.436	7.360	7.446	7.387	7.463
R^2	0.008	0.819	0.010	0.832	0.011	0.868
Range	[.40, .60]		[.45, .55]		[.48, .52]	
Controls	No	Yes	No	Yes	No	Yes
N Elections	1448	1297	698	622	281	250

Notes: Standard errors in parentheses. All regressions use rectangular weights. Range denotes values of two-party majority party vote share.

Column (2) in panel B of table 3.3 reports the estimated coefficient of interest for the FAADS sample using the preferred bandwidth of 10 percentage points. The point estimate of 0.009 indicates that vulnerable majority party representatives do not receive greater FAADS spending during the Congress immediately following a close victory. This null result is fairly precisely estimated and holds across each bandwidth considered, though estimates become somewhat less precise as the bandwidth narrows. This finding seems to support the reasoning in

Lee (2003), who finds that House members did influence the allocation of *earmarks* associated with the 1998 reauthorization of surface transportation programs, but not *overall* program funds. She argues that the geographic structure of the House of Representatives implies that representatives cannot convincingly claim credit for non-earmark grant spending, which accounts for the bulk of total grant expenditures. Congressional districts are electoral objects—not governmental or administrative units, like states. Therefore, House districts cannot serve as *direct* recipients of federal grant dollars. This diminishes the ability of representatives to claim credit for district level increases in most grant spending. Earmarks stand as the exception, since the location of earmarked projects is included in a given legislative bill. Thus, it does not seem to be the case that legislators view the act of providing local public goods as being electorally beneficial, on its own. It also matters that the representative is able to claim credit for providing these goods. Figures 3.4 and 3.5 provide a visual interpretation of the FAADS spending estimates using the 10 percentage point bandwidth without and with controls, respectively. Analogous plots employing triangular-weighted regressions may be found in figures C.1 and C.2 in the appendix.

I now turn to the procurement results and begin with the estimated effects on log spending. At a bandwidth of 10 percentage points, the estimated coefficient on $MajWins$ is -0.049—implying vulnerable majority party representatives receive 4.9% less procurement spending during the two years following a close victory—though not statistically different from zero. As the bandwidth narrows, point estimates grow in magnitude, though estimates become considerably less precise as I restrict the sample to closer elections and are never significantly different from zero. Moving from the 10 percentage point bandwidth to the five percentage point bandwidth results in a sample less than half the size; the same is true when moving from the five percentage point bandwidth to elections where the two-party majority party vote share was between 48 and 52 percent. The overarching takeaway is the same for the corresponding levels regressions. These estimates are reported in the even numbered columns in panel A of the table. The coefficient on $MajWins$ is never statistically different from zero, though point estimates rise

in magnitude as the bandwidth shrinks.

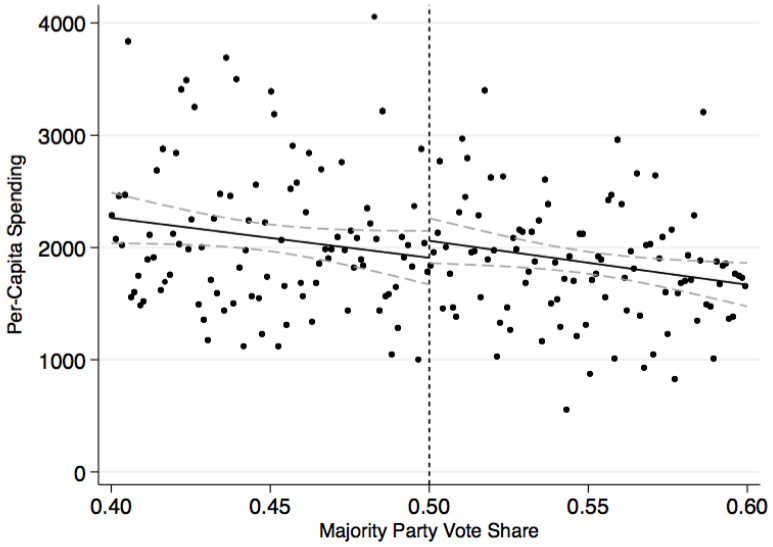
Table 3.4: Procurement Spending Results

	(1)	(2)	(3)	(4)	(5)	(6)
	Panel A: Levels					
MajWins	-18.034	9.656	-87.473	-13.729	-109.752	-151.021
	(95.635)	(47.463)	(124.275)	(69.178)	(205.175)	(118.198)
DV Mean	479.005	442.015	494.803	463.190	533.686	502.313
R^2	0.005	0.777	0.010	0.796	0.005	0.797
	Panel B: Logs					
MajWins	-0.004	-0.049	0.046	-0.125	0.066	-0.302
	(0.161)	(0.087)	(0.226)	(0.124)	(0.326)	(0.199)
DV Mean	5.666	5.603	5.722	5.637	5.859	5.780
R^2	0.008	0.797	0.013	0.809	0.009	0.788
Range	[.40, .60]		[.45, .55]		[.48, .52]	
Controls	No	Yes	No	Yes	No	Yes
N Elections	646	522	299	235	128	96

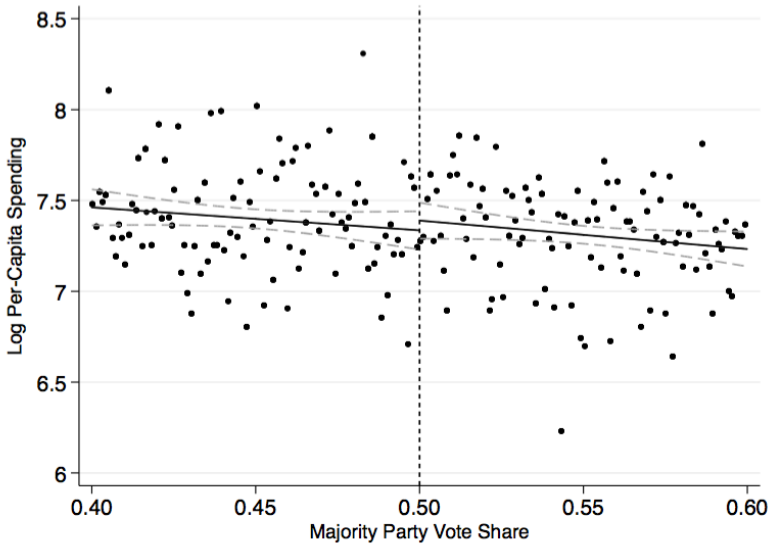
Notes: Standard errors in parentheses. All regressions use rectangular weights. Range denotes values of two-party majority party vote share.

Figures 3.6 and 3.7 visually confirm the statistical evidence provided in table 3.4: there is no apparent effect of a close win by a candidate from the majority party on district level procurement spending over the following Congress, but the estimates are noisy. Panel (a) of figure 3.6 plots real, per-capita district level procurement spending against the majority candidate's two-party vote share and panel (b) does the same for log spending. The two panels in figure 3.7 plot the residualized counterparts of spending and log spending, respectively, so that this figure corresponds to the regression models including controls. Across both figures, there is no detectable discontinuity at the 50% plurality threshold, but the variance accompanying the estimates is readily observable. Figures C.3 and C.4 in the appendix present analogous plots for

triangular-weighted regressions and support a similar conclusion.



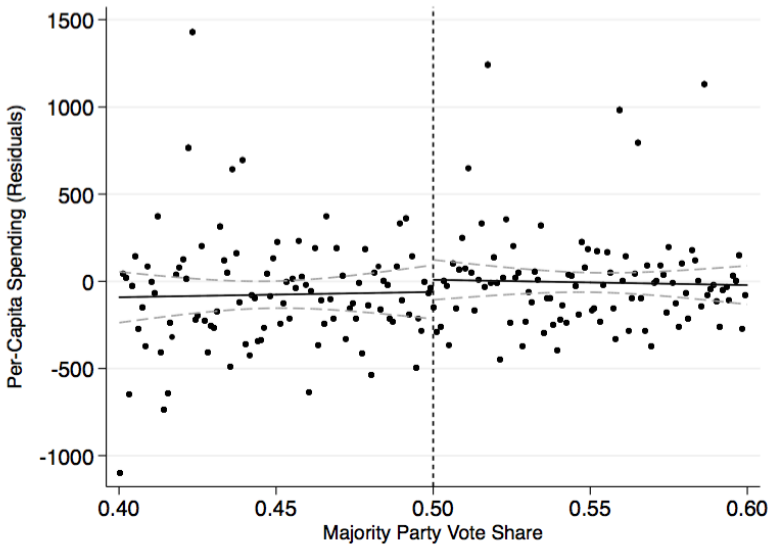
(a) Levels



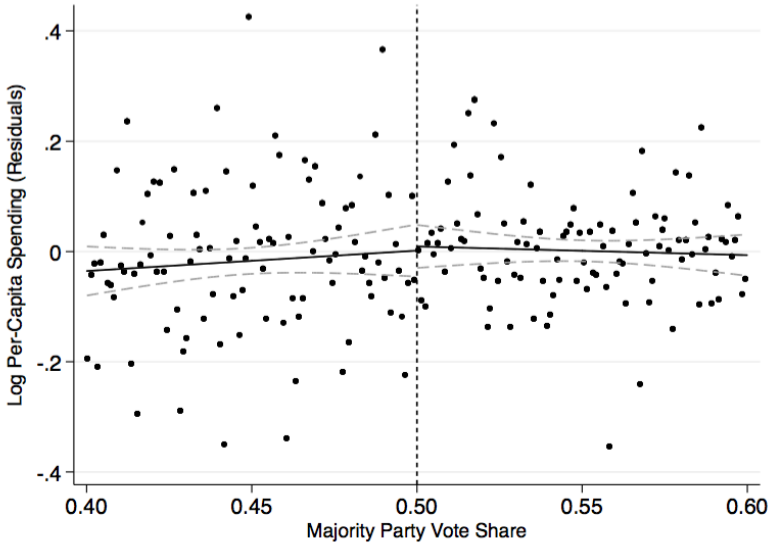
(b) Logs

Figure 3.4: FAADS Spending Results (No Controls)

Notes: The *x*-axis denotes the two-party majority candidate vote share. In panel (a), *y*-axis values represent average real, per-capita FAADS spending within a given vote share bin. In panel (b), *y*-axis values represent the average of the log of real, per-capita FAADS spending within a given bin. I use a bin width of 0.1 percentage points. Solid lines are estimated via ordinary least squares using rectangular weights. Dashed lines represent 95% confidence intervals.



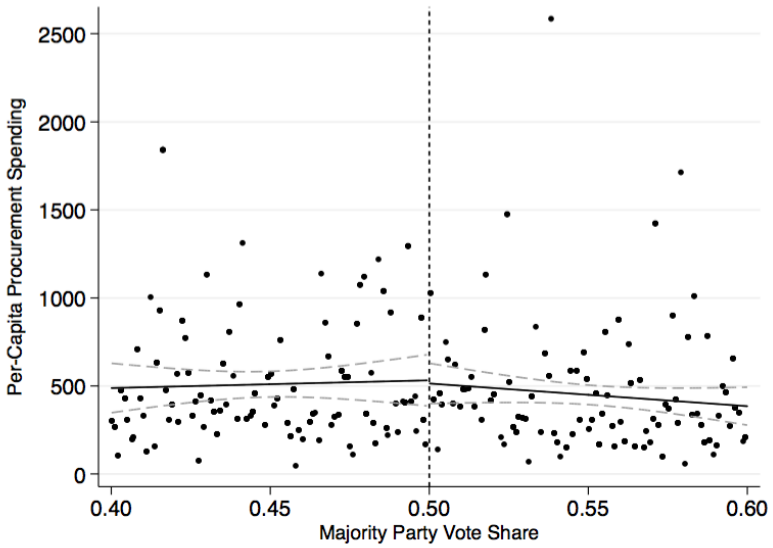
(a) Levels



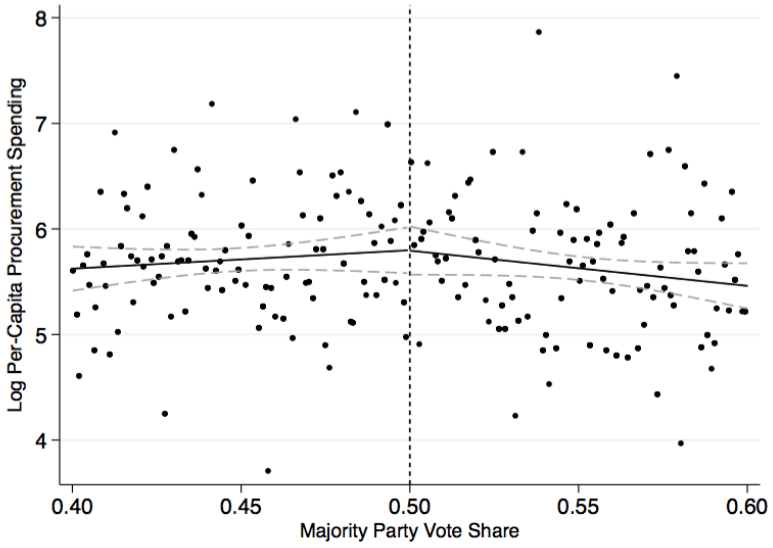
(b) Logs

Figure 3.5: FAADS Spending Results (With Controls)

Notes: The *x*-axis denotes the two-party majority candidate vote share. In panel (a), *y*-axis values represent average residuals of real, per-capita FAADS spending within a given vote share bin. In panel (b), *y*-axis values represent the average residuals of the log of real, per-capita FAADS spending within a given bin. Residuals are taken from regressions of spending on the controls listed in equation (3.1). I use a bin width of 0.1 percentage points. Solid lines are estimated via ordinary least squares using rectangular weights. Dashed lines represent 95% confidence intervals.



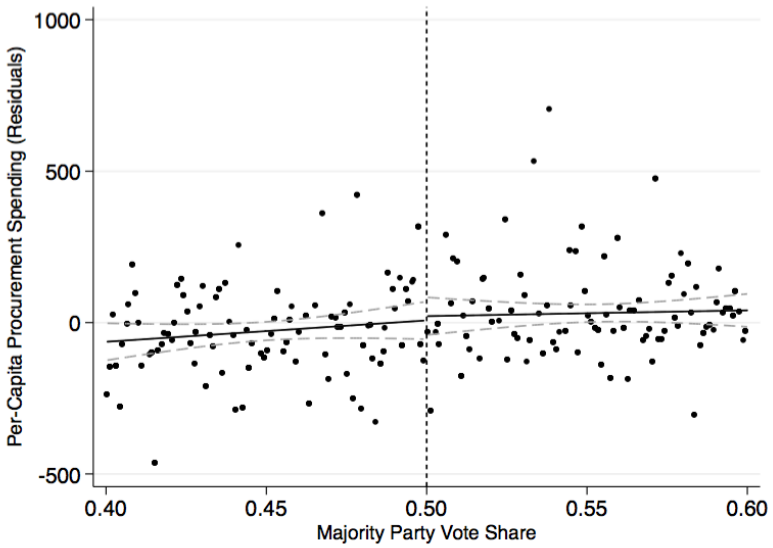
(a) Levels



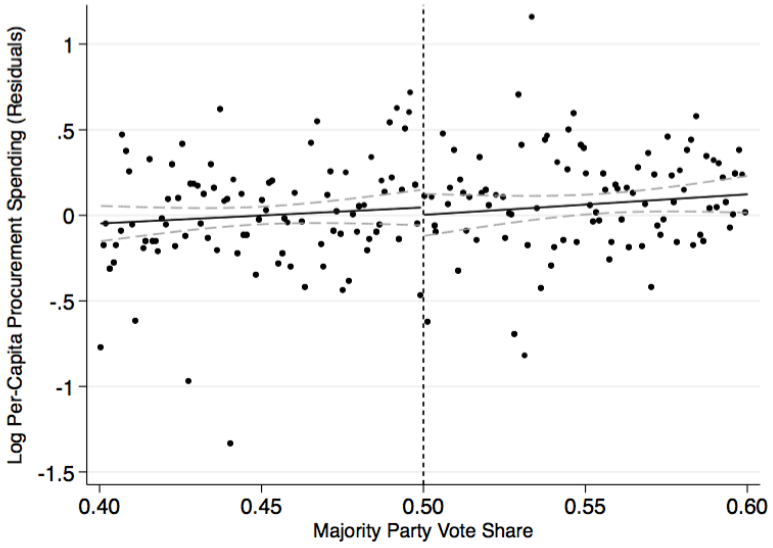
(b) Logs

Figure 3.6: Procurement Spending Results (No Controls)

Notes: The *x*-axis denotes the two-party majority candidate vote share. In panel (a), *y*-axis values represent average real, per-capita procurement spending within a given vote share bin. In panel (b), *y*-axis values represent the average of the log of real, per-capita procurement spending within a given bin. I use a bin width of 0.1 percentage points. Solid lines are estimated via ordinary least squares using rectangular weights. Dashed lines represent 95% confidence intervals.



