

The Effects of Earmarks on the Likelihood of Reelection

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Abstract

Both academic and popular sources claim that incumbent legislators use government spending—“pork-barrel” spending—to win over voters. To date, however, evidence for this hypothesis is scarce. Using recently available data on the sponsorship of earmarks in U.S. appropriations legislation, this paper tests the effect of earmarks on the likelihood of reelection of U.S. Representatives. The results show that secured earmarks lead to higher vote shares. Furthermore, using alternative definitions for what an incumbent’s constituency might count as “his earmarks”, I show that the effect of earmarks on vote shares is larger when they are directed to the incumbent’s state. Finally, voters care about the amount of earmarks, not whether earmarks have few or many sponsors.

Introduction

Though standard models in both economics and political science support the hypothesis that incumbents increase their chances of reelection through pork-barrel spending (Weingast 1979, Shepsle and Weingast 1981, Weingast, Shepsle, and Johnsen 1981, Niou and Ordeshook 1985, Ferejohn and Krehbiel 1987, Inman 1988, and Inman and Fitts 1990, Bickers and Stein 1996, Shepsle, Dickson, and Van Houweling 2002, Keefer and Khemani 2009), there is surprisingly little evidence that delivering federal funds to home districts helps legislators to get reelected. This is surprising because securing federal funds for projects and activities that benefit the local constituency appears to be one avenue to achieve the objective of maintaining one's seat in the legislature. Nonetheless, evidence that delivering federal funds to home districts is an effective means to increase the chances of reelection has been elusive, even though members of Congress themselves believe that their reelection is likely determined by their success in obtaining federal funds for their districts (Mayhew 1974).

Two studies (Levitt and Snyder, 1997; Stein and Bickers, 1994) find some evidence that securing federal resources for constituents helps incumbents' electoral prospects. Levitt and Snyder (1997) find a positive relationship between federal funds to congressional districts and incumbents' vote shares in the general election; an increase in per capita spending of \$100 increases an incumbent's vote share by two percentage points. Stein and Bickers (1994) suggest that voters view incumbents more favorably when voters are aware that the incumbent successfully sought funds for the district. But they lack evidence indicating whether the funds actually increase incumbents' chances of reelection. These important contributions, using total federal spending as well as particular discretionary spending categories (such as data from the Federal Assistance Award Data System) as a measure for how successful an incumbent has been

in securing pork barrel spending, share a common drawback. The data used in these studies lack the ability to associate the incumbent running for reelection with the federal spending the incumbent secured in his or her district. Much of the federal expenditure flowing to congressional districts occurs without a particular legislator's direct action, because, for example, grants go to districts through the application of distribution formulas (Lee 2003).

This raises a concern regarding the existing studies because the measure used for examining the effect of federal spending is not the measure voters would use if they would want to reward an incumbent for spending that he or she brought to their district. This may explain why there is little evidence that pork barrel spending helps incumbents: voters may reward incumbents for the additional spending that they secured, but not for federal spending that they cannot claim is their achievement.

For voters to reward incumbents for federal spending in the district, voters require knowledge of the amount of federal spending in their district to attribute to the incumbent. Earmarked projects offer members of the House a method by which they can direct funds to their constituents without additional intermediation, as earmarks specify the geographical area of the funds' distribution. If voters reward incumbents for funds that the incumbents themselves acquire for the district—rather than federal funds generally—House members have a strong incentive to create earmarks for district-specific projects, since such action allows incumbents to claim credit (Mayhew 1974). Thus, as House members cannot credibly claim credit for most spending flowing to their districts (Lee 2003), representatives' best credit-claiming opportunities lie in earmarked projects.

In this study I examine the effects of earmarks sponsored by House members on the likelihood of the sponsor's reelection. Previous studies could not conduct such an examination

because it was impossible to identify the legislator responsible for the insertion of a particular earmark into a bill. However, in January of 2007 the U.S. House of Representatives passed new disclosure rules, requiring disclosure of earmark sponsors' identities. With this change in disclosure rules, data are available to examine whether sponsored earmarks are a determinant of the electoral success of incumbents.

Theoretical models lend support for the hypothesis that earmarked funds increase the probability of reelection. Testing for this relation between earmarks and votes received for reelection, however, faces an obvious obstacle: legislators who are (or expect to be) in very competitive races may exert extra effort to secure earmarks, improving their prospects and avoiding defeat. Thus incumbents in tight races may secure more federal spending than those facing less challenging electoral prospects, leading to a negative correlation between earmarks and the likelihood of election, and biasing the estimated coefficient on earmarks downward. I will address this issue using the malapportionment in the U.S. Senate as an instrument for earmarks.

Malapportionment in the U.S. Senate leads to an overrepresentation of small states in the Senate, but not in the U.S. House, where each member represents roughly the same number of people. The number of earmarks a House member can secure for his district is determined in part by whether a U.S. Senator from their state will support the earmark. Due to Senate malapportionment, there is a small state bias that benefits the House members from those states. The bias makes it more likely that their proposed earmarks are included in the final bill, as any final appropriations bill goes through a conference committee where both Senators and Representatives partake and make final decisions on which earmarks to include and to exclude.

Thus influence of Senators, stemming from unequal representation, influences whether House members have their sponsored earmarks included in the passed legislation.