(a) Levels



(b) Logs

Figure 3.7: Procurement Spending Results (With Controls)

Notes: The *x*-axis denotes the two-party majority candidate vote share. In panel (a), *y*-axis values represent average residuals of real, per-capita procurement spending within a given vote share bin. In panel (b), *y*-axis values represent the average residuals of the log of real, per-capita procurement spending within a given bin. Residuals are taken from regressions of spending on the controls listed in equation (3.1). I use a bin width of 0.1 percentage points. Solid lines are estimated via ordinary least squares using rectangular weights. Dashed lines represent 95% confidence intervals.

3.5 Conclusion

In this paper, I ask whether vulnerable majority party representatives receive greater spending over the two years following a close election and leading up to reelection. Furthermore, I separately estimate the effects of vulnerability on grant and loan spending and procurement spending in an effort to tease out the features of spending that are thought to provide the greatest electoral benefit. Grant and loan spending typically fund goods and services that are easily observable and consumed locally, while procurement spending often contributes to national level public goods that are less directly observable and offer diffuse benefits. Finding effects on the former set of spending would support the view that the electoral connection operates through the benefits of local public goods, while finding effects on the latter would support the notion that the connection works through the local economic benefits of spending itself. My analysis also provides a means to empirically test the Lindbeck and Weibull (1987) and Dixit and Londregan (1996) swing voter model on a wider set of spending than has been previously considered in the literature.

I construct a regression discontinuity model to capture the discontinuity in district level spending when a district goes from barely being represented by a member of the minority party to barely being represented by a member of the majority party. By controlling for differences in party preferences over spending, the specification identifies the causal effect of being a vulnerable member of the House majority on own-district spending. I find that vulnerable representatives do not receive greater grant and loan spending during the two years following a close victory. This finding supports the view put forth in Lee (2003), who argues that the structure of House representation lessens the scope for representatives to claim credit for increases in district level non-earmark grant expenditures. This rationale does not apply to earmarks—a small subset of overall grant spending—since the precise location of earmarked projects is included in the corresponding legislative bill. Both Lee (2003) and Lazarus (2009) find that earmark spending responds to vulnerability, suggesting that the ability to claim credit for local public good provision

matters over and above the provision of the good itself. The currently available procurement data, on the other hand, are largely uninformative. Estimated effects on procurement spending are never significantly different from zero, though the estimates are sufficiently noisy to preclude drawing firm conclusions. This topic should be revisited as additional procurement data become available.

Chapter 3, in full, is currently being prepared for submission for publication of the material. Johnson, Grant E. "Procuring Protection? Evidence from the U.S. House of Representatives." The dissertation author was the sole investigator and author of this material.

Appendix A

Procuring Pork: Contract Characteristics and Channels of Influence

A.1 Data Appendix

Both Senate and House subcommittee data are available online through the Government Publishing Office, https://www.gpo.gov/. Because Congressional negotiations in a given year result in appropriations legislation funding contracts the following year, we link contracts performed in each district each year to the legislator representing that district the previous year. Furthermore, in order to arbitrate situations in which there is not a single unique district representative due to events such as resignations and special elections, we assign legislators to committee positions they hold on April 1st of each year, since the legislative budgeting process starts in April.

In many cases, contract and subcommittee jurisdiction labels do not match *verbatim*. Therefore, we define three assignment variables based on our confidence in match accuracy. The lowest level accepts only *verbatim* matches, but does not map all contracts to a subcommittee. The highest level matches all contracts but likely contains incorrect matches. In our analysis, we use the intermediate level, which assigns contracts based on *verbatim* or close to *verbatim* matches. Our contract-to-Appropriations subcommittee crosswalk table is available upon request. Finally, we identify contracts as construction, real estate, or utilities based on six-digit NAICS codes, and we classify a construction contract as "MilCon" (Military Construction), if it is a construction contract issued by the Department of Defense with a value exceeding $1 million (the highest value for which financial regulations permit the use of Operations and Maintenance funds for construction).

We obtain annual state population data from U.S. Census Bureau 2000-2010 State Intercensal Tables and 2010-2016 State Population Estimates. We identify the number of congressional districts in each state each year using The U.S. Census Bureau Apportionment tables for 2000 and 2010. Federal law requires states to draw congressional district boundaries to ensure approximately equal population for all districts within a state. Therefore, we divide state population by the number of apportioned representatives to estimate annual congressional

district populations. We calculate district population at the Congress level by computing the average district population over a congressional term. We use the Missouri Census Data Center's MABLE Geographic Correspondence Engine to generate a crosswalk between 111th Congress and 113th Congress districts in order to determine whether congressional districts substantially change boundaries during post-2010 Census redistricting.

A.1.1 USASpending.gov Fields Used in Concentration Index

- "dollarsobligated": We exclude from the directability index contract actions obligating no funds or negative funds. We bin remaining contract actions according to their obligation value: $0 to $500,000 (the approximate Simplified Acquisition Threshold for non-commercial items), $500,001 to $5,000,000 (the approximate Simplified Acquisition Threshold for commercial items), and above $5,000,000.

- "modnumber": We exclude from the index contract modifications, keeping only actions with modification number equal to zero.

- "commercialitemacquisitionprocedures": We categorize contracts as *commercial* if commercial item acquisition procedures are used (response "A:"), and *non-commercial* otherwise.

- "nationalinterestactioncode": We use this field to proxy for whether a contract is associated with a regular annual appropriations bill, a supplemental bill funding overseas military operations, or a supplemental bill funding emergency response. We categorize a contract as funded by an overseas military operation if the nationalinterestactioncode field is O12F, O14F, O14S, or O15F, which cover operations in Iraq, Afghanistan, and Syria. Contract actions assigned any other code are categorized as supporting emergencies. The remaining contracts are categorized as funded by regular annual appropriations bills.

- "extentcompeted": We code a contract as sole-sourced if this field is assigned "B: Not available for Competition", "C: Not Competed", "E: Follow on to competed action", "G: Not competed under Simplified Acquisitions Procedures", "NDO: Non-Competitive Delivery Order". All other contracts are coded as Competed.

- "typeofsetaside": Among competed contracts, we use this field to distinguish between contracts competed using full and open competition from those competed among a subset

of firms that are certified by the Small Business Administration as being eligible to compete for various types of set-aside contracts (Small Business, Women-owned small business, Veteran-owned small business, etc.).

- "reasonnotcompeted": Among sole-sourced (non-competed) contracts, we use this field to distinguish the statutory justification for sole-sourcing, according to Federal Acquisitions Regulations (FAR) Subpart 6.3. The distinctions include: (1) sole-source set-asides for firms qualifying under the following sole-source programs: 8(a) Alaskan Native Owned Firms, Buy Indian program, HUBZONE program, Woman Owned Small Business program, and Disabled Veteran Owned Small Business Program; (2) Brand Name purchases ("BND"); (3) Follow on to competed actions ("FOC", "FOO", "NDO", and "STD" codings in USASpending.gov data; (4) Public Interest due to Mobilization and Essential Researcha nd Development, National Security, Public Interest, and Urgency justifications ("MES", "NS", "PI", "URG"); (5) only one source available, private data rights, unique source, unsolicited research proposal, and utilities ("ONE", "PDR", "UNQ", "UR", "UT"), (6) all other sole-sourced contracts.

A.1.2 U.S. House Appropriations Subcommittee Jurisdictions

We obtain U.S. House Appropriations subcommittee jurisdictions from each House Appropriations subcommittee webpage. These were retrieved in March 2017.

Table A.1: Appropriations Subcommittee Jurisdictions

Subcommittee	Listed Function
Agriculture	U.S. Department of Agriculture
	Except Forest Service
	Agricultural Credit Insurance Fund (USDA)
	Agricultural Marketing Service (USDA)
	Agricultural Research Service (USDA)
	Buildings and Facilities (USDA)
	Agriculture Buildings and Facilities (USDA)
	Animal and Plant Health Inspection Service (USDA)
	Buildings and Facilities (USDA)
	Child Nutrition Programs (USDA)
	Commodity Assistance Program (USDA)
	Commodity Credit Corporation (USDA)
	Conservation Operations (USDA)
	Dairy Indemnity Program (USDA)
	Departmental Administration (USDA)
	Distance Learning and Telemedicine Program (USDA)
	Economic Research Service (USDA)
	Emergency Conservation Program (USDA)
	Emergency Forest Restoration Program (USDA)
	Emergency Watershed Protection Program (USDA)
	Export Loans Program (USDA)
	Farm Credit Administration
	Farm Labor Housing Program (USDA)
	Farm Service Agency (USDA)
	Federal Crop Insurance Corporation (USDA)
	Food and Drug Administration (HHS)
	Food and Drug Administration Buildings and Facilities (HHS)
	Food and Nutrition Service (USDA)
	Food Safety and Inspection Service (USDA)
	Foreign Agricultural Service (USDA)
	Funds for Strengthening Markets, Income, and Supply (section 32) (USDA)
	Grain Inspection, Packers, and Stockyards Administration (USDA)
	Grassroots Source Water Protection Program (USDA)
	Hazardous Materials Management (USDA)
	Inspection and Weighing Services (USDA)
	McGovern-Dole International Food for Education Program (USDA)
	Multi-Family Housing Revitalization Program (USDA)
	Mutual and Self-Help Housing Grants (USDA)
	National Agricultural Statistics Service (USDA)
	National Appeals Division (USDA)
	National Institute of Food and Agriculture [NIFA] (USDA)
	Native American Institutions Endowment Fund (USDA)
	Natural Resources Conservation Service (USDA)
	Nutrition Program Administration (USDA)
	Office of Advocacy and Outreach (USDA)
	Office of Budget and Program Analysis (USDA)
	Office of Civil Rights (USDA)
	Office of Communications (USDA)
	Office of Ethics (USDA)
	Office of Homeland Security and Emergency Coordination (USDA)
	Office of the Assistant Secretary for Administration (USDA)
	Office of the Assistant Secretary for Civil Rights (USDA)
	Office of the Assistant Secretary for Congressional Relations (USDA)
	Office of the Chief Economist (USDA)
	Office of the Chief Financial Officer (USDA)
	Office of the Chief Information Officer (USDA)
	Office of the General Counsel (USDA)
	Office of the Inspector General (USDA)

Table A.2: Appropriations Subcommittee Jurisdictions (Continued)

Subcommittee	Listed Function
Agriculture (Cont.)	Office of the Secretary (USDA)
	Office of the Under Secretary for Farm and Foreign Agricultural Services (USDA)
	Office of the Under Secretary for Food, Nutrition and Consumer Services (USDA)
	Office of the Under Secretary for Food Safety (USDA)
	Office of the Under Secretary for Marketing and Regulatory Programs (USDA)
	Office of the Under Secretary for Natural Resources and Environment (USDA)
	Office of the Under Secretary for Research, Education, and Economics (USDA)
	Office of the Under Secretary for Rural Development (USDA)
	Office of Tribal Relations (USDA)
	Outreach for Socially Disadvantaged Farmers (USDA)
	Public Law 480 Program (USDA)
	Rental Assistance Program (USDA)
	Risk Management Agency (USDA)
	Rural Business-Cooperative Service (USDA)
	Rural Community Advancement Program (USDA)
	Rural Cooperative Development Grants (USDA)
	Rural Development Loan Fund (USDA)
	Rural Development Salaries and Expenses (USDA)
	Rural Economic Development Loans (USDA)
	Rural Electrification and Telecommunications Loans Program (USDA)
	Rural Housing Assistance Grants (USDA)
	Rural Housing Insurance Fund (USDA)
	Rural Housing Service (USDA)
	Rural Utilities Service (USDA)
	Rural Water and Waste Disposal Program (USDA)
	Special Supplemental Nutrition Program for Women, Infants, and Children [WIC] (USDA)
	State Mediation Grants (USDA)
	Supplemental Nutrition Assistance Program (USDA)
	Watershed Rehabilitation Program (USDA)
Commerce	Department of Commerce
	Department of Justice
	Bureau of Alcohol, Tobacco, Firearms and Explosives (Justice)
	Bureau of Economic and Statistical Analysis (Commerce)
	Bureau of Prisons (Justice)
	Bureau of the Census (Commerce)
	Commission on Civil Rights
	Drug Enforcement Administration (Justice)
	Economic and Statistical Analysis (Commerce)
	Economic Development Administration (Commerce)
	Equal Employment Opportunity Commission
	Federal Bureau of Investigation (Justice)
	Federal Prison Industries Incorporated (Justice)
	Foreign Claims Settlement Commission (Justice)
	International Trade Administration (Commerce)
	U.S. Foreign and Commercial Service (Commerce)
	International Trade Commission
	Justice Assistance/Research Evaluation and Statistics (Justice)
	Juvenile Justice and Delinquency Prevention (Justice)
	Legal Services Corporation
	Marine Mammal Commission
	Minority Business Development Agency (Commerce)
	National Aeronautics and Space Administration
	National Institute of Corrections (Justice)
	National Institute of Standards and Technology (Commerce)
	National Oceanic and Atmospheric Administration (Commerce)
	National Science Foundation

Table A.3: Appropriations Subcommittee Jurisdictions (Continued)