Assuming the unequal proportional representation instrument is valid, it generates unbiased estimates with respect to the effect of earmarks on incumbents' vote shares. Results show that earmark spending increases incumbents' chances of election, and the productivity of earmarks with respect to generating votes for incumbents is greater, the more voters can attribute spending to their incumbent, and the more spending is targeted to the incumbent's congressional district.

II. Earmarks – Institutions

Earmarks are provisions that lawmakers insert into larger bills.¹ Earmarks allocate funds for specific projects and are sometimes referred to as “pork” or “pork-barrel spending”. While just a small part of the overall budget, the number and value of earmarks has been strongly growing over the past decade. Earmarks have become increasingly important in the appropriations process. The number of earmarks in appropriations bills increased from around 1,500 in the mid-1990s to about 14,000 in 2005.²

In part due to the increase in earmarks, and in part due to some ethics scandals in Congress, early in 2007 the House adopted institutional earmark reform rules (H. Res. 6) that included disclosure requirements for earmark sponsorship.³ This adoption of the House Resolution corresponded to a reduction of earmarks to near their 1990s levels (about 2,000) in

¹ For a narrative account of the rise of the modern earmark see “Inventing the Earmark” (Washington Post, April 5, 2007).

² http://www.cagw.org/site/PageServer?pagename=reports_porkbarrelreport#trends – accessed May 18, 2009

³ Scandals included the criminal conviction of Jack Abramoff, a lobbyist, several congressional and federal agency staff, and Rep. Bob Ney (OH).

fiscal year 2007⁴, but the number increased back to over 11,000 in fiscal year 2008. Prior to 2007, there was no requirement that legislator publicly disclose that they sponsored earmarks.

The economics of concentrated benefits and disbursed costs predicts an oversupply of earmarks, because earmarks are geographically concentrated, while the cost is borne by all taxpayers in the country. This issue has been extensively discussed in the economics and political science literature. Earmarks are subject to the common pool problem (Weingast 1979, Shepsle and Weingast 1981, Weingast, Shepsle, and Johnsen 1981, Niou and Ordeshook 1985, Ferejohn and Krehbiel 1987, Inman 1988, and Inman and Fitts 1990, Bickers and Stein 1996, Shepsle, Dickson, and Van Houweling 2002, Baqir 2002). As Weingast (1979, 254-5) explains, “legislators will still continue to propose projects... since each district bears only one *N*th of the costs of its own projects”. Because each constituency receives the full benefit of its district’s projects, while paying only a small share of the projects’ costs, legislators have an incentive to oversupply earmarks.

While earmarks are oversupplied from a cost-benefit calculation perspective, the productivity of earmark dollars may not be as high as projects which are determined by other processes, as for example agency review. Some observers suggest that earmarks tend to be projects that would otherwise be relatively low priority projects. For example, the Department of Transportation Inspector General issued a report stating that “many earmarked projects considered by the agencies as low priority are being funded over higher priority, non-earmarked projects.”⁵ The same study found that nearly 99 percent of all earmarked projects “were not

⁴ In early 2007, for Fiscal Year 2007 appropriations, there was also a moratorium for earmarks in place that applied to all appropriation bills.

⁵ Department of Transportation OIG Report Number AV-2007-066, “Review of Congress Earmarks Within Department of Transportation Funds.” September 7, 2007.

subject to the agencies' review and selection processes," bypassing the agency's normal review process.

III. Previous literature

A. Determinants of earmarks

A large part of the literature on determinants of federal funds and earmarks examines the importance of legislator characteristics and institutions in determining earmarks. Studies have found that seniority and committee membership are important determinants for explaining the earmarks secured by U.S. House Representatives (see for example Lee 2003, Lauderdale 2008). Another determinant of earmark spending is the influence of legislators. Payne (2003), for example, finds that universities with more powerful representatives in Congress receive more federal research funding. The allocation of earmarks is also subject to partisan bias. Specifically, Balla et al (2002) show that majority party members receive more valuable earmarks, i.e. earmarks that are allocated over a longer time period.⁶

Some papers have noticed a relation between federal spending and the malapportionment in the U.S. Senate. Malapportionment occurs because in the United States, each state's Senate delegation is fixed at two Senators even though states differ in population size. For example, while the state with the largest population (California) has a larger population than the smallest population state (Wyoming) by a factor of roughly 70, both states have the same number of Senators.⁷ States' House delegations, however, are roughly proportional with the state

⁶ Specifically, they find that the interaction of House majority party and the lag of earmarks is positive and statistically significant in the earmark equation.

⁷ The difference in malapportionment in the House, while still present, is significantly less dramatic: California has 53 seats in the House of Representatives, to Wyoming's single representative.

population, and delegation sizes are adjusted every ten years after the population count through the decennial census.

Malapportionment in the Senate has important consequences for the distribution of federal spending. Atlas et al (1995) analyze data between 1972 and 1990 and find that per capita representation in the U.S. Senate is positively correlated with aggregate per capita federal spending and spending categories, such as defense and entitlements. Ansolabehere, Snyder and Ting (2003) study the issue in a bargaining model in a bicameral legislature where there is malapportionment in one of the chambers, such as the U.S. Senate. Their theoretical model predicts that small states receive larger transfers than bigger states. In an examination of the House and Senate versions of the 2005 Highway bill, Hauk and Wacziarg (2007) find that the House version did not disproportionately allocate transportation funds to smaller states. Rather, only after the House bill passed through the conference committee did they observe disproportionate geographic allocation. This finding provides evidence that it is legislative malapportionment in the Senate and not factors in the House that result in a small state bias.