Subcommittee	Listed Function
Commerce (Cont.)	National Technical Information Service (Commerce)
	National Telecommunications and Information Administration (Commerce)
	Office of Justice Programs (Justice)
	Office of Science and Technology Policy (Executive Office of the President)
	Office of the U.S. Trade Representative (Executive Office of the President)
	Patent and Trademark Office (Commerce)
	Public Telecommunications Facilities Fund (Commerce)
	State Justice Institute
	U.S. Attorneys (Justice)
	U.S. Marshal Service (Justice)
	U.S. Parole Commission (Justice)
Energy	Department of Energy (DOE)
	Advanced Research Projects Agency—Energy ARPA–E (DOE)
	Advanced Technology Vehicles Manufacturing Loans Program (DOE)
	Appalachian Regional Commission/Appalachian Development Highway System *(See also Transportation and Housing and Urban Development, and Related Agencies)*
	Bonneville Power Administration (DOE)
	Bureau of Reclamation (Interior)
	Central Utah Project Completion Account (Interior)
	Corps of Engineers—Civil
	Department of Defense—Civil:
	Department of the Army:
	See Corps of Engineers—Civil
	Defense Environmental Cleanup
	Defense Nuclear Facilities Safety Board
	Delta Regional Authority
	Denali Commission
	Electricity Delivery and Energy Reliability (DOE)
	Energy Efficiency and Renewable Energy (DOE)
	Energy Information Administration (DOE)
	Falcon and Amistad Operating and Maintenance Fund (DOE)
	Federal Energy Regulatory Commission (DOE)
	Fossil Energy Research and Development (DOE)
	Innovative Technology Loan Guarantee Program (DOE)
	National Nuclear Security Administration (DOE)
	Naval Petroleum and Oil Shale Reserves (DOE)
	Non-Defense Environmental Cleanup
	Northeast Home Heating Oil Reserve
	Northern Border Regional Commission
	Nuclear Energy (DOE)
	Nuclear Regulatory Commission
	Nuclear Waste Disposal
	Nuclear Waste Technical Review Board
	Office of Science (DOE)
	Office of the Assistant Secretary of the Army (Civil Works)
	Office of the Federal Coordinator for Alaska Natural Gas Transportation Projects
	Office of the Inspector General (DOE)
	Other Defense Activities
	Southeast Crescent Regional Commission
	Southeastern Power Administration (DOE)
	Southwestern Power Administration (DOE)
	Strategic Petroleum Reserve (DOE)
	Uranium Enrichment Decontamination and Decommissioning
Defense	Air Force, Department of the (DOD) *(See also Military Construction, Veterans Affairs, and Related Agencies)*

Table A.4: Appropriations Subcommittee Jurisdictions (Continued)

Subcommittee	Listed Function
Defense (Cont.)	Army, Department of the (DOD) *(See also Military Construction, Veterans Affairs, and Related Agencies)* Basic Allowance for Housing Central Intelligence Agency (Executive) Central Intelligence Agency Retirement and Disability System Fund Defense Advanced Research Projects Agency (DOD) Defense Agencies (DOD) *(See also Military Construction, Veterans Affairs, and Related Agencies)* Defense Finance and Accounting Service Defense Health Defense Intelligence Agency (DOD) Defense Investigative Service (DOD) Defense Logistics Agency (DOD) Defense Security and Cooperation Agency Department of Defense—Military *(See also Military Construction, Veterans Affairs, and Related Agencies)* Department of the Air Force Department of the Army Department of the Navy Marine Corps Office of the Secretary of Defense Environmental Restoration Facilities Sustainment Intelligence Community Missile Defense Agency (DOD) National Geospatial and Intelligence Agency (DOD) National Guard and Reserve Components (DOD) National Reconnaissance Office National Security Agency (DOD) Navy, Department of the (DOD) *(See also Military Construction, Veterans Affairs, and Related Agencies)* North Atlantic Treaty Organization [NATO]: Department of Defense Overseas Dependents Education (DOD) U.S. Court of Military Appeals (DOD) Uniformed Services University of the Health Services
Finance	Administrative Conference of the United States Administrative Office of the U.S. Courts (Judiciary) Alcohol and Tobacco Tax and Trade Bureau (Treasury) Allowances and Office Staff for Former Presidents (GSA) Bureau of the Public Debt (Treasury) Care of Supreme Court Building and Grounds (Architect of the Capitol) Christopher Columbus Fellowship Foundation Commodity Futures Trading Commission Community Development Financial Institutions Fund Program Account (Treasury) Compensation of the President (Executive Office of the President) Consumer Product Safety Commission Council of Economic Advisers (Executive Office of the President) Court Services and Offender Supervision Agency for the District of Columbia Courts of Appeals, District Courts, and Other Judicial Services (Judiciary) Disaster Loans Program (Small Business Administration) District of Columbia Courts District of Columbia Federal Funds District of Columbia Public Defender Service Election Assistance Commission Executive Office of the President Executive Residence at the White House (Executive Office of the President)

Table A.5: Appropriations Subcommittee Jurisdictions (Continued)

Subcommittee	Listed Function
Finance (Cont.)	Federal Buildings Fund (GSA)
	Federal Citizen Services Fund (GSA)
	Federal Communications Commission
	Federal Deposit Insurance Corporation, Office of Inspector General
	Federal Election Commission
	Federal Judicial Center (Judiciary)
	Federal Labor Relations Authority
	Federal Trade Commission
	Financial Crimes Enforcement Network (Treasury)
	Financial Management Service (Treasury)
	Funds Appropriated to the President (Executive Office of the President)
	General Services Administration (GSA)
	Government-wide Management Councils (Executive Office of the President)
	Harry S Truman Scholarship Foundation
	High Intensity Drug Trafficking Areas (ONDCP)
	Internal Revenue Service (Treasury)
	Judiciary
	Merit Systems Protection Board
	Morris K. Udall and Stewart L. Udall Foundation
	National Archives and Records Administration
	National Credit Union Administration:
	Central Liquidity Facility
	Community Development Revolving Loan Fund
	National Historical Publications and Records Commission (NARA)
	National Security Council and Homeland Security Council (Executive Office of the President)
	Office of Administration (Executive Office of the President)
	Office of Government Ethics
	Office of Management and Budget (Executive Office of the President)
	Office of National Drug Control Policy (ONDCP)
	Office of Personnel Management
	Office of Special Counsel
	Official Residence of the Vice President (Executive Office of the President)
	Partnership Fund for Program Integrity Innovation
	Postal Regulatory Commission
	President's Commission on White House Fellows (OPM)
	Privacy and Civil Liberties Oversight Board
	Public Buildings Service (GSA)
	Real Property Management and Disposal Activities (GSA)
	Recovery Accountability and Transparency Board
	Resident Tuition Support (DC)
	Securities and Exchange Commission
	Selective Service System
	Small Business Administration
	Special Assistance to the President (Executive Office of the President)
	Special Inspector General for the Troubled Asset Relief Program
	Supreme Court of the United States (Judiciary)
	The White House (Executive Office of the President)
	Treasury, Department of the
	Treasury Forfeiture Fund
	U.S. Court of Appeals for the Federal Circuit (Judiciary)
	U.S. Court of International Trade (Judiciary)
	U.S. Mint (Treasury)
	U.S. Sentencing Commission (Judiciary)
	Unanticipated Needs (Executive Office of the President)
	United States Postal Service:
	Office of Inspector General
	Payment to the Postal Service Fund

Table A.6: Appropriations Subcommittee Jurisdictions (Continued)

Subcommittee	Listed Function
Finance (Cont.)	United States Tax Court
	Vice Presidential Residence (DOD-Navy)
	White House Repair and Restoration (Executive Office of the President)
Military Construction	Air Force, Department of the (DOD) *(See also Defense)*
	American Battle Monuments Commission
	Armed Forces Retirement Home
	Army, Department of the (DOD) *(See also Defense)*
	Chemical Demilitarization Construction (DOD)
	Defense Base Closure Accounts (DOD)
	Department of Defense—Civil:
	Department of the Army:
	Cemeterial Expenses
	Department of Defense—Military (DOD): *(See also Defense)*
	Department of the Army
	Department of the Navy
	Department of the Air Force
	Defense Agencies
	Office of the Secretary of Defense
	Family Housing, Construction (DOD)
	Family Housing, Operation and Maintenance (DOD)
	Family Housing Improvement Fund (DOD)
	Homeowners Assistance Fund (DOD)
	North Atlantic Treaty Organization (NATO) Security Investment Program (DOD)
	Navy, Department of the (DOD) *(See also Defense)*
	U.S. Court of Appeals for Veterans Claims
	U.S. Special Operations Command (DOD) *(See also Defense)*
	Veterans Affairs, Department of
Foreign	American Institute in Taiwan
	Department of State:
	Buying Power Maintenance Account
	Capital Investment Fund
	Conflict Stabilization Operations
	Contributions to International Organizations
	Assessed Contributions, United Nations and Other Organizations
	Contributions for International Peacekeeping Activities
	Assessed Contributions, United Nations
	Democracy Fund
	Diplomatic and Consular Programs
	Economic Support Fund
	Educational and Cultural Exchange Programs
	Embassy Security, Construction, and Maintenance
	Emergencies in the Diplomatic and Consular Service
	Foreign Military Financing Program
	Global Health Programs:
	President's Emergency Plan for AIDS Relief [PEPFAR]
	International Military Education and Training
	International Narcotics Control and Law Enforcement
	International Organizations and Programs
	Voluntary Contributions, United Nations and Other Organizations
	Migration and Refugee Assistance
	Nonproliferation, Anti-terrorism, Demining and Related Programs
	Office of Inspector General
	Payment to the Foreign Service Retirement and Disability Fund
	Peacekeeping Operations
	Protection of Foreign Missions and Officials
	Repatriation Loans Program Account

Table A.7: Appropriations Subcommittee Jurisdictions (Continued)

Subcommittee	Listed Function
Foreign (Cont.)	Representation Allowances
	United States Emergency Refugee and Migration Assistance Fund
	Department of the Treasury:
	International Affairs Technical Assistance
	International Financial Institutions:
	African Development Bank
	African Development Fund
	Asian Development Bank
	Asian Development Fund
	Clean Technology Fund
	Enterprise for the Americas Multilateral Investment Fund
	European Bank for Reconstruction and Development
	Global Agriculture and Food Security Program
	Global Environment Facility
	Inter-American Development Bank
	Inter-American Investment Corporation
	International Bank for Reconstruction and Development
	International Development Association
	International Finance Corporation
	International Fund for Agricultural Development
	International Monetary Fund
	Multilateral Investment Fund
	Strategic Climate Fund
	Export-Import Bank of the United States
	Inter-American Foundation
	International Commissions:
	American Sections, International Commissions
	International Boundary and Water Commission, United States and Mexico
	International Fisheries Commissions
	Millennium Challenge Corporation
	Overseas Private Investment Corporation
	Peace Corps
	Related Agencies and Programs and Other Commissions:
	The Asia Foundation
	Broadcasting Board of Governors
	Center for Middle Eastern-Western Dialogue Trust Fund
	Commission for the Preservation of America's Heritage Abroad
	Commission on Security and Cooperation in Europe (Helsinki Commission)
	Congressional-Executive Commission on the People's Republic of China
	East-West Center
	Eisenhower Exchange Fellowship Program
	Israeli Arab Scholarship Program
	National Endowment for Democracy
	United States-China Economic and Security Review Commission
	United States Commission on International Religious Freedom
	United States Institute of Peace
	Trade and Development Agency
	United States African Development Foundation
	United States Agency for International Development:
	Capital Investment Fund
	Civilian Stabilization Initiative
	Complex Crises Fund
	Development Assistance
	Development Credit Authority
	Global Health Programs
	International Disaster Assistance
	Office of Inspector General
	Operating Expenses

Table A.8: Appropriations Subcommittee Jurisdictions (Continued)

Subcommittee	Listed Function
Foreign (Cont.)	Transition Initiatives
Homeland Security	Department of Homeland Security
	Analysis and Operations
	Biometric Identity Management, Office of [US-VISIT]
	Chief Financial Officer, Office of the
	Chief Information Officer, Office of the
	Disaster Assistance Direct Loan Program
	Disaster Relief
	Domestic Nuclear Detection Office
	Emergency Food and Shelter
	Emergency Management Performance Grants
	Federal Emergency Management Agency
	Federal Law Enforcement Training Center
	Federal Protective Service
	Firefighter Assistance Grants
	Flood Hazard Mapping
	Health Affairs, Office of
	Inspector General, Office of
	National Flood Insurance Fund
	National Protection and Programs Directorate
	Predisaster Mitigation Fund
	Science and Technology
	Secretary and Executive Management, Office of the
	State and Local Preparedness Grants
	Transportation Security Administration
	U.S. Citizenship and Immigration Services
	U.S. Coast Guard
	U.S. Customs and Border Protection
	U.S. Fire Administration
	U.S. Immigration and Customs Enforcement
	U.S. Secret Service
	Under Secretary for Management, Office of the
	Working Capital Fund
Interior	Department of the Interior
	Except the Bureau of Reclamation
	Advisory Council on Historic Preservation
	Agency for Toxic Substances and Disease Registry (HHS)
	Bureau of Indian Affairs (Interior)
	Bureau of Land Management (Interior)
	Bureau of Ocean Energy Management (Interior)
	Bureau of Safety and Environmental Enforcement (Interior)
	Chemical Safety and Hazard Investigation Board
	Commission on Fine Arts
	Council on Environmental Quality and Office of Environmental Quality (Executive Office of the President)
	Dwight D. Eisenhower Memorial Commission
	Environmental Protection Agency
	Historic Preservation Fund (Interior)
	Holocaust Memorial Museum
	Indian Health Service (HHS)
	Institute of American Indian and Alaska Native Culture and Arts Development
	Insular Affairs, Office of (Interior)
	John F. Kennedy Center for the Performing Arts
	Land and Water Conservation Fund
	National Capital Arts and Cultural Affairs
	National Capital Planning Commission

Table A.9: Appropriations Subcommittee Jurisdictions (Continued)

Subcommittee	Listed Function
Interior (Cont.)	National Endowment for the Arts
	National Endowment for the Humanities
	National Foundation on the Arts and the Humanities
	National Gallery of Art
	National Indian Gaming Commission
	National Institute of Environmental Health Sciences (NIH) *(See also Labor, Health and Human Services, and Education, and Related Agencies)*
	National Park Service (Interior)
	Office of Navajo and Hopi Indian Relocation
	Office of Special Trustee for American Indians (Interior)
	Office of Surface Mining Reclamation and Enforcement (Interior)
	Smithsonian Institution
	U.S. Fish and Wildlife Service (Interior)
	U.S. Forest Service (USDA)
	U.S. Geological Survey (Interior)
	Woodrow Wilson International Center for Scholars
Labor	Department of Labor
	Department of Health and Human Services (HHS)
	Except:
	Food and Drug Administration
	Indian Health and Construction Activities
	Department of Education
	Administration for Children and Families (HHS)
	Administration for Community Living (HHS)
	Adolescent Pregnancy (HHS)
	Agency for Healthcare Research and Quality (HHS)
	Aging Programs (HHS)
	American Printing House for the Blind (Education)
	AmeriCorps (Related Agency)
	Bilingual and Immigrant Education (Education)
	Biomedical Advanced Research and Development Authority (HHS)
	Black Lung Benefits (Labor)
	Bureau of International Labor Affairs (Labor)
	Bureau of Labor Statistics (Labor)
	Center for Consumer Information and Insurance Oversight (HHS)
	Centers for Disease Control and Prevention (HHS)
	Centers for Medicare and Medicaid Services (HHS)
	Child Abuse Prevention and Treatment (HHS)
	Child Care and Development Block Grant (HHS)
	Child Support Enforcement (HHS)
	Child Welfare Services (HHS)
	Children and Family Services Programs (HHS)
	College Housing and Academic Facilities Loans (Education)
	Committee for Purchase From People Who Are Blind or Severely Disabled (Related Agency)
	Community Health Centers (HHS)
	Community Service Employment for Older Americans (Labor)
	Community Services Block Grant (HHS)
	Consumer Price Index (Labor)
	Corporation for National and Community Service (Related Agency):
	AmeriCorps
	Domestic Volunteer Service Programs
	Corporation for Public Broadcasting (Related Agency)
	Developmental Disabilities (HHS)
	Dislocated Worker Assistance (Labor)
	Education for the Disadvantaged—Title I (Education)
	Employee Benefits Security Administration (Labor)

Table A.10: Appropriations Subcommittee Jurisdictions (Continued)

Subcommittee	Listed Function
Labor (Cont.)	Employment and Training Administration (Labor)
	English Language Acquisition (Education)
	Family Planning (HHS)
	Family Violence Prevention and Services (HHS)
	Federal Disability Insurance (SSA)
	Federal Mediation and Conciliation Service (Related Agency)
	Federal Mine Safety and Health Review Commission (Related Agency)
	Federal Old Age and Survivors Insurance (SSA)
	Federal Unemployment Benefits and Allowances (Labor)
	Foster Care/Adoption Assistance (HHS)
	Gallaudet University (Education)
	Global Health (HHS)
	Head Start (HHS)
	Health Professions Education (HHS)
	Health Resources and Services Administration (HHS)
	Health Services Research (HHS)
	Higher Education (Education)
	Howard University (Education)
	Impact Aid (Education)
	Indian Student Education (Education)
	Institute of Education Sciences (Education)
	Institute of Museum and Library Services (Related Agency):
	Office of Library Services
	Office of Museum Services
	International Education and Foreign Language Programs (Education)
	John E. Fogarty International Center for Advanced Study in the Health Sciences (NIH)
	Labor-Management Standards (Labor)
	Low-Income Home Energy Assistance Program (HHS)
	Maternal and Child Health Bureau (HHS)
	Medicaid/Medicare Contractors (HHS)
	Medicare Payment Advisory Commission (Related Agency)
	Migrant Education (Education)
	Migrant Health (HHS)
	Mine Health and Safety Academy (Labor)
	Mine Safety and Health Administration (Labor)
	National Cancer Institute (NIH)
	National Center for Advancing Translational Sciences (NIH)
	National Center for Complementary and Integrative Medicine (NIH)
	National Center for Health Statistics (HHS)
	National Council on Disability
	National Eye Institute (NIH)
	National Health Service Corps (HHS)
	National Heart, Lung, and Blood Institute (NIH)
	National Human Genome Research Institute (NIH)
	National Institute of Allergy and Infectious Diseases (NIH)
	National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIH)
	National Institute of Biomedical Imaging and Bioengineering (NIH)
	National Institute of Child Health and Human Development (NIH)
	National Institute of Dental and Craniofacial Research (NIH)
	National Institute of Diabetes and Digestive and Kidney Diseases (NIH)
	National Institute of Environmental Health Sciences (NIH) *(See also Interior, Environment, and Related Agencies)*
	National Institute of General Medical Sciences (NIH)
	National Institute of Mental Health (NIH)
	National Institute of Neurological Disorders and Stroke (NIH)
	National Institute of Nursing Research (NIH)
	National Institute on Aging (NIH)

Table A.11: Appropriations Subcommittee Jurisdictions (Continued)

Subcommittee	Listed Function
Labor (Cont.)	National Institute on Alcoholism and Alcohol Abuse (NIH)
	National Institute on Deafness and Other Communication Disorders (NIH)
	National Institute on Drug Abuse (NIH)
	National Institute on Minority Health and Health Disparities (NIH)
	National Institute on Occupational Safety and Health (HHS)
	National Institutes of Health (HHS)
	National Labor Relations Board (Related Agency)
	National Library of Medicine (NIH)
	National Mediation Board (Related Agency)
	National Technical Institute for the Deaf (Education)
	Native American Programs (HHS) (Education) (Labor)
	Nursing Workforce Development (HHS)
	Occupational Safety and Health Administration (Labor)
	Occupational Safety and Health Review Commission
	Office for Civil Rights (HHS) (Education)
	Office of Apprenticeship (Labor)
	Office of Disability Employment Policy (Labor)
	Office of Elementary and Secondary Education (Education)
	Office of Federal Contract Compliance Programs (Labor)
	Office of Job Corps (Labor)
	Office of Innovation and Improvement (Education)
	Office of Refugee Resettlement (HHS)
	Office of Special Education and Rehabilitative Services (Education)
	Office of Workers' Compensation Programs (Labor)
	Pell Grants (Education)
	Pension Benefit Guaranty Corporation (Labor)
	President's Council on Physical Fitness (HHS)
	Public Health Service (HHS)
	Railroad Retirement Board (Related Agency)
	Rehabilitation Services and Disability Research (Education)
	Runaway and Homeless Youth (HHS)
	Ryan White HIV/AIDS Care Act (HHS)
	Safe and Drug-Free Schools (Education)
	School Improvement Programs (Education)
	Section 317 Immunization Program (HHS)
	Sexually Transmitted Infections Program (HHS)
	Social Security Administration (Related Agency)
	Social Services Block Grant (HHS)
	Special Benefits for Disabled Coal Miners (Labor)
	Special Education (Education)
	State Unemployment Insurance and Employment Service Operations (Labor)
	Student Aid Administration (Education)
	Student Financial Assistance (Education)
	Substance Abuse and Mental Health Services Administration (HHS)
	Supplemental Security Income (SSA)
	Temporary Assistance for Needy Families (HHS)
	Trade Adjustment Assistance/Workers (Labor)
	Veterans Employment and Training (Labor)
	Vocational and Adult Education (Education)
	Wage and Hour Division (Labor)
	Woman's Bureau (Labor)
	Workforce Innovation and Opportunity Act One-Stop Centers (Labor)
Transportation	Department of Transportation
	Department of Housing and Urban Development
	Access Board
	Amtrak Office of Inspector General

Table A.12: Appropriations Subcommittee Jurisdictions (Continued)

Subcommittee	Listed Function
Transportation (Cont.)	Appalachian Regional Commission/Appalachian Development Highway System *(See also Energy and Water Development)*
	Community Planning and Development (HUD)
	Fair Housing and Equal Opportunity (HUD)
	Federal Aviation Administration (Transportation)
	Federal Highway Administration (Transportation)
	Federal Housing Administration (HUD)
	Federal Maritime Commission
	Federal Motor Carrier Safety Administration (Transportation)
	Federal Railroad Administration (Transportation)
	Federal Transit Administration (Transportation)
	Government National Mortgage Association (HUD)
	Lead Hazard Control and Healthy Homes (HUD)
	Maritime Administration (Transportation)
	National Highway Traffic Safety Administration (Transportation)
	National Railroad Passenger Corporation (Amtrak)
	National Transportation Safety Board
	Neighborhood Reinvestment Corporation
	Office of Housing (HUD)
	Office of the Secretary of Transportation (Transportation)
	Pipeline and Hazardous Materials Safety Administration (Transportation)
	Policy Development and Research (HUD)
	Public and Indian Housing (HUD)
	St. Lawrence Seaway Development Corporation (Transportation)
	Surface Transportation Board
	U.S. Interagency Council on Homelessness
	Washington Metropolitan Area Transit Authority
Legislative	Architect of the Capitol
	Books for the Blind and Physically Handicapped (Library of Congress)
	Botanic Garden (Architect of the Capitol)
	Capitol Police
	Congressional Budget Office
	Congressional Research Service (Library of Congress)
	Copyright Office (Library of Congress)
	Government Accountability Office
	Government Publishing Office
	House of Representatives
	John C. Stennis Center for Public Service, Training, and Development
	Joint Committee on Taxation
	Joint Congressional Committee on Inaugural Ceremonies
	Joint Economic Committee
	Library of Congress
	Office of Compliance
	Office of Congressional Accessibility Services
	Office of the Attending Physician
	Open World Leadership Center Trust Fund
	Senate

A.1.3 Contract Concentration Index Descriptive Statistics

Table A.13: Contract Concentration Index Summary Statistics

Variable	Mean	Std. Dev.	Min	Max
Cell Herfindahl Value	0.064	0.074	0.0039	0.38
Cell Size	237,656	1,262,319	12	9,587,132
Low Spending Bin (below $500,000)	0.41	0.49	0	1
High Spending Bin (above $5 million)	0.21	0.41	0	1
Competed	0.32	0.47	0	1
Commercial Item	0.50	0.50	0	1
Regular Annual Appropriation	0.46	0.50	0	1
Supplemental Appropriation for Overseas Military	0.26	0.44	0	1
N	101	101	101	101

Table A.14: Assessment of Contract Concentration Index

	(1) Cell Herfindahl	(2) Cell Herfindahl	(3) Cell Herfindahl
Cell Size	-6.68e-09***		
	(1.44e-09)		
Low Spending Bin (below $500,000)		-0.0524***	
		(0.0123)	
Competed		-0.0333***	
		(0.0117)	
Commercial Item		0.00899	-0.0000949
		(0.0122)	(0.0166)
Regular Annual Appropriation		-0.0763***	
		(0.0126)	
High Spending Bin (above $5 million)			0.00165
			(0.0194)
Commercial Item, High Spending Bin			0.0338
			(0.0376)
Constant	0.0652***	0.126***	0.06***
	(0.0076)	(0.0151)	(0.0102)
Adj. R-squared	0.0029	0.34	-0.01
N	101	101	101

Notes: Heteroskedasticity robust standard errors in parentheses. ***, ** and * indicate coefficients statistically different from zero at the 0.01, 0.05 and 0.10 levels, respectively.

A.1.4 Contract Concentration Index Cells

Table A.15: Contract Concentration Index Cells

Cell	No. Contracts	House Index Value	House Index 2-Quantile
Spending Low X Solesource Other X Commercial Item X Annual Appropriations	625,207	0.004	1
Spending Low X Competed Setaside X Commercial Item X Annual Appropriations	1,093,491	0.005	1
Spending Low X Solesource Brandname X Commercial Item X Annual Appropriations	4,969	0.006	1
Spending Low X Solesource Public Interest X Commercial Item X Annual Appropriations	84,189	0.007	1
Spending Low X Solesource Unique Source X Commercial Item X Annual Appropriations	680,828	0.008	1
Spending Medium X Solesource Other X Commercial Item X Annual Appropriations	12,593	0.008	1
Spending Low X Solesource Brandname X Non-Commercial Item X Annual Appropriations	918	0.008	1
Spending Low X Solesource Unique Source X Non-Commercial Item X Disaster Appropriations	758	0.008	1
Spending Low X Competed Full X Non-Commercial Item X Annual Appropriations	9,587,132	0.008	1
Spending Low X Competed Full X Commercial Item X Disaster Appropriations	3,856	0.008	1
Spending Low X Competed Setaside X Non-Commercial Item X Annual Appropriations	917,542	0.009	1
Spending Medium X Solesource Unique Source X Non-Commercial Item X Annual Appropriations	32,359	0.009	1
Spending Medium X Solesource Public Interest X Commercial Item X Annual Appropriations	1,037	0.010	1
Spending Low X Solesource Unique Source X Commercial Item X Disaster Appropriations	563	0.010	1
Spending Low X Solesource Setaside X Commercial Item X Annual Appropriations	69,450	0.010	1
Spending Medium X Solesource Unique Source X Commercial Item X Annual Appropriations	12,096	0.010	1
Spending Medium X Competed Setaside X Non-Commercial Item X Annual Appropriations	34,984	0.011	1
Spending Low X Solesource Public Interest X Non-Commercial Item X Annual Appropriations	84,634	0.011	1
Spending Low X Competed Full X Non-Commercial Item X Disaster Appropriations	5,107	0.012	1
Spending Medium X Competed Full X Commercial Item X Annual Appropriations	82,282	0.012	1
Spending Low X Competed Setaside X Commercial Item X Disaster Appropriations	1,423	0.012	1
Spending Low X Solesource Other X Non-Commercial Item X Disaster Appropriations	609	0.013	1
Spending Low X Solesource Other X Commercial Item X Disaster Appropriations	516	0.013	1
Spending Medium X Competed Full X Non-Commercial Item X Annual Appropriations	144,322	0.013	1
Spending High X Solesource Unique Source X Non-Commercial Item X Annual Appropriations	7,244	0.014	1
Spending High X Competed Full X Non-Commercial Item X Annual Appropriations	18,324	0.014	1
Spending Low X Competed Setaside X Commercial Item X War Appropriations	207	0.015	1
Spending Medium X Solesource Other X Non-Commercial Item X Annual Appropriations	8,420	0.016	1
Spending High X Competed Full X Commercial Item X Annual Appropriations	9,580	0.016	1
Spending Medium X Competed Setaside X Commercial Item X Annual Appropriations	22,706	0.016	1
Spending High X Solesource Other X Non-Commercial Item X Annual Appropriations	1,142	0.017	1
Spending Medium X Solesource Follow-on X Non-Commercial Item X Annual Appropriations	3,196	0.017	1
Spending High X Solesource Follow-on X Non-Commercial Item X Annual Appropriations	590	0.018	1
Spending Low X Solesource Other X Commercial Item X War Appropriations	333	0.018	1
Spending High X Solesource Unique Source X Commercial Item X Annual Appropriations	1,519	0.019	1
Spending Medium X Competed Full X Commercial Item X Disaster Appropriations	134	0.020	1
Spending High X Competed Setaside X Non-Commercial Item X Annual Appropriations	2,427	0.020	1
Spending Low X Solesource Setaside X Non-Commercial Item X Annual Appropriations	66,806	0.020	1
Spending Low X Competed Full X Commercial Item X War Appropriations	4,094	0.021	1
Spending Medium X Solesource Brandname X Commercial Item X Annual Appropriations	86	0.021	1
Spending Medium X Solesource Setaside X Non-Commercial Item X Annual Appropriations	7,686	0.021	1
Spending Low X Competed Full X Non-Commercial Item X War Appropriations	7,697	0.022	1
Spending High X Solesource Other X Commercial Item X Annual Appropriations	1,751	0.023	1
Spending Low X Solesource Unique Source X Commercial Item X War Appropriations	285	0.023	1
Spending Low X Competed Full X Commercial Item X Annual Appropriations	8,256,262	0.023	1
Spending Medium X Competed Full X Non-Commercial Item X Disaster Appropriations	495	0.025	1
Spending Medium X Solesource Follow-on X Commercial Item X Annual Appropriations	763	0.025	1
Spending Low X Solesource Unique Source X Non-Commercial Item X Annual Appropriations	762,881	0.025	1
Spending Medium X Solesource Setaside X Commercial Item X Annual Appropriations	7,642	0.026	1
Spending High X Solesource Public Interest X Commercial Item X Annual Appropriations	164	0.028	1
Spending Medium X Solesource Public Interest X Non-Commercial Item X Annual Appropriations	5,586	0.028	1
Spending Low X Solesource Follow-on X Non-Commercial Item X Annual Appropriations	81,337	0.031	2
Spending Low X Solesource Follow-on X Non-Commercial Item X Disaster Appropriations	213	0.031	2
Spending High X Competed Setaside X Commercial Item X Annual Appropriations	1,471	0.033	2

Table A.16: Contract Concentration Index Cells (Continued)