Knight (2008) builds a theoretical model that sheds light on the channels through which smaller states have an advantage in the U.S. Senate. He identifies two important channels by which small states gain power in the Senate: the “proposal-power channel” (small states are more likely to have seats in the Appropriations Committee) and the “vote-yield channel” (small states have lower tax liabilities, and are thus better coalition partners). His findings support the hypothesis that smaller states receive more federal funds because they have disproportionate bargaining power in the U.S. Senate.

Some research examines discretionary funding and its determinants in other countries' legislatures. Evans (2005) finds that in Canada, consistent with the U.S. experience, low-population electoral districts receive higher spending and pay lower taxes per capita.

B. Earmarks and Electoral Success

There are several papers that have found incumbents can “buy support” with federal spending. Levitt and Snyder (1997) find that an additional \$100 per capita in non-transfer federal district-level spending results in a two-percent vote increase for incumbents. Stein and Bickers (1994) find that when voters are aware of new awards to the district, they evaluate the incumbent more favorably. Also, they find that the most vulnerable incumbents are most likely to seek awards, which emphasizes the point that the causation does not go only from more earmarks to electoral strength, but also from anticipated strength or weakness to earmarks. Dahlberg and Johansson (2002) uncover evidence of strategic grant distribution in Sweden; the incumbent party directs more grants to marginal or “swing” districts, and these grants do increase the incumbent party's vote share. And Martin (2008) demonstrates that incumbent congressmen rationally allocate resources to those areas that are most likely to vote, as measured by past voter turnout.

For India, Saumik and Denzau (2006) examine public good provision to local districts, and find that incumbents are rewarded by voters for the provision of some public goods like electricity, but not others like safe drinking water. Evidence from Australia suggests that districts held by the governing coalition receive a larger share of discretionary funding, and that funding does not go to more marginal districts (Leigh 2008). Samuels (2002), in contrast, argues that Brazilian legislators distribute pork not to buy votes directly, but rather trade pork for campaign contributions, which they subsequently employ to acquire votes. Examination of

Spain's intergovernmental transfers by Sole-Olle and Sorribas-Navarro (2008) indicates that grants to a jurisdiction aligned with a legislator's party yield votes to the grantor, but grants to the opposition party's area (i.e., where the local government is in the control of the opposition) yield no benefit. They interpret this as evidence of the local opposition claiming some of the credit for the expenditure. However, with the exception of Levitt and Snyder (1997) these works do not address the potential endogeneity bias stemming from the likely case that spending is correlated with the error term in the voting equation.

IV. Research design

A. Data and Disclosure rules.

The fiscal year 2008 went from October 1, 2007 to September 30, 2008. On December 19, 2007 Congress passed an omnibus appropriations bill combining 11 unfinished 2008 appropriations bills. This was the first Omnibus bill for which disclosure for earmarks was required. The appropriation bills passed in early 2007 were passed with a moratorium on earmarks in place.

From October 1, 2008 onwards, the beginning of the 2009 fiscal year, all agencies operated under a continuing resolution. This continuing measure passed the House on September 24 by a vote of 370-58, then was approved by the Senate three days later by a vote of 78-12. It was signed by the president on September 30 as Public Law 110-329. At the end of 2008, Congress approved fiscal year 2009 appropriations for the departments of Defense, Homeland Security and Veterans Affairs, as well as military construction programs. However, Congress did not approve final appropriations for the other departments. These departments were funded through the continuing resolution. The omnibus appropriations bill for fiscal year 2009 for these other departments was passed on January 2009.

This paper studies earmarks in seven Fiscal Year 2008 congressional appropriations bills, passed in December 2007, and also earmarks in the appropriations bills for Fiscal Year 2009 that Congress passed in the September before the 2008 election.

The appropriations bills in both fiscal years contained earmarks. The House version of the bill contains proposed earmarks by U.S. Representatives, and the Senate version contains earmarks proposed by U.S. Senators. There may be some overlap in the earmarks proposed in both chambers. House and Senate separately pass their own version of the appropriations bills. After that, both bills go to the conference committee where they are amended further. In the conference committee Senators, as well as Representatives, have influence on which earmarks are cut or added in the final bill.

The earmark data are compiled by the Taxpayers for Common Sense.⁸ The earmark data identify the sponsoring chamber, the identity of the sponsor, and whether the earmark was included in the final bill. Given the recent disclosure requirement, no data on sponsorship exist prior to the bills passed in late 2007.

B. Specification and Causality issues

To test the hypothesis that earmarks influence the percentage of votes incumbents receive in the 2008 general election, I estimate the specification

$$(\text{Incumbent Election Percentage})_i = \beta_1 + \beta_2 \text{Earmarks}_i + \beta_3 \mathbf{X}_i + \varepsilon_i \quad (1)$$

where earmarks are the natural log of the dollar value of total earmarks by a Representative, and \mathbf{X}_i is a matrix of explanatory variables. The vector \mathbf{X}_i includes a dummy variable for the incumbent's party affiliation (Democrat), and the partisan makeup, measured as the incumbent's share of the two-party vote in 2006, with a quadratic term to capture nonlinearities. The party

⁸ <http://www.taxpayers.org>

affiliation variable captures the effect of being a member of the majority party, which has much agenda setting control. Thus members of the majority party may be more successful in securing earmarks.