Cell	No. Contracts	House Index Value	House Index 2-Quantile
Spending High X Solesource Setaside X Commercial Item X Annual Appropriations	170	0.037	2
Spending Low X Solesource Follow-on X Commercial Item X Disaster Appropriations	50	0.038	2
Spending Medium X Competed Full X Non-Commercial Item X War Appropriations	2,189	0.039	2
Spending Medium X Solesource Unique Source X Non-Commercial Item X Disaster Appropriations	40	0.040	2
Spending Low X Solesource Public Interest X Commercial Item X Disaster Appropriations	559	0.043	2
Spending High X Solesource Public Interest X Non-Commercial Item X Annual Appropriations	1,358	0.049	2
Spending High X Solesource Setaside X Non-Commercial Item X Annual Appropriations	382	0.049	2
Spending Low X Competed Setaside X Non-Commercial Item X War Appropriations	44	0.053	2
Spending Low X Solesource Setaside X Commercial Item X Disaster Appropriations	161	0.055	2
Spending Medium X Competed Setaside X Non-Commercial Item X Disaster Appropriations	71	0.057	2
Spending Low X Solesource Other X Non-Commercial Item X War Appropriations	911	0.059	2
Spending High X Competed Full X Non-Commercial Item X Disaster Appropriations	107	0.063	2
Spending Medium X Solesource Public Interest X Non-Commercial Item X Disaster Appropriations	43	0.067	2
Spending Medium X Solesource Brandname X Non-Commercial Item X Annual Appropriations	35	0.068	2
Spending Medium X Competed Full X Commercial Item X War Appropriations	491	0.069	2
Spending Medium X Solesource Unique Source X Non-Commercial Item X War Appropriations	26	0.070	2
Spending Low X Solesource Follow-on X Commercial Item X Annual Appropriations	32,694	0.078	2
Spending Low X Solesource Public Interest X Non-Commercial Item X Disaster Appropriations	832	0.082	2
Spending Medium X Solesource Setaside X Non-Commercial Item X Disaster Appropriations	22	0.087	2
Spending Medium X Solesource Unique Source X Commercial Item X Disaster Appropriations	14	0.089	2
Spending Low X Competed Setaside X Non-Commercial Item X Disaster Appropriations	2,230	0.090	2
Spending Medium X Solesource Public Interest X Commercial Item X Disaster Appropriations	16	0.092	2
Spending Medium X Solesource Follow-on X Non-Commercial Item X Disaster Appropriations	15	0.101	2
Spending Medium X Solesource Unique Source X Commercial Item X War Appropriations	37	0.102	2
Spending Medium X Competed Setaside X Commercial Item X Disaster Appropriations	50	0.105	2
Spending High X Competed Full X Commercial Item X Disaster Appropriations	13	0.111	2
Spending Low X Solesource Unique Source X Non-Commercial Item X War Appropriations	108	0.111	2
Spending Low X Solesource Public Interest X Commercial Item X War Appropriations	65	0.112	2
Spending Low X Solesource Public Interest X Non-Commercial Item X War Appropriations	139	0.112	2
Spending Low X Solesource Other X Non-Commercial Item X Annual Appropriations	1,197,395	0.114	2
Spending Low X Solesource Setaside X Commercial Item X War Appropriations	15	0.122	2
Spending Low X Solesource Setaside X Non-Commercial Item X Disaster Appropriations	250	0.123	2
Spending Medium X Solesource Other X Non-Commercial Item X Disaster Appropriations	14	0.124	2
Spending Medium X Solesource Other X Commercial Item X Disaster Appropriations	15	0.124	2
Spending Medium X Competed Setaside X Non-Commercial Item X War Appropriations	14	0.136	2
Spending High X Competed Full X Non-Commercial Item X War Appropriations	270	0.136	2
Spending High X Solesource Unique Source X Non-Commercial Item X War Appropriations	24	0.138	2
Spending Medium X Solesource Public Interest X Commercial Item X War Appropriations	23	0.160	2
Spending High X Solesource Public Interest X Non-Commercial Item X War Appropriations	22	0.160	2
Spending Medium X Competed Setaside X Commercial Item X War Appropriations	20	0.164	2
Spending Medium X Solesource Public Interest X Non-Commercial Item X War Appropriations	31	0.188	2
Spending High X Competed Full X Commercial Item X War Appropriations	156	0.219	2
Spending High X Solesource Follow-on X Commercial Item X Annual Appropriations	178	0.228	2
Spending High X Solesource Unique Source X Commercial Item X War Appropriations	18	0.240	2
Spending Medium X Solesource Setaside X Commercial Item X Disaster Appropriations	24	0.333	2
Spending Medium X Solesource Setaside X Non-Commercial Item X War Appropriations	12	0.340	2
Spending Medium X Solesource Other X Commercial Item X War Appropriations	17	0.375	2
Spending High X Solesource Unique Source X Non-Commercial Item X Disaster Appropriations	7	0.184	-
Spending High X Solesource Brandname X Commercial Item X Annual Appropriations	7	0.184	-
Spending High X Solesource Brandname X Non-Commercial Item X Annual Appropriations	7	0.184	-
Spending High X Solesource Public Interest X Non-Commercial Item X Disaster Appropriations	6	0.222	-
Spending High X Competed Setaside X Non-Commercial Item X War Appropriations	6	0.250	-
Spending Low X Solesource Brandname X Commercial Item X Disaster Appropriations	4	0.250	-
Spending High X Solesource Other X Non-Commercial Item X War Appropriations	7	0.278	-

Table A.17: Contract Concentration Index Cells (Continued)

Spending Low X Solesource Follow-on X Commercial Item X War Appropriations	6	0.375	-
Spending High X Competed Setaside X Commercial Item X Disaster Appropriations	2	0.500	-
Spending High X Competed Setaside X Commercial Item X War Appropriations	2	0.500	-
Spending High X Competed Setaside X Non-Commercial Item X Disaster Appropriations	2	0.500	-
Spending High X Solesource Other X Commercial Item X War Appropriations	4	0.500	-
Spending High X Solesource Setaside X Non-Commercial Item X Disaster Appropriations	2	0.500	-
Spending High X Solesource Public Interest X Commercial Item X Disaster Appropriations	2	0.500	-
Spending Low X Solesource Setaside X Non-Commercial Item X War Appropriations	10	0.520	-
Spending Medium X Solesource Other X Non-Commercial Item X War Appropriations	10	0.556	-
Spending High X Solesource Follow-on X Commercial Item X Disaster Appropriations	1	1.000	-
Spending High X Solesource Follow-on X Non-Commercial Item X Disaster Appropriations	3	1.000	-
Spending High X Solesource Other X Commercial Item X Disaster Appropriations	1	1.000	-
Spending High X Solesource Other X Non-Commercial Item X Disaster Appropriations	1	1.000	-
Spending Low X Solesource Brandname X Commercial Item X War Appropriations	2	1.000	-
Spending Low X Solesource Brandname X Non-Commercial Item X Disaster Appropriations	1	1.000	-
Spending Low X Solesource Brandname X Non-Commercial Item X War Appropriations	1	1.000	-
Spending Low X Solesource Follow-on X Non-Commercial Item X War Appropriations	4	1.000	-
Spending Medium X Solesource Follow-on X Commercial Item X Disaster Appropriations	2	1.000	-
Spending Medium X Solesource Follow-on X Commercial Item X War Appropriations	2	1.000	-
Spending High X Solesource Brandname X Commercial Item X Disaster Appropriations	0		-
Spending High X Solesource Brandname X Commercial Item X War Appropriations	0		-
Spending High X Solesource Brandname X Non-Commercial Item X Disaster Appropriations	0		-
Spending High X Solesource Brandname X Non-Commercial Item X War Appropriations	0		-
Spending High X Solesource Follow-on X Commercial Item X War Appropriations	2	-	-
Spending High X Solesource Follow-on X Non-Commercial Item X War Appropriations	0		-
Spending High X Solesource Unique Source X Commercial Item X Disaster Appropriations	0		-
Spending High X Solesource Setaside X Commercial Item X Disaster Appropriations	0		-
Spending High X Solesource Setaside X Commercial Item X War Appropriations	0		-
Spending High X Solesource Setaside X Non-Commercial Item X War Appropriations	0		-
Spending Medium X Solesource Brandname X Commercial Item X Disaster Appropriations	0		-
Spending Medium X Solesource Brandname X Commercial Item X War Appropriations	0		-
Spending Medium X Solesource Brandname X Non-Commercial Item X Disaster Appropriations	0		-
Spending Medium X Solesource Brandname X Non-Commercial Item X War Appropriations	0		-
Spending Medium X Solesource Follow-on X Non-Commercial Item X War Appropriations	1	-	-

A.2 Examples of Appropriations Lines

Figure A.1: Army Operations and Maintenance Program 2014 Appropriations Line Item

TITLE II

OPERATION AND MAINTENANCE

OPERATION AND MAINTENANCE, ARMY

For expenses, not otherwise provided for, necessary for the operation and maintenance of the Army, as authorized by law; and not to exceed $12,478,000 can be used for emergencies and extraordinary expenses, to be expended on the approval or authority of the Secretary of the Army, and payments may be made on his certificate of necessity for confidential military purposes, $31,072,902,000.

OPERATION AND MAINTENANCE, NAVY

For expenses, not otherwise provided for, necessary for the operation and maintenance of the Navy and the Marine Corps, as authorized by law; and not to exceed $14,804,000 can be used for emergencies and extraordinary expenses, to be expended on the approval or authority of the Secretary of the Navy, and payments may be made on his certificate of necessity for confidential military purposes, $38,120,821,000.

OPERATION AND MAINTENANCE, MARINE CORPS

For expenses, not otherwise provided for, necessary for the operation and maintenance of the Marine Corps, as authorized by law, $5,542,937,000.

Figure A.2: Navy Virginia-Class Submarine Program 2014 Appropriations Line Item

SHIPBUILDING AND CONVERSION, NAVY

For expenses necessary for the construction, acquisition, or conversion of vessels as authorized by law, including armor and armament thereof, plant equipment, appliances, and machine tools and installation thereof in public and private plants; reserve plant and Government and contractor-owned equipment layaway; procurement of critical, long lead time components and designs for vessels to be constructed or converted in the future; and expansion of public and private plants, including land necessary therefor, and such lands and interests therein, may be acquired, and construction prosecuted thereon prior to approval of title, as follows:

Carrier Replacement Program (AP), $554,798,000;
Virginia Class Submarine, $3,221,314,000;
Virginia Class Submarine (AP), $1,461,361,000;
CVN Refuelings (AP), $529,652,000;
DDG–1000 Program, $453,727,000;
DDG–51 Destroyer, $1,980,709,000;
DDG–51 Destroyer (AP), $100,723,000;
Littoral Combat Ship, $1,755,093,000;
LPD–17, $1,837,444,000;
LHA–Replacement, $1,999,191,000;
Joint High Speed Vessel, $372,332,000;
Oceanographic Ships, $89,000,000;
Moored Training Ship, $131,200,000;
LCAC Service Life Extension Program, $84,076,000;
Service Craft, $3,863,000; and
For outfitting, post delivery, conversions, and first destination transportation, $270,639,000.
Completion of Prior Year Shipbuilding Programs, $73,992,000.

In all: $14,919,114,000, to remain available for obligation until September 30, 2016: *Provided*, That additional obligations may be incurred after September 30, 2016, for engineering services, tests, evaluations, and other such budgeted work that must be performed in the final stage of ship construction: *Provided further*, That none of the funds provided under this heading for the construction or conversion of any naval vessel to be constructed in shipyards in the United States shall be expended in foreign facilities for the construction of major components of such vessel: *Provided further*, That none of the funds provided under this heading shall be used for the construction of any naval vessel in foreign shipyards.

Figure A.3: National Parks Service 2014 Appropriations Line Item

NATIONAL PARK SERVICE

OPERATION OF THE NATIONAL PARK SYSTEM

For expenses necessary for the management, operation, and maintenance of areas and facilities administered by the National Park Service and for the general administration of the National Park Service, $2,240,152,000, of which $9,832,000 for planning and interagency coordination in support of Everglades restoration and $97,883,000 for maintenance, repair, or rehabilitation projects for constructed assets, operation of the National Park Service automated facility management software system, and comprehensive facility condition assessments shall remain available until September 30, 2013.

NATIONAL RECREATION AND PRESERVATION

For expenses necessary to carry out recreation programs, natural programs, cultural programs, heritage partnership programs, environmental compliance and review, international park affairs, and grant administration, not otherwise provided for, $59,975,000: *Provided,* That section 502(c) of the Chesapeake Bay Initiative Act of 1998 (16 U.S.C. 461 note; Public Law 105–312) is amended by striking "2011" and inserting "2013".

Appendix B

Institutional Determinants of Municipal Fiscal Dynamics

B.1 Additional Results

Table B.1: First Stage Results

	(1) $\Delta log(Emp)$	(2) $\Delta log(Emp)$	(3) $\Delta log(Emp)$	(4) $\Delta log(Emp)$
Bartik	0.887***	0.677***	0.893***	0.663***
	(0.044)	(0.121)	(0.045)	(0.138)
Year FE	No	Yes	No	Yes
Muni FE	No	No	Yes	Yes
Observations	34500	34500	34500	34500
Adjusted R^2	0.353	0.379	0.374	0.402
F	410.64	31.19	388.19	23.16

Notes: Entries are coefficients from first-stage regressions. In all cases, the dependent variable is the actual change in log commuting zone employment and independent variables are the predicted change in log employment, calculated according to (2.1), and fixed effects, if any. Fixed effects coefficients are omitted. Standard errors, clustered at the commuting zone level, are presented in parentheses. *Significance*: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table B.2: Ordinary Least Squares Results (Reduced Form)

	$h=0$	$h=1$	$h=2$	$h=3$	$h=4$	$h=5$
***Panel 1**: Expenditures*						
$\Delta log(Emp)$	-0.089**	-0.022	0.080*	0.135***	0.243***	0.299***
	(0.037)	(0.044)	(0.047)	(0.050)	(0.051)	(0.052)
TEL $\times \Delta log(Emp)$	-0.261**	-0.495**	-0.317*	-0.007	0.025	-0.037
	(0.111)	(0.216)	(0.173)	(0.141)	(0.116)	(0.129)
TEL	0.035*	0.062***	0.075***	0.074***	0.083***	0.094***
	(0.018)	(0.021)	(0.021)	(0.024)	(0.027)	(0.031)
N	34153	33003	31853	30703	29553	28403
***Panel 2**: Capital Outlays*						
$\Delta log(Emp)$	-0.172	0.262*	0.483***	0.609***	0.636***	0.918***
	(0.136)	(0.140)	(0.150)	(0.157)	(0.162)	(0.173)
TEL $\times \Delta log(Emp)$	-1.336***	-1.794***	-0.994**	0.326	0.680	0.162
	(0.399)	(0.563)	(0.418)	(0.503)	(0.691)	(0.591)
TEL	0.097***	0.150***	0.143***	0.110**	0.124**	0.141***
	(0.024)	(0.034)	(0.045)	(0.047)	(0.049)	(0.048)
N	33971	32821	31671	30521	29371	28221
***Panel 3**: Transportation*						
$\Delta log(Emp)$	-0.068	0.036	0.362***	0.526***	0.437***	0.525***
	(0.068)	(0.079)	(0.093)	(0.111)	(0.096)	(0.095)
TEL $\times \Delta log(Emp)$	-0.074	-0.723**	-0.740**	0.024	0.176	0.212
	(0.206)	(0.350)	(0.310)	(0.221)	(0.237)	(0.211)
TEL	0.019	0.063**	0.076**	0.073**	0.076***	0.079***
	(0.014)	(0.026)	(0.031)	(0.029)	(0.023)	(0.022)
N	34148	32998	31848	30698	29548	28398

Notes: Dependent variables are given by each panel heading. Units of all dependent variables are real, per-capita 2004 U.S. dollars. h represents the forecast horizon, as outlined in equation (2.2). TEL is an indicator taking value one if a city faces a general expenditure or general revenue TEL during the year in which the shock occurs. *Emp* is employment in the commuting zone in which a city resides. Municipality and year fixed effects omitted. Standard errors are clustered at the commuting zone level and presented in parentheses. *Significance*: * $p<0.1$, ** $p<0.05$, *** $p<0.01$.