The X_i vector of controls also includes the “coattail effect”, measured as President Barack Obama’s share of the two-party vote in the 2008 general election. This variable controls for the possibility that Democratic Party candidates have an advantage at the polls because they are from the same party as the winner of the presidential race. To allow for a differential coattail effect when the incumbent is a Republican as opposed to a Democrat, I also include an interaction term between Obama’s vote share and the indicator variable whether an incumbent is a Democrat. Another control variable is incumbents’ seniority, since more senior Representatives have more influence in Congress and are thus in an advantaged position to secure earmarks for their districts.

I also include challenger experience as a control, measured as an indicator variable for whether the challenger has held an elective office. Finally, depending on the specification, I include one of two measures of the competitiveness of the campaign. One measure is the incumbent’s fundraising advantage, computed as the percent by which the incumbent outspends the challenger, i.e. ratio of the difference between incumbent and challenger campaign contributions to incumbent campaign contributions. The other measure of competitiveness is an indicator for whether the incumbent is unopposed.

There is a rich literature on many of these control variables, particularly challenger experience and campaign spending (Jacobson 1978; and Green and Krasno 1988, provide the seminal discussions). Challenger experience, measured by whether the challenger has held elected office, is often used as a measure of challenger quality in regressions examining the

effect of campaign spending on incumbent vote shares. Further, arguably campaign spending is endogenous in vote share equations since unobserved incumbent quality, for example, is correlated with campaign spending and directly influences his or her vote share. Since the focus of this paper is on the effects of pork-barrel spending, I will run specifications with and without campaign spending to examine whether the results are robust with respect to the inclusion of campaign spending.⁹

Earmarks may signal electoral weakness, as incumbents will respond to diminished electoral prospects by increasing the number of earmarks. If legislators who expect a tight race exert extra effort to secure earmarks, the point estimate on earmarks in the reelection equation is biased downward. To address this bias I use malapportionment in the U.S. Senate as an instrument for earmarks. In the U.S. Senate representation is malapportioned because each state, regardless of population size, has two Senators representing it in the upper chamber, and each Senator has one vote on the Senate floor. This gives smaller states disproportionate influence relative to their population, and studies have documented that states with smaller populations receive more funds per capita.¹⁰

Senators exert their influence on the final bill in the conference committee. This committee has as its members both Representatives and Senators, and can delete or add some of the earmarks in the initial bills passed by the House and the Senate (Knight 2008, Haug and Wacziarg 2007).

⁹ See Jacobson (1978), Green and Krasno (1988), Abramowitz (1988), Thomas (1989), Gerber (1998), and Erikson & Palfrey (2000) for a better understanding of the endogeneity of campaign spending and the difficulty of capturing candidate quality.

¹⁰ Although studies cited in the literature review have found that seniority and committee membership are important determinants of earmarks, I will not use the power of a congressman as an instrument, since power may not fulfill one of the conditions of valid instruments; specifically, power may not be correlated with the number of votes received in the general election.

Haug and Wacziarg (2007) examine the version passed by the House and the compromise version passed in the conference committee. They find that their measure of state size, the log of population, has no explanatory power for the earmarks contained in the House version of the Bill, but has strong explanatory power in the equation explaining the conference version; the log of population is negatively correlated with the latter earmarks, lending support to the small state bias hypothesis.

In this study I examine the effect of the final amount, not the requested amount, flowing to congressional district conditional on a House member requesting the funds. Requested funds differ from the final amount because Senators are influential in the conference committee and change the requested amount. Malapportionment changes the final amount leading to fewer funds per capita to larger states.

For unequal representation of states in the U.S. Senate to be a valid instrument, it is important that the re-election prospects of individual incumbents in the U.S. House of Representatives are uncorrelated with the population sizes of their states. There is not, to my knowledge, any evidence to suggest that the size of the state population impacts election outcomes in the individual House districts of that state. Indeed, while there is considerable investigation into the effect that a state's size has on incumbent Senators (see Oppenheimer 1996, Lee and Oppenheimer 1997, Ladewig and Jasinski 2008, and below), to my knowledge no model suggests that in House elections state population is a determinant of vote share.

Examining vote shares for U.S. Senators, Hibbing and Brandes (1983) first empirically analyzed the role of the size of a state's population for Senators' re-election prospects and find that "other things being equal, Senators from populous states like New York and California can expect to average about 6 to 7 percentage points fewer than senators from lightly populated

states like Delaware, North Dakota, and Vermont” (Hibbing and Brandes, pp. 817). Abramowitz (1988) explains that “as population size increases, so does political and economic diversity; in addition, the size of a state’s population should be inversely related to personal contacts with voters” (Abramowitz, pp. 387). And Gerber (1998) analyzes the effect of campaign spending on vote share in Senate races and employs state population as an instrument for campaign spending.

Precisely because there is almost no variation in the size of House districts created by Article I of the U.S. Constitution and its subsequent interpretation in the twentieth century¹¹, none of the theoretical reasons used to justify estimating Senate vote share as a function of state population apply for House races. Lacking justification, it is thus not surprising that estimation of House election vote shares in past research contains neither state nor district population size as an explanatory variable.