Table B.3: Ordinary Least Squares Results (Reduced Form, Continued)

	$h=0$	$h=1$	$h=2$	$h=3$	$h=4$	$h=5$
***Panel 4**: Public Maintenance*						
$\Delta log(Emp)$	-0.171**	-0.069	-0.051	0.063	0.152**	0.359***
	(0.068)	(0.078)	(0.081)	(0.084)	(0.077)	(0.077)
TEL $\times \Delta log(Emp)$	-0.460**	-0.751***	-0.554**	-0.244	-0.059	-0.324
	(0.192)	(0.223)	(0.258)	(0.298)	(0.285)	(0.286)
TEL	0.049***	0.077**	0.083**	0.081*	0.094**	0.117***
	(0.018)	(0.030)	(0.039)	(0.044)	(0.045)	(0.043)
N	34132	32982	31832	30682	29532	28382
***Panel 5**: Public Safety*						
$\Delta log(Emp)$	-0.051*	0.012	0.156***	0.162***	0.219***	0.201***
	(0.031)	(0.037)	(0.039)	(0.047)	(0.054)	(0.055)
TEL $\times \Delta log(Emp)$	-0.041	-0.215	-0.051	-0.030	-0.291**	-0.225
	(0.170)	(0.343)	(0.296)	(0.212)	(0.130)	(0.146)
TEL	0.010	0.022	0.024	0.030*	0.044***	0.046***
	(0.013)	(0.017)	(0.018)	(0.018)	(0.016)	(0.016)
N	34137	32987	31837	30687	29537	28387
***Panel 6**: Government Administration*						
$\Delta log(Emp)$	-0.068	0.036	0.362***	0.526***	0.437***	0.525***
	(0.068)	(0.079)	(0.093)	(0.111)	(0.096)	(0.095)
TEL $\times \Delta log(Emp)$	-0.074	-0.723**	-0.740**	0.024	0.176	0.212
	(0.206)	(0.350)	(0.310)	(0.221)	(0.237)	(0.211)
TEL	0.019	0.063**	0.076**	0.073**	0.076***	0.079***
	(0.014)	(0.026)	(0.031)	(0.029)	(0.023)	(0.022)
N	34148	32998	31848	30698	29548	28398

Notes: Dependent variables are given by each panel heading. Units of all dependent variables are real, per-capita 2004 U.S. dollars. h represents the forecast horizon, as outlined in equation (2.2). TEL is an indicator taking value one if a city faces a general expenditure or general revenue TEL during the year in which the shock occurs. *Emp* is employment in the commuting zone in which a city resides. Municipality and year fixed effects omitted. Standard errors are clustered at the commuting zone level and presented in parentheses. *Significance*: * $p<0.1$, ** $p<0.05$, *** $p<0.01$.

B.2 Robustness

Table B.4: Baseline Results (Counties)

	$h=0$	$h=1$	$h=2$	$h=3$	$h=4$	$h=5$
***Panel 1**: Expenditures*						
$\Delta log(Emp)$	0.027	-0.228	-0.017	-0.083	0.247	0.152
	(0.128)	(0.158)	(0.175)	(0.218)	(0.211)	(0.166)
TEL $\times \Delta log(Emp)$	-0.295*	-0.650***	-0.371*	0.047	0.440***	0.184
	(0.156)	(0.215)	(0.204)	(0.183)	(0.169)	(0.174)
TEL	0.037***	0.068***	0.078***	0.072***	0.069***	0.086***
	(0.010)	(0.013)	(0.017)	(0.019)	(0.020)	(0.021)
N	34153	33003	31853	30703	29553	28403
***Panel 2**: Capital Outlays*						
$\Delta log(Emp)$	0.821*	-0.327	1.019*	-0.384	0.552	0.947**
	(0.442)	(0.433)	(0.546)	(0.547)	(0.496)	(0.435)
TEL $\times \Delta log(Emp)$	-2.236***	-2.917***	-2.307***	0.183	1.258**	0.789**
	(0.514)	(0.582)	(0.685)	(0.505)	(0.565)	(0.402)
TEL	0.131***	0.191***	0.189***	0.114**	0.103**	0.121***
	(0.029)	(0.041)	(0.056)	(0.051)	(0.044)	(0.039)
N	33971	32821	31671	30521	29371	28221
***Panel 3**: Transportation*						
$\Delta log(Emp)$	-0.159	-0.100	0.147	0.380	0.545*	0.635**
	(0.199)	(0.235)	(0.309)	(0.255)	(0.290)	(0.277)
TEL $\times \Delta log(Emp)$	-0.213	-1.682***	-1.481***	-0.435	0.132	0.188
	(0.212)	(0.431)	(0.428)	(0.336)	(0.208)	(0.375)
TEL	0.023*	0.095***	0.102***	0.089***	0.078***	0.081**
	(0.013)	(0.021)	(0.023)	(0.024)	(0.027)	(0.034)
N	34148	32998	31848	30698	29548	28398

Notes: Dependent variables are given by each panel heading. Units of all dependent variables are real, per-capita 2004 U.S. dollars. h represents the forecast horizon, as outlined in equation (2.2). TEL is an indicator taking value one if a city faces a general expenditure or general revenue TEL during the year in which the shock occurs. *Emp* is employment in the county in which a city resides. Municipality and year fixed effects omitted. Standard errors are clustered at the county level and presented in parentheses. *Significance*: * $p<0.1$, ** $p<0.05$, *** $p<0.01$.

Table B.5: Baseline Results (Counties, Continued)

	$h=0$	$h=1$	$h=2$	$h=3$	$h=4$	$h=5$
***Panel 4**: Public Maintenance*						
$\Delta log(Emp)$	-0.119	-0.135	0.001	-0.185	0.413	0.211
	(0.188)	(0.220)	(0.292)	(0.272)	(0.252)	(0.234)
TEL $\times \Delta log(Emp)$	-0.403*	-0.950***	-0.735**	-0.171	0.151	-0.369
	(0.245)	(0.235)	(0.340)	(0.389)	(0.263)	(0.263)
TEL	0.048**	0.086***	0.091**	0.080**	0.087***	0.120***
	(0.022)	(0.030)	(0.040)	(0.039)	(0.033)	(0.033)
N	34132	32982	31832	30682	29532	28382
***Panel 5**: Public Safety*						
$\Delta log(Emp)$	0.022	0.010	0.107	0.120	0.364***	0.085
	(0.111)	(0.133)	(0.136)	(0.134)	(0.120)	(0.112)
TEL $\times \Delta log(Emp)$	0.115	-0.137	0.106	-0.056	-0.101	-0.131
	(0.162)	(0.321)	(0.329)	(0.148)	(0.141)	(0.162)
TEL	0.006	0.020	0.020	0.031*	0.039*	0.044**
	(0.010)	(0.016)	(0.015)	(0.016)	(0.021)	(0.020)
N	34137	32987	31837	30687	29537	28387
***Panel 6**: Government Administration*						
$\Delta log(Emp)$	0.010	-0.113	0.276	0.360	0.466*	0.254
	(0.226)	(0.316)	(0.258)	(0.318)	(0.265)	(0.308)
TEL $\times \Delta log(Emp)$	0.747**	0.787**	1.099**	-0.229	0.587	0.417
	(0.328)	(0.351)	(0.450)	(0.333)	(0.456)	(0.336)
TEL	-0.048**	-0.055*	-0.062*	-0.026	-0.055	-0.044
	(0.021)	(0.028)	(0.037)	(0.038)	(0.041)	(0.042)
N	34020	32870	31720	30570	29420	28270

Notes: Dependent variables are given by each panel heading. Units of all dependent variables are real, per-capita 2004 U.S. dollars. h represents the forecast horizon, as outlined in equation (2.2). TEL is an indicator taking value one if a city faces a general expenditure or general revenue TEL during the year in which the shock occurs. *Emp* is employment in the county in which a city resides. Municipality and year fixed effects omitted. Standard errors are clustered at the county level and presented in parentheses. *Significance*: * $p<0.1$, ** $p<0.05$, *** $p<0.01$.

Table B.6: Baseline Results (Excluding Missing Data)

	$h=0$	$h=1$	$h=2$	$h=3$	$h=4$	$h=5$
***Panel 1**: Expenditures*						
$\Delta log(Emp)$	-0.181	-0.019	-0.082	0.092	0.356*	0.707***
	(0.170)	(0.199)	(0.147)	(0.179)	(0.185)	(0.202)
TEL $\times \Delta log(Emp)$	-0.030	-0.234	0.279	0.134	0.117	-0.063
	(0.145)	(0.215)	(0.176)	(0.265)	(0.212)	(0.283)
TEL	-0.000	0.019	0.019	0.033*	0.047**	0.056**
	(0.012)	(0.016)	(0.015)	(0.020)	(0.021)	(0.023)
N	13170	12731	12292	11853	11414	10975
***Panel 2**: Capital Outlays*						
$\Delta log(Emp)$	-0.235	-0.864	-0.126	-0.163	0.168	1.815***
	(0.593)	(0.684)	(0.708)	(0.610)	(0.537)	(0.560)
TEL $\times \Delta log(Emp)$	-1.626**	-2.047**	-1.399**	-0.375	0.374	0.275
	(0.793)	(0.902)	(0.638)	(0.839)	(0.482)	(1.005)
TEL	0.078**	0.139***	0.130**	0.127**	0.133**	0.125*
	(0.037)	(0.052)	(0.052)	(0.058)	(0.054)	(0.065)
N	13170	12731	12292	11853	11414	10975
***Panel 3**: Transportation*						
$\Delta log(Emp)$	-0.450	-0.448	0.184	0.968***	0.451	0.706*
	(0.334)	(0.352)	(0.354)	(0.360)	(0.337)	(0.412)
TEL $\times \Delta log(Emp)$	-0.301	-1.242*	-0.989**	-0.184	-0.638*	-0.014
	(0.385)	(0.664)	(0.462)	(0.288)	(0.384)	(0.380)
TEL	0.005	0.049	0.053	0.055*	0.083**	0.082**
	(0.022)	(0.032)	(0.032)	(0.030)	(0.036)	(0.034)
N	13170	12731	12292	11853	11414	10975

Notes: Regressions estimated on those municipalities without missing data in any spending category. Dependent variables are given by each panel heading. Units of all dependent variables are real, per-capita 2004 U.S. dollars. h represents the forecast horizon, as outlined in equation (2.2). TEL is an indicator taking value one if a city faces a general expenditure or general revenue TEL during the year in which the shock occurs. *Emp* is employment in the commuting zone in which a city resides. Municipality and year fixed effects omitted. Standard errors are clustered at the commuting zone level and presented in parentheses. *Significance*: * $p<0.1$, ** $p<0.05$, *** $p<0.01$.

Table B.7: Baseline Results (Excluding Missing Data, Continued)

	$h=0$	$h=1$	$h=2$	$h=3$	$h=4$	$h=5$
***Panel 4**: Public Maintenance*						
$\Delta log(Emp)$	-0.328	-0.315	-0.447	-0.477	0.358	0.635*
	(0.347)	(0.344)	(0.403)	(0.465)	(0.367)	(0.350)
TEL $\times \Delta log(Emp)$	-0.548	-1.148**	-0.507	-0.463	-0.587	-0.955
	(0.369)	(0.462)	(0.585)	(0.527)	(0.427)	(0.591)
TEL	0.036	0.076*	0.073	0.079	0.101**	0.138***
	(0.024)	(0.039)	(0.049)	(0.051)	(0.044)	(0.041)
N	13170	12731	12292	11853	11414	10975
***Panel 5**: Public Safety*						
$\Delta log(Emp)$	-0.006	0.084	0.234*	0.326**	0.515**	0.528***
	(0.130)	(0.126)	(0.127)	(0.160)	(0.211)	(0.188)
TEL $\times \Delta log(Emp)$	0.091	0.059	0.239	0.180	-0.206	-0.339**
	(0.136)	(0.185)	(0.274)	(0.198)	(0.154)	(0.141)
TEL	-0.003	0.003	0.003	0.012	0.036*	0.040**
	(0.010)	(0.016)	(0.016)	(0.018)	(0.019)	(0.020)
N	13170	12731	12292	11853	11414	10975
***Panel 6**: Government Administration*						
$\Delta log(Emp)$	0.930**	0.657*	0.987***	0.664**	1.055***	1.088***
	(0.393)	(0.392)	(0.344)	(0.272)	(0.340)	(0.383)
TEL $\times \Delta log(Emp)$	0.749*	0.528	1.158	0.450	0.499	0.719*
	(0.434)	(0.516)	(0.888)	(0.366)	(0.381)	(0.398)
TEL	-0.082*	-0.094	-0.132*	-0.114**	-0.105**	-0.101*
	(0.047)	(0.061)	(0.075)	(0.056)	(0.052)	(0.059)
N	13170	12731	12292	11853	11414	10975

Notes: Regressions estimated on those municipalities without missing data in any spending category. Dependent variables are given by each panel heading. Units of all dependent variables are real, per-capita 2004 U.S. dollars. h represents the forecast horizon, as outlined in equation (2.2). TEL is an indicator taking value one if a city faces a general expenditure or general revenue TEL during the year in which the shock occurs. *Emp* is employment in the commuting zone in which a city resides. Municipality and year fixed effects omitted. Standard errors are clustered at the commuting zone level and presented in parentheses. *Significance*: * $p<0.1$, ** $p<0.05$, *** $p<0.01$.