V. Results

Table 1 reports means and standard deviation of the data used in this analysis. Incumbent’s vote shares in 2008 vary between 40 percent and 100 percent with an average incumbent winning with 68 percent of the vote. The number of observations is 380, which is lower than the 435 members of the U.S. House of Representatives because some incumbents did not run for reelection and others entered the House midway between 2007 and 2008 due to retirements or deaths of sitting members. I excluded those entering mid-year because they did not have the opportunity to secure as many earmarks as other members, and because we do not have the vote

¹¹ See *Wesberry v. Sanders* (376 U.S. 1) and *Baker v. Carr* (369 U.S. 186) for the interpretation leading to the doctrine of “one person, one vote” and the Constitutional questions therein.

share they received in the 2006 election, the latter being one of the control variables in the regression analysis.¹²

The data show that U.S. House members secured on average \$48 million in earmarks in the fiscal year 2008 omnibus bill, though there is substantial variation in this amount. At the low end of the distribution is Rep. Tiberi of Ohio, who obtained \$900,000 in earmarks. At the upper end of the distribution is Rep. Berkley of Nevada, who obtained \$390 million in earmarks. Adding the earmarks from the September 2008 Appropriations bill for FY 2009 increases the average dollar amount of the earmarks to \$84 million per Representative. Of incumbents up for reelection in 2008, about 14 percent ran in uncontested races. And of all incumbents running for reelection, about 14 percent faced a challenger who previously held elected office.¹³

The earmark amount appropriated in the final bill, after having gone through the conference, was on average about \$450,000 lower per Representative than the amount requested in the House. I correlated the difference between final amount and requested amount with state population and found that the difference between the final amount appropriated and the amount requested is smaller in less populous states. This simple correlation presents initial evidence of malapportionment's role in allocating funding. Representatives from smaller states—those that benefit from malapportionment—lose less (or gain more) relative to congressmen from larger states in conference committees, where the effect of the Senate's equal representation of states manifests.

¹² While all members of the House of Representatives stand for election, even for those who attain their seats mid-session, it is reasonable to assume that those special elections do not occur under the same national political climate as the rest of the races held during election season, and the percent of the vote they receive in those special elections measures something different than the 2006 vote share.

¹³ I would like to thank Gary Jacobson for providing data to me on whether the challenger held previously elected office and whether the incumbent was unopposed.

Table 2 shows the OLS results without addressing the causality issue. The first two columns differ from columns three and four in that the latter two specifications include an indicator for whether an unopposed incumbent is seeking reelection. While these first four columns employ the entire sample, columns five and six in Table 2 exclude unopposed incumbents. This latter specification is motivated by the fact that regardless of whether earmarks increase or decrease an incumbent's vote share, earmarks cannot affect the vote share of unopposed incumbents.¹⁴ Finally, I estimate each specification once with and once without the incumbent fundraising advantage, since fundraising and thus campaign spending is likely endogenous in these equations.

In Table 2, the point estimates in all specifications indicate the effect of earmarks on vote shares is not statistically significant; and contrary to the predicted positive effect, the earmark coefficient is negative in the first two specifications. These results suggest that incumbents' successful efforts to obtain earmarks are not effective for increasing their vote shares. However, as previously indicated, the point estimates on earmarks have a downward bias.

The point estimates on the control variable in Table 2 are consistent with the predictions. The coefficient on Obama's share of the presidential vote and of "Democrat*Obama" is intuitive; larger district vote shares for Obama are associated with higher votes shares for Democratic incumbents and lower vote shares for Republican incumbents. This is because the vote share for Obama is a measure for the underlying party preferences of voters in the district. A one percentage point increase in Obama's vote share increases a Democrat incumbent's vote share between 0.2 and 0.4 percentage points.

¹⁴ Excluding unopposed incumbents from regressions is commonplace in the literature on the effect of campaign spending on vote shares, for similar reasons.

To evaluate the effect of being a Democrat on the vote share, the negative coefficient on the Democrat indicator has to be added to the interaction effect between being a Democrat and the percent of the popular vote received by Obama. The point estimate suggests that Democratic incumbents receive a higher vote share than Republican incumbents when Obama's vote share is higher than 42 percent in the congressional district.

In an alternative and unreported specification I excluded the Obama vote from the regression but kept an indicator for whether the incumbent was a Democrat in the regression equation. The result from this specification shows that the indicator variable for Democrats has a positive and statistically significant sign, indicating that Democratic incumbents receive, on average, three percentage points more than their Republican colleagues. In this alternative specification, the other variables in this regression had the same signs as the coefficients reported in Table 2, and were of similar magnitudes and significance levels.

The effect of seniority is negative in all specifications and statistically significant at the ten percent level in three of the six specifications. Further, the point estimate on the incumbent's fundraising advantage is positive and statistically significant. According to these estimates, an incumbent outspending her opponent by 10 percent increases her vote share by half a percentage point (Table 2, column 3). Finally, experienced challengers do better in elections; a challenger who has held previous elected office reduces incumbents' vote share by between 2 and 5 percentage points.

Table 3 presents first stage results from the Two Stage Least Square regressions. Here, the dependent variable is earmarks. As predicted by the malapportionment hypothesis, state population is negatively correlated with earmarks in each of the six specifications. In all specifications the point estimates on state population are negative and statistically significant at

the one percent level. The estimates suggest that a one-percent increase in state population is associated with a 0.2-percent decrease in earmarks. Among the control variables, seniority, a rough proxy for power and influence in the House, is positively correlated with earmarks and the point estimates on seniority are statistically significant, indicating that earmarks are an increasing function of a legislator's power and influence in Congress.

To test for overidentifying restrictions, I replace log population by population and its square. When doing so, the point estimate on population has a negative and the point estimate on its square is positive, which is consistent with the negative coefficients on log population in Table 3. In this alternative specification both population coefficients are jointly statistically significant at the five percent level. The overidentifying restrictions test has a p-value of 0.9, suggesting that the population instruments are valid.

Table 4 presents the second stage estimation results for fiscal year 2008 earmarks. The table is organized as Table 2. Relative to Table 2, in all six columns the point estimates on earmarks increase by more than an order of magnitude. This is consistent with the hypothesis that the estimates in the OLS specifications are biased downward.

The first two specifications in Table 4 do not control for the fact that earmarks cannot have an effect on the margin of victory of unopposed candidates.¹⁵ In the first of these two specifications the point estimate on earmarks is positive and statistically significant at the ten percent level. It is positive and not statistically significant in the second specification. In all other specifications in Table 4, columns 3 to 6, the point estimates on earmarks are positive and statistically significant at the five or one percent level. These specifications account for unopposed incumbents by either including an indicator variable for being unopposed (columns 3 and 4), or

¹⁵ However, there is the possibility that earmarks could be used to “scare off” challengers, just as incumbents may raise large war chests to deter challengers from entering a race.

by omitting unopposed incumbents for the sample (columns 5 and 6). Omitting unopposed incumbents is consistent with the methods of analysis used in the campaign expenditure literature, which examines the effect of campaign spending on incumbent's vote shares.

The point estimates on earmarks in Table 4 indicate that a 100-percent increase in earmarks leads to a between 4.1- and 5.7-percent increase in an incumbent's vote share. The estimates imply that, at the mean earmark amount (\$48 million), increasing an incumbent's earmarks by \$10 million increases an incumbent's vote share by about one percentage point.¹⁶

All control variables have the same signs as in Table 2. The magnitude of most point estimates increases slightly, with the exception of the point estimate on seniority, which increases three to four fold. All point estimates on the control variables have similar levels of statistical significance as in Table 2. One way of getting a sense of the importance of earmarks is to compare their effect to the effect of having a fundraising advantage. The estimates suggest that when accounting for unopposed incumbents (columns 3 and 5), a \$10 million increase in earmarks is roughly equivalent to the impact of maintaining a 20 percentage point fundraising advantage.

While the previous results showed that earmarks passed in December 2007, the first time earmark sponsorship had to be disclosed, have a positive influence on incumbents' vote shares in the 2008 election, it is also of interest to know whether the total of all earmarks passed in the 2007-2008 Congress influences vote shares. This is done in Table 5. Table 5 maintains the specifications in Table 4 but uses the natural log of the sum of earmarks secured by an incumbent for fiscal year 2008 and in fiscal year 2009 omnibus appropriations bill, passed in September 2008, instead of examining only earmarks in the bill for the 2008 fiscal year. The September 2008 appropriations bill represents the last opportunity congresspersons had prior to

¹⁶ This number comes from dividing the coefficients by the average amount of earmarks.

the general election to secure funding for their district. And while this funding could not be delivered prior to the election, it is nevertheless something for which the incumbent can take credit.

The findings for the sum of the earmarks over two fiscal years are similar to the findings in Table 4. After employing instrumental variables the coefficients on earmarks have a positive sign, are statistically significant, and economically (or perhaps, more appropriately, politically) meaningful.¹⁷ The point estimates suggest that a doubling of earmarks increases vote shares between 5 and 6.8 percentage points. These point estimates on earmarks are larger than those in Table 4. This suggests that the additional earmarks granted in 2008 but not yet spent have a higher marginal product in securing votes than the earmarks for (i.e., spent in) the 2008 fiscal year. This finding could be interpreted as constituencies rewarding recent successful earmark sponsoring of congressmen more highly than similar activity farther in the past.

Up to this point the measure of earmarks studied was the total dollar amount that a Representative sponsored and which was included in the final bill after the mark-up in the conference committee. So far, the earmark measure does not account for whether a Representative was the sole sponsor or one of several sponsors, and which geographic area was the beneficiary of the earmarks.

While over 90 percent of individual earmarks sponsored by incumbents go to locations in their home states, fewer of the actual dollars included in the final bill (about 80 percent) end up in the sponsor's home state. It may be that constituents give more credit for earmarks spent closer to home than those that go out-of-state. This is not to say that earmarks must be spent in a congressperson's state or district to benefit his or her constituents. For example, the \$212,000

¹⁷ As in Table 2, prior to correcting for bias through instrumental variables, the effect of earmarks on campaign spending is statistically insignificant and often signed opposite of theoretical prediction (results available upon request). The first stage estimates for the regression in Table 5 are very similar to the first stage estimates in Table 3.

that Rep. Mike Thompson (CA 1st) secured for Olive Fruit Fly research conducted in France is likely of considerable value to his constituents, the olive and grape growers of Napa Valley. It is possible, however, that his constituents would give him more credit were he to secure funding for such research in the district itself.

In addition to location considerations, it is also important to establish who deserves the credit for an earmark. While over 7,000 of the roughly 8,500 earmarks from fiscal year 2008 have only one sponsor, roughly 15 percent of earmarks are cosponsored. If an incumbent's constituents placed more weight on earmarks that he or she secured alone, we expect a larger coefficient on earmarks after accounting for cosponsorship.