Appendix C

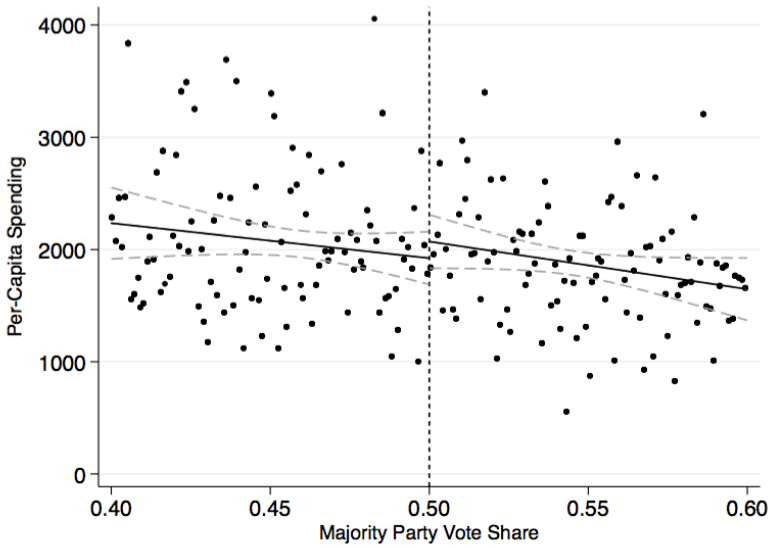
Procuring Protection? Evidence from the U.S. House of Representatives

C.1 Additional Tables and Figures

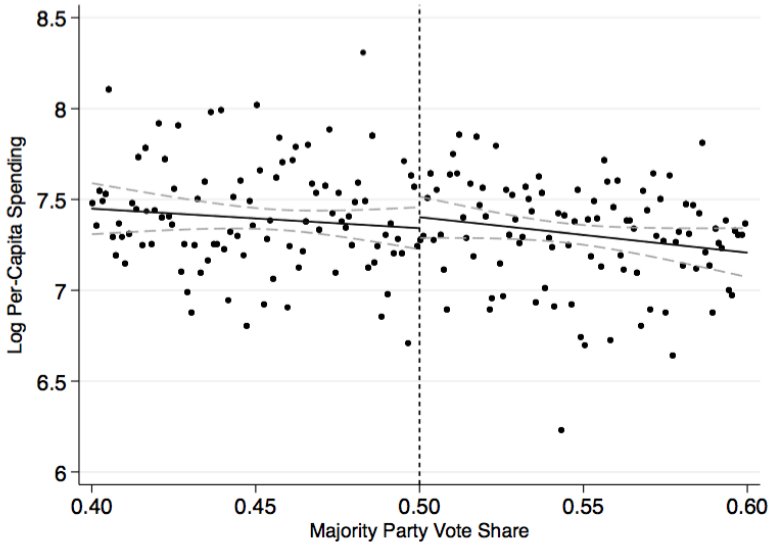
Table C.1: Additional FAADS Spending Results

	(1)	(2)	(3)	(4)	(5)	(6)
	Panel A: Levels					
MajWins	148.442	104.444	185.631	109.253	-21.253	-95.501
	(170.323)	(91.766)	(241.453)	(120.304)	(379.107)	(167.576)
DV Mean	1974.609	2081.798	1972.224	2084.849	2064.726	2163.37
R^2	0.005	0.712	0.002	0.733	0.003	0.768
	Panel B: Logs					
MajWins	0.061	0.023	0.127	0.029	-0.001	-0.018
	(0.082)	(0.030)	(0.119)	(0.040)	(0.182)	(0.051)
DV Mean	7.354	7.436	7.360	7.446	7.387	7.463
R^2	0.004	0.832	0.004	0.846	0.005	0.886
Range	[.40, .60]		[.45, .55]		[.48, .52]	
Controls	No	Yes	No	Yes	No	Yes
N Elections	1448	1297	698	622	281	250

Notes: Standard errors in parentheses. All regressions use triangular weights. Range denotes values of two-party majority party vote share.



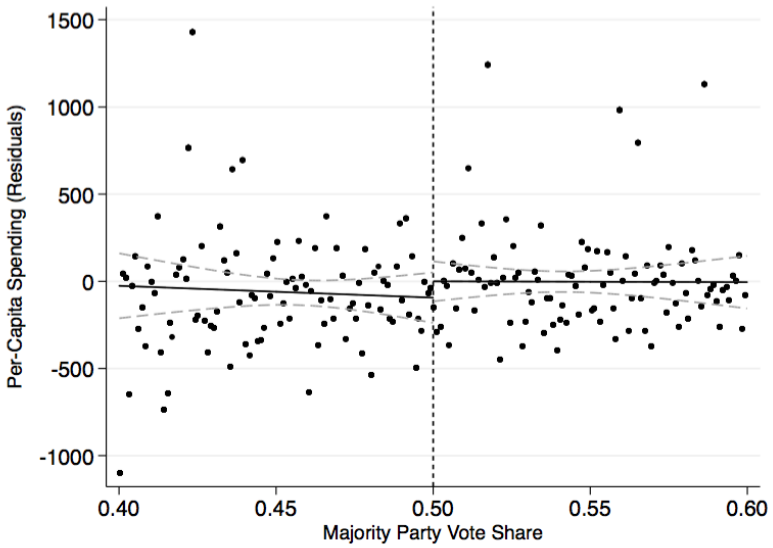
(a) Levels



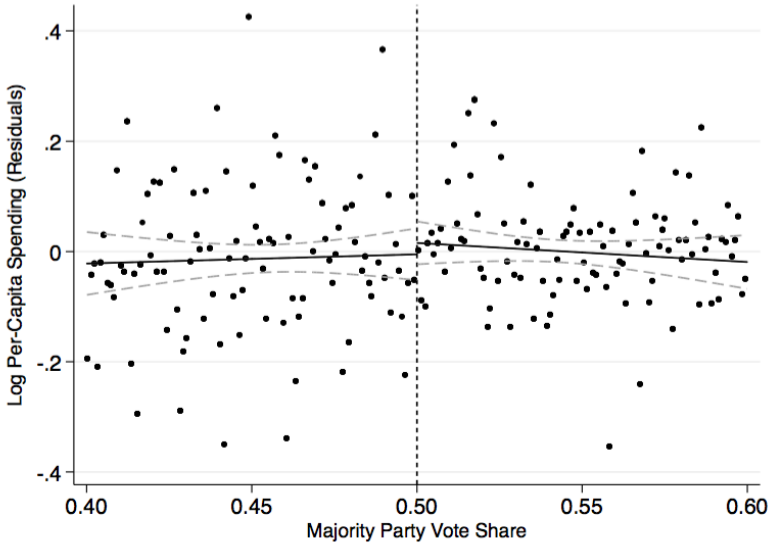
(b) Logs

Figure C.1: Additional FAADS Spending Results (No Controls)

Notes: The *x*-axis denotes the two-party majority candidate vote share. In panel (a), *y*-axis values represent average real, per-capita FAADS spending within a given vote share bin. In panel (b), *y*-axis values represent the average of the log of real, per-capita FAADS spending within a given bin. I use a bin width of 0.1 percentage points. Solid lines are estimated via ordinary least squares using triangular weights. Dashed lines represent 95% confidence intervals.



(a) Levels



(b) Logs

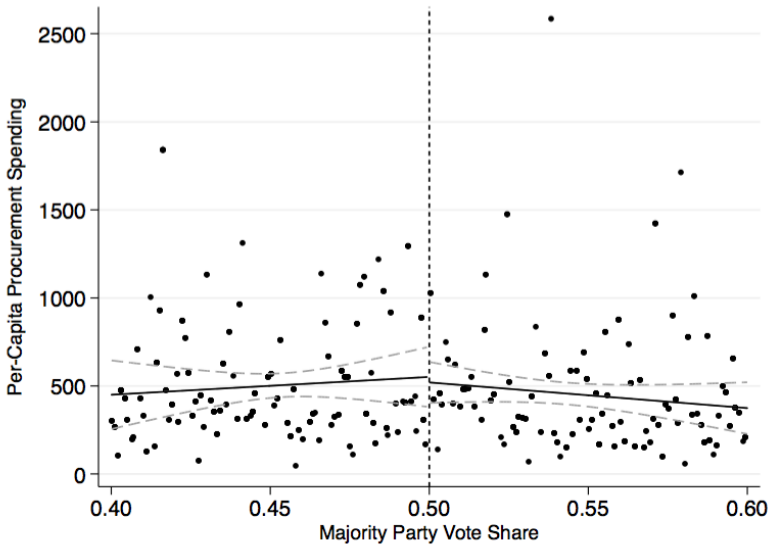
Figure C.2: Additional FAADS Spending Results (With Controls)

Notes: The *x*-axis denotes the two-party majority candidate vote share. In panel (a), *y*-axis values represent average residuals of real, per-capita FAADS spending within a given vote share bin. In panel (b), *y*-axis values represent the average residuals of the log of real, per-capita FAADS spending within a given bin. Residuals are taken from regressions of spending on the controls listed in equation (3.1). I use a bin width of 0.1 percentage points. Solid lines are estimated via ordinary least squares using triangular weights. Dashed lines represent 95% confidence intervals.

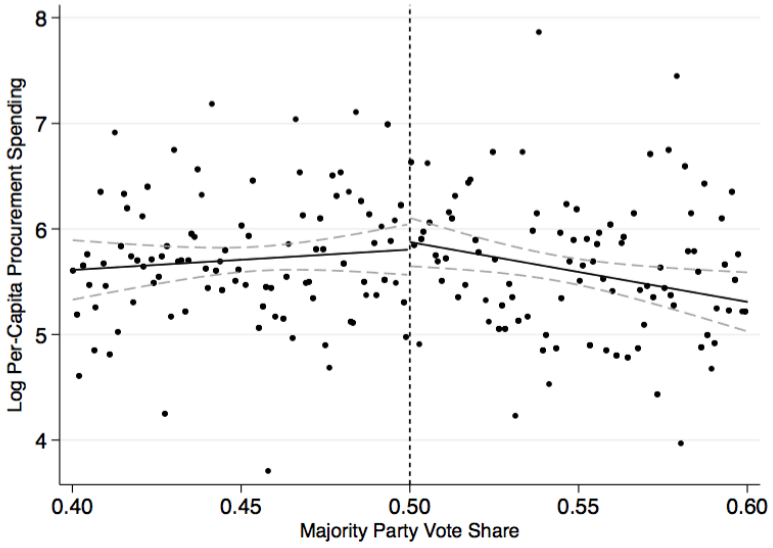
Table C.2: Additional Procurement Spending Results

	(1)	(2)	(3)	(4)	(5)	(6)
	Panel A: Levels					
MajWins	-31.469	8.652	-63.250	-57.943	25.094	-147.022
	(105.114)	(60.860)	(153.766)	(82.336)	(270.797)	(137.470)
DV Mean	479.005	442.015	494.803	463.190	533.686	502.313
R^2	0.005	0.792	0.007	0.808	0.004	0.786
	Panel B: Logs					
MajWins	0.071	-0.049	0.186	-0.169	0.294	-0.232
	(0.169)	(0.093)	(0.235)	(0.132)	(0.367)	(0.196)
DV Mean	5.666	5.603	5.722	5.637	5.859	5.780
R^2	0.011	0.799	0.022	0.803	0.009	0.755
Range	[.40, .60]		[.45, .55]		[.48, .52]	
Controls	No	Yes	No	Yes	No	Yes
N Elections	646	522	299	235	128	96

Notes: Standard errors in parentheses. All regressions use triangular weights. Range denotes values of two-party majority party vote share.



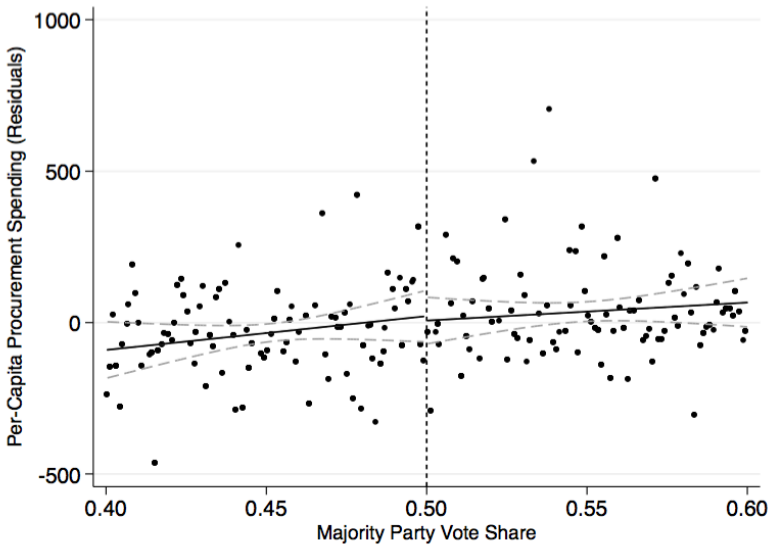
(a) Levels



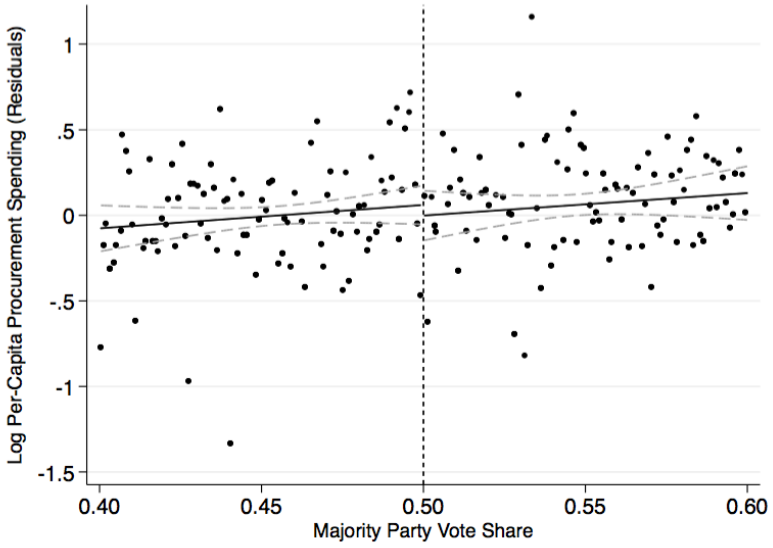
(b) Logs

Figure C.3: Additional Procurement Spending Results (No Controls)

Notes: The *x*-axis denotes the two-party majority candidate vote share. In panel (a), *y*-axis values represent average real, per-capita procurement spending within a given vote share bin. In panel (b), *y*-axis values represent the average of the log of real, per-capita procurement spending within a given bin. I use a bin width of 0.1 percentage points. Solid lines are estimated via ordinary least squares using triangular weights. Dashed lines represent 95% confidence intervals.



(a) Levels



(b) Logs

Figure C.4: Additional Procurement Spending Results (With Controls)

Notes: The *x*-axis denotes the two-party majority candidate vote share. In panel (a), *y*-axis values represent average residuals of real, per-capita procurement spending within a given vote share bin. In panel (b), *y*-axis values represent the average residuals of the log of real, per-capita procurement spending within a given bin. Residuals are taken from regressions of spending on the controls listed in equation (3.1). I use a bin width of 0.1 percentage points. Solid lines are estimated via ordinary least squares using triangular weights. Dashed lines represent 95% confidence intervals.

References

Aidt, Toke S., and Julia Shvets. 2012. "Distributive Politics and Electoral Incentives: Evidence from Seven US State Legislatures." *American Economic Journal: Economic Policy*, 4(3): 1–29.

Akey, Pat. 2015. "Valuing Changes in Political Networks: Evidence from Campaign Contributions to Close Congressional Elections." *Review of Financial Studies*, 28(11): 3188–3223.

Albouy, David. 2013. "Partisan Representation in Congress and the Geographic Distribution of Federal Funds." *Review of Economics and Statistics*, 95(1): 127–141.

Aldrich, John H., and David W. Rohde. 2000. "The Republican Revolution and the House Appropriations Committee." *Journal of Politics*, 62(1): 1–33.

Aldrich, John H., and David W. Rohde. 2001. "The Logic of Conditional Party Government: Revisiting the Electoral Connection." In *Congress Reconsidered.* . 7th ed., , ed. Lawrence Dodd and Bruce Oppenheimer, 269–292. Washington, D.C.:Congressional Quarterly Press.

Ansolabehere, Stephen, and James M. Synder Jr. 2002. "The Incumbency Advantage in U.S. Elections: An Analysis of State and Federal Offices." *Election Law Journal*, 1(3): 315–338.

Autor, David H., David Dorn, and Gordon H. Hanson. 2013. "The China Syndrome: Local Labor Market Effects of Import Competition in the United States." *American Economic Review*, 103(6): 2121–68.