Table 6 shows regression results when accounting for the geographic location and for multiple sponsorship of Fiscal Year 2008 earmarks.¹⁸ All results in Table 6 are estimated with two stage least squares and in each specification the first stage results are very similar to those in Table 3.¹⁹ The dependent variable in first two columns of Table 6 is the amount of sponsored earmarks included in the final bill that are going to the Representative's state.²⁰ The next two columns present results when adjusting earmarks for the number of sponsors. This is done by dividing each earmark dollar amount by the number of sponsors. The final two columns of Table 6 adjust for both the number of sponsors and whether the earmark is going into the state of the sponsoring Representative. All columns use specifications five and six of Table 4, which omits unopposed incumbents from the regression equations.

In Table 6, columns 1 and 2 the point estimates on earmarks have positive signs and are statistically significant. They show that a doubling of earmarks going into the state of the

¹⁸ Estimating these regressions for the sum of earmarks from fiscal year 2008 and earmarks passed in the September 2008 appropriations does not change the results presented in Table 6.

¹⁹ All unreported first stage results are available from the author upon request.

²⁰ The data source does not have the information whether earmarks go into the Representative's district, only whether they go into the Representative's state.

Representative's district lead to a between 6.9 and 7.5 percentage point increase in the polls. The corresponding estimates in Table 4 are 5.2 and 5.6 percentage points. The comparison of these numbers is not inconsistent with the hypothesis that voters reward incumbents more when earmarks are allocated to their home state as opposed to to another state. However, the 95 percent confidence intervals of the estimates in Table 4 and 6 overlap, so although the point estimates in Table 6 are larger than those in Table 4, not too strong conclusions regarding voter reward can be derived from these estimates.

Table 6 columns 3 and 4 accounts for co-sponsorship by weighting an incumbent's earmarks by the inverse of the number of sponsors. Again, the point estimates on earmarks are positive and statistically significant and thus results are consistent with the initial findings in Table 4. Sponsor-weighted earmarks have a statistically significant and economically meaningful impact on vote outcomes. It does not appear, however, that voters give greater weight to individually-secured earmarks. In fact, the point estimates on sponsorship-adjusted earmarks are about twenty percent smaller than those reported in Table 4 but the 95 percent confidence intervals between the coefficients in columns 3 and 4 in Table 6 and the corresponding coefficients in Table 4 overlap.

From comparing the estimates in the first two columns of Table 6 to the estimates to columns 3 and 4 of Table 6, it appears that voters care less about how many Representatives sponsored an earmark, but they care more about the amount of the earmark and whether the earmark is going to their home state. Finally, making adjustments both for an earmark's location and sponsor-weighting the totals (Table 6, columns 5 and 6) shows, as one may expect, that the effect of this measure of earmarks lies between the effects from the home-state adjusted earmark

measure (Table 6, columns 1 and 2) and the sponsorship-adjusted earmark measure (Table 6, columns 3 and 4).

VI. Conclusion

Based on the estimates in this paper, the average incumbent in 2008 receives an additional one percent of the popular vote from an increase in earmarks of about \$10 million (or about \$15 per capita given districts of 650,000 residents). This contrasts with the Levitt and Snyder (1997) estimate that an increase in federal spending of about \$50 million (\$100 per capita and approximately 500,000 people per district) increases the incumbent's vote share by 2 percentage points. The estimates presented in this paper suggest that, inasmuch as earmarked funds provide a better estimate of "pork barrel" spending than federal spending generally, and to the extent that Senate malapportionment is a valid instrument for the level of earmarked spending in a House district, past estimates of the effect of federal government spending on House races underestimate the impact of bringing home the bacon on reelection chances.

Congressmen regularly announce to their voters that they secured funding for their home district²¹ and often have their name, or picture²², or both on particular projects in the district that they had sponsored. Moreover, this paper shows that pork barrel spending increases the chances of election. Yet, if sponsored earmarks help reelection, why wasn't there disclosure of earmarks prior to 2007? Why were congressmen reluctant to disclose earmarks if their constituents benefit from them? It may be sponsorship of earmarks may help legislators attract campaign contributions and sponsorships may make this connection more apparent.²² Further, not all

²¹ For example in December 2009, Virginia Representative Connolly (VA 11) sent a six-page pamphlet to his constituencies which included a detailed list of federal projects he secured for his district.

²² There is some anecdotal evidence to support this interpretation; see "104 will get you \$300 Million" (*New York Times*, February 20, 2009) and "3 Linked to Lobby Firm See Donations Drop" (*Washington Post*, April 17, 2009).

sponsored earmarks are adopted in the final bill. Thus another possible explanation is that sponsorship makes failure to obtain an earmark more apparent, and also makes legislators' lack of success or efforts more transparent to their constituencies.

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Table 1

	Obs	Mean	Std. Dev.	Min	Max
Percent in 2008 general election	380	68.66	13.68	40.00	100.00
Earmarks in Fiscal Year 2008 omnibus, in millions	380	48.10	52.40	0.91	390.00
Earmarks in Fiscal Year 2008 omnibus+ September 2008 Appropriations, in millions	380	83.50	87.00	0.91	521.00
Log state population	380	16.10	0.89	13.34	17.42
Democrat=1, 0 otherwise	380	0.58	0.49	0	1
District vote for Obama	380	54.43	14.97	23.00	95.00
Log seniority	380	1.98	1.02	0.00	3.97
Percent in 2006 general election	380	67.97	13.48	45.60	100.00
Percent advantage of incumbent over challenger	380	0.78	0.40	-2.67	1.00
Previous elected office	380	0.14	0.35	0	1
Unopposed in 2008 general election	380	0.14	0.34	0	1
<u>Alternative Earmark Specifications</u>					
FY 2008 Earmarks in sponsor's state, in millions	380	40.10	46.80	0.91	372.00
FY 2008 Earmarks, sponsor-weighted, in millions	380	29.30	37.30	0.91	385.00
FY 2008 Earmarks in sponsor's state, sponsor-weighted, in millions	380	26.20	35.40	0.91	368.00
FY 2008 and Sept. 2009 Earmarks in sponsor's state, in millions	380	73.00	82.20	0.91	463.00
FY 2008 and Sept. 2009 Earmarks, sponsor-weighted, in millions	380	47.80	55.90	0.91	403.00
FY 2008 and Sept. 2009 Earmarks in sponsor's state, sponsor-weighted, in millions	380	44.10	53.70	0.91	387.00