Balla, Steven J., Eric D. Lawrence, Forrest Maltzman, and Lee Sigelman. 2002. "Partisanship, Blame Avoidance, and the Distribution of Legislative Pork." *American Journal of Political Science*, 46(3): 515–525.

Bartik, Timothy J. 1991. *Who Benefits from State and Local Economic Development Policies?* Kalamazoo, M:W.E. Upjohn Institute for Employment Research.

Berry, Christopher R., and Anthony Fowler. 2016. "Cardinals or Clerics? Congressional Committees and the Distribution of Pork." *American Journal of Political Science*, 60(3): 692–708.

Berry, Christopher R., and William G. Howell. 2007. "Accountability and Local Elections: Rethinking Retrospective Voting." *Journal of Politics*, 69(3): 844–858.

Berry, Christopher R., Barry C. Burden, and William G. Howell. 2010. "The President and the Distribution of Federal Spending." *American Political Science Review*, 104(4): 783–799.

Bickers, Kenneth N., and Robert M. Stein. 1996. "The Electoral Dynamics of the Federal Pork Barrel." *American Journal of Political Science*, 40(4): 1300–1326.

Bohn, Henning, and Robert P. Inman. 1996. "Balanced-Budget Rules and Public Deficits: Evidence from the U.S. States." *Carnegie-Rochester Conference Series on Public Policy*, 45: 13–76.

Boone, Christopher, Arindrajit Dube, and Ethan Kaplan. 2014. "The Political Economy of Discretionary Spending: Evidence from the American Recovery and Reinvestment Act." *Brookings Papers on Economic Activity*, Spring: 375–428.

Bracco, Emanuele, Ben Lockwood, Francesco Porcelli, and Michela Redoano. 2015. "Intergovernmental grants as signals and the alignment effect: Theory and evidence." *Journal of Public Economics*, 123(2015): 78–91.

Brogaard, Jonathan, Matthew Denes, and Ran Duchin. 2016. "Political Connections, Incentives and Innovation: Evidence from Contract-Level Data." *Working Paper*.

Buettner, Thiess, and David E. Wildasin. 2006. "The dynamics of municipal fiscal adjustment." *Journal of Public Economics*, 90(6): 1115–1132.

Carsey, Thomas M., and Barry Rundquist. 1999*a*. "Party and Committee in Distributive Politics: Evidence from Defense Spending." *Journal of Politics*, 61(4): 1156–1169.

Carsey, Thomas M., and Barry Rundquist. 1999*b*. "The reciprocal relationship between state defense interest and committee representation in Congress." *Public Choice*, 99(3): 455–463.

Carsey, Thomas M., Barry Rundquist, and Sharon Fox. 1997. "Defense Spending and Economic Development in the American States, 1970-89: Untangling a Complex Relationship." *Paper presented at the annual meeting of the Midwest Political Science Association, Chicago*.

Caughey, Devin, and Jasjeet S. Sekhon. 2011. "Elections and the Regression Discontinuity Design: Lessons from Close U.S. House Races, 1942-2008." *Political Analysis*, 19(4): 385–408.

Clemens, Jeffrey. 2012. "State Fiscal Adjustment During Times of Stress: Possible Causes of the Severity and Composition of Budget Cuts." *Working Paper*.

Cohen, Lauren, and Christopher Malloy. 2016. "Mini West Virginia: Corporations as Government Dependents." *Working Paper*.

Cohen, Lauren, Joshua Coval, and Christopher Malloy. 2011. "Do Powerful Politicians Cause Corporate Downsizing?" *Journal of Political Economy*, 119(6): 1015–1060.

Coviello, Decio, and Stefano Gagliarducci. 2017. "Tenure in Office and Public Procurement." *American Economic Journal: Economic Policy*, 9(3): 59–105.

Cox, Gary W., and Mathew D. McCubbins. 1986. "Electoral Politics as a Redistributive Game." *Journal of Politics*, 48(2): 370–389.

Cox, Gary W., and Mathew D. McCubbins. 1993. *Legislative Leviathan: Party Government in the House.* Berkeley: University of California Press.

Cox, Gary W., and Mathew D. McCubbins. 2005. *Setting the Agenda: Responsible Government in the House of Representatives.* Cambridge: Cambridge University Press.

Crespin, Michael H., and Charles J. Finocchiaro. 2008. "Distributive and Partisan Politics in the U.S. Senate: An Exploration of Earmarks." In *Why Not Parties? Party Effects in the United States Senate*. , ed. Jason M. Roberts Nathan W. Monroe and David W. Monroe, 229–251. University of Chicago Press.

Dahlberg, Matz, and Eva Johansson. 2002. "On the Vote-Purchasing Behavior of Incumbent Governments." *American Political Science Review*, 96(1): 27–40.

Dixit, Avinash, and John Londregan. 1996. "The Determinants of Success of Special Interests in Redistributive Politics." *Journal of Politics*, 58(4): 1132–1155.

Do, Quoc-Anh, Yen-Teik Lee, and Bang Dang Nguyen. 2015. "Political Connections and Firm Value: Evidence from the Regression Discontinuity Design of Close Gubernatorial Elections." *CEPR Discussion Paper 10526*.

Dube, Arindrajit, Ethan Kaplan, and Suresh Naidu. 2011. "Coups, Corporations, and Classified Information." *Quarterly Journal of Economics*, 126(3): 1375–1409.

Dynes, Adam M., and Gregory A. Huber. 2015. "Partisanship and the Allocation of Federal Spending: Do Same-Party Legislators or Voters Benefit from Shared Party Affiliation with the President and House Majority." *American Political Science Review*, 109(1): 172–186.

Eckert, Tony. 2006. "Former comrades angered by 'bribe menu'." *San Diego Union-Tribune*.

Eggers, Andrew C., Anthony Fowler, Jens Hainmueller, Andrew B. Hall, and James M. Synder Jr. 2015. "On the Validity of the Regression Discontinuity Design for Estimating

Electoral Effects: New Evidence from Over 40,000 Close Races." *American Journal of Political Science*, 59(1): 259–274.

Elder, Harold W. 1992. "Exploring the Tax Revolt: an Analysis of the Effects of State Tax and Expenditure Limitation Laws." *Public Finance Review*, 20(1): 47–63.

Evans, Diana. 1994. "Policy and Pork: The Use of Pork Barrel Projects to Build Policy Coalitions in the House of Representatives." *American Journal of Political Science*, 38(4): 894–917.

Evans, Diana. 2004. *Greasing the Wheels: Using Pork Barrel Projects to Build Majority Coalitions in Congress.* Cambridge University Press.

Federal Acquisition Regulation (FAR). 2012. "48 C.F.R. ch.1."

Folke, Olle, Torsten Persson, and Johanna Rickne. 2017. "Dynastic Political Rents? Economic Benefits to Relatives of Top Politicians." *Economic Journal*, 127(October): F495–F517.

Fowler, Anthony, and Andrew B. Hall. 2017. "Long-Term Consequences of Election Results." *British Journal of Political Science*, 47(2): 351–372.

Glaeser, Edward L. 2013. "Chapter 4 - Urban Public Finance." In *Handbook of Public Economics*. Vol. 5, 195–256. North Holland.

Golden, Miriam A., and Lucio Picci. 2008. "Pork-Barrel Politics in Postwar Italy, 1953-94." *American Journal of Political Science*, 52(2): 268–289.

Goldman, Eitan, Jörg Rocholl, and Jongil So. 2013. "Politically Connected Boards of Directors and The Allocation of Procurement Contracts." *Review of Finance*, 17(5): 1617–1648.

Gordon, Sanford C. 2011. "Politicizing Agency Spending Authority: Lessons from a Bush-Era Scandal." *American Political Science Review*, 105(4): 717–734.

Gropper, Daniel M., John S. Jahera Jr., and Jung Chul Park. 2013. "Does it help to have friends in high places? Bank stock performance and congressional committee chairmanships." *Journal of Banking & Finance*, 37(2013): 1986–1999.

Healy, Andrew, and Neil Malhotra. 2013. "Retrospective Voting Reconsidered." *Annual Review of Political Science*, 16(1): 285–306.

Hyytinen, Ari, Sofia Lundberg, and Otto Toivanen. 2011. "Politics and Procurement: Evidence from Cleaning Contracts." *Working Paper*.

Imbens, Guido W., and Thomas Lemieux. 2008. "Regression discontinuity designs: A guide to practice." *Journal of Econometrics*, 142(2008): 615–635.

Johansson, Eva. 2003. "Intergovernmental grants as a tactical instrument: empirical evidence from Swedish municipalities." *Journal of Public Economics*, 87(2003): 883–915.

Johnson, Grant E., and Elizabeth A. Roer. 2018. "Procuring Pork: Contract Characteristics and Channels of Influence." *Working Paper*.

Jordà, Òscar. 2005. "Estimation and Inference of Impulse Responses by Local Projections." *American Economic Review*, 95(1): 161–182.

Joyce, Philip G., and Daniel R. Mullins. 1991. "The Changing Fiscal Structure of the State and Local Public Sector: The Impact of Tax and Expenditure Limitations." *Public Administration Review*, 51(3): 240.

Keefer, Philip, and Stuti Khemani. 2009. "When Do Legislators Pass on Pork? The Role of Political Parties in Determining Legislator Effort." *American Political Science Review*, 103(1): 99–112.

Kiewiet, Roderick, and Mathew D. McCubbins. 1991. *The Logic of Delegation: Congressional Parties and the Appropriations Process.* Chicago: University of Chicago Press.

Knight, Brian. 2005. "Estimating the Value of Proposal Power." *American Economic Review*, 95(5): 1639–1652.

Kousser, Thad, Matthew D. McCubbins, and Ellen Moule. 2008. "For Whom the TEL Tolls: Can State Tax and Expenditure Limits Effectively Reduce Spending?" *State Politics & Policy Quarterly*, 8(4): 331–361.

Lazarus, Jeffrey. 2009. "Party, Electoral Vulnerability, and Earmarks in the U.S. House of Representatives." *Journal of Politics*, 71(3): 1050–1061.

Lazarus, Jeffrey. 2010. "Giving the People What They Want? The Distribution of Earmarks in the U.S. House of Representatives." *American Journal of Political Science*, 54(2): 338–353.

Lazarus, Jeffrey, and Amy Steigerwalt. 2009. "Different Houses: The Distribution of Earmarks in the U.S. House and Senate." *Legislative Studies Quarterly*, 34(3): 347–373.

Leduc, Sylvain, and Daniel Wilson. 2013. "Roads to Prosperity or Bridges to Nowhere? Theory and Evidence on the Impact of Public Infrastructure Investment." *NBER Macroeconomics Annual*, 27(1): 89–142.

Lee, David S. 2008. "Randomized experiments from non-random selection in U.S. House elections." *Journal of Econometrics*, 142(2008): 675–697.

Lee, David S., Enrico Moretti, and Matthew J. Butler. 2004. "Do Voters Affect or Elect

Policies? Evidence from the U.S. House." *Quarterly Journal of Economics*, 119(3): 807–859.

Lee, Frances E. 2003. "Geographic Politics in the U.S. House of Representatives: Coalition Building and Distribution of Benefits." *American Journal of Political Science*, 47(4): 714–728.

Levitt, Steven D., and James M. Poterba. 1999. "Congressional distributive politics and state economic performance." *Public Choice*, 99(1): 185–216.

Levitt, Steven D., and James M. Snyder Jr. 1995. "Political Parties and the Distribution of Federal Outlays." *American Journal of Political Science*, 39(4): 958–980.

Levitt, Steven D., and James M. Snyder Jr. 1997. "The Impact of Federal Spending on House Election Outcomes." *Journal of Political Economy*, 105(1): 30–53.

Lindbeck, Assar, and Jörgen W. Weibull. 1987. "Balanced-budget redistribution as the outcome of political competition." *Public Choice*, 52(3): 273–297.

Manacorda, Marco, Edward Miguel, and Andrea Vigorito. 2011. "Government Transfers and Political Support." *American Economic Journal: Applied Economics*, 3(3): 1–28.

Martin, Paul S. 2003. "Voting's Rewards: Voter Turnout, Attentive Publics, and Congressional Allocation of Federal Money." *American Journal of Political Science*, 47(1): 110–127.

Maser, Steven M., Vladimir Subbotin, and Fred Thompson. 2012. "How Bid-Protest Mechanisms Mitigate Opportunism in Government Contracting." *International Public Management Journal*, 15(2): 137–159.

McCrary, Justin. 2008. "Manipulation of the running variable in the regression discontinuity design: A density test." *Journal of Econometrics*, 142(2): 698–714.

Misiolek, Walter S., and Harold W. Elder. 1988. "Tax Structure and the Size of Government: An Empirical Analysis of the Fiscal Illusion and Fiscal Stress Arguments." *Public Choice*, 57(3): 233–245.

Mullins, Daniel R., and Bruce A. Wallin. 2004. "Tax and Expenditure Limitations: Introduction and Overview." *Public Budgeting & Finance*, 24(4): 2–15.

Mullins, Daniel R., and Philip G. Joyce. 1996. "Tax and Expenditure Limitations and State and Local Fiscal Structure: An Empirical Assessment." *Public Budgeting & Finance*, 16(1): 75–101.

Payne, A. Abigail. 2003. "The Effects of Congressional Appropriation Committee Membership on the Distribution of Federal Research Funding to Universities." *Economic Inquiry*, 41(2): 325–345.

Poterba, James M. 1994. "State Responses to Fiscal Crises: The Effects of Budgetary Institutions and Politics." *Journal of Political Economy*, 102(4): 799–821.

Roer, Elizabeth A. 2016. "Instant Gratification, Persistent Pain: The Employment Effects of Sequester-Induced Federal Procurement Cuts." *Working Paper*.

Roer, Elizabeth A., and Wayne Sandholtz. 2017. "Do Voters Punish Politicians for Lost Federal Procurement Spending?" *Working Paper*.

Rundquist, Barry, Jeong-Hwa Lee, and Jungho Rhee. 1996. "The Distributive Politics of Cold War Defense Spending: Some State Level Evidence." *Legislative Studies Quarterly*, 21(2): 265–281.

Shadbegian, Ronald J. 1998. "Do Tax and Expenditure Limitations Affect Local Government Budgets? Evidence From Panel Data." *Public Finance Review*, 26(2): 118–136.

Shadbegian, Ronald J. 1999. "The Effect of Tax and Expenditure Limitations on the Revenue Structure of Local Government, 1962-87." *National Tax Journal*, 52(2): 221–237.

Skidmore, Mark. 1999. "Tax and Expenditure Limitations and the Fiscal Relationships between State and Local Governments." *Public Choice*, 99(1): 77–102.

Snyder, Jason. 2005. "Detecting Manipulation in U.S. House Elections." *Working Paper*.

Stein, Robert M., and Kenneth N. Bickers. 1994. "Congressional Elections and the Pork Barrel." *Journal of Politics*, 56(2): 377–399.

Strömberg, David. 2004. "Radio's Impact on Public Spending." *Quarterly Journal of Economics*, 119(1): 189–221.

Tahoun, Ahmed. 2014. "The role of stock ownership by US members of Congress on the market for political favors." *Journal of Financial Economics*, 111(2014): 86–110.

Thistlethwaite, Donald L., and Donald T. Campbell. 1960. "Regression-Discontinuity Analysis: An Alternative to the Ex Post Facto Experiment." *Journal Educational Psychology*, 51(6): 309–317.