Table 2
FY 2008 Earmarks and Percent received by incumbents in the 2008 General Election, OLS

	(1)	(2)	(3)	(4)	(5)	(6)
FY 2008 Earmarks	-0.340 (0.466)	-0.332 (0.484)	0.189 (0.263)	0.209 (0.279)	0.101 (0.220)	0.126 (0.239)
Democrat	-22.628*** (7.309)	-22.933*** (7.745)	-24.373*** (3.949)	-24.632*** (4.194)	-33.129*** (3.762)	-33.277*** (4.053)
Obama vote	-0.321*** (0.117)	-0.354*** (0.126)	-0.250*** (0.061)	-0.270*** (0.067)	-0.336*** (0.055)	-0.356*** (0.063)
Democrat*Obama vote	0.529*** (0.153)	0.552*** (0.163)	0.525*** (0.081)	0.541*** (0.087)	0.698*** (0.078)	0.712*** (0.085)
Log seniority	-0.754 (0.714)	-0.819 (0.742)	-0.737* (0.393)	-0.781* (0.419)	-0.647* (0.353)	-0.646* (0.375)
Vote in 2006 election	1.206** (0.471)	1.826*** (0.450)	1.757*** (0.285)	2.200*** (0.268)	1.634*** (0.290)	2.020*** (0.284)
Vote in 2006 election squared	-0.005* (0.003)	-0.009*** (0.003)	-0.010*** (0.002)	-0.012*** (0.002)	-0.009*** (0.002)	-0.011*** (0.002)
Fundraising advantage	7.275*** (1.725)		5.086*** (1.332)		4.373*** (1.061)	
Challenger has held elected office	-4.530*** (0.936)	-5.225*** (1.070)	-2.188*** (0.752)	-2.605*** (0.835)	-1.856** (0.744)	-2.196*** (0.826)
Incumbent unopposed			22.015*** (1.476)	22.612*** (1.521)		
Constant	25.595 (21.980)	7.843 (22.557)	-3.408 (12.622)	-16.461 (12.861)	6.745 (12.951)	-4.864 (13.624)
Observations						
R-squared	380	380	380	380	328	328

The dependent variable is the percent of the popular vote the incumbent received in the 2008 general election. Robust t statistics in parentheses; * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 3
First stage of TSLS estimates for FY 2008 Earmarks

	(1)	(2)	(3)	(4)	(5)	(6)
Log population	-0.195*** (0.059)	-0.195*** (0.059)	-0.198*** (0.058)	-0.197*** (0.058)	-0.190*** (0.064)	-0.189*** (0.064)
Democrat	0.775 (0.685)	0.775 (0.685)	0.790 (0.702)	0.788 (0.702)	0.319 (0.720)	0.317 (0.719)
Obama vote	0.001 (0.012)	0.001 (0.012)	-0.000 (0.013)	-0.000 (0.013)	-0.008 (0.012)	-0.008 (0.012)
Democrat*Obama vote	-0.005 (0.015)	-0.005 (0.015)	-0.005 (0.015)	-0.005 (0.015)	0.007 (0.015)	0.007 (0.015)
Log seniority	0.247*** (0.068)	0.247*** (0.068)	0.245*** (0.069)	0.245*** (0.069)	0.310*** (0.073)	0.311*** (0.073)
Vote in 2006 election	-0.048 (0.041)	-0.048 (0.041)	-0.054 (0.041)	-0.050 (0.040)	-0.070 (0.044)	-0.065 (0.042)
Vote in 2006 election squared	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Fundraising advantage	0.019 (0.114)	0.019 (0.114)	0.045 (0.114)		0.058 (0.113)	
Challenger has held elected office	-0.018 (0.147)	-0.018 (0.147)	-0.046 (0.148)	-0.050 (0.149)	-0.039 (0.151)	-0.043 (0.152)
Incumbent unopposed			-0.255 (0.166)	-0.249 (0.164)		
Constant	21.696*** (1.920)	21.696*** (1.920)	21.953*** (1.966)	21.836*** (1.934)	22.762*** (2.097)	22.602*** (2.054)
Observations						
R-squared	380	380	380	380	328	328

The dependent variable is the percent of the popular vote the incumbent received in the 2008 general election. Robust t statistics in parentheses; * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 4
FY 2008 Earmarks and Percent received by incumbents in the 2008 General Election, TSLS

	(1)	(2)	(3)	(4)	(5)	(6)
FY 2008 Earmarks	5.752* (3.397)	5.434 (3.505)	4.400** (1.983)	4.154** (2.022)	5.563** (2.272)	5.208** (2.269)
Democrat	-27.470*** (7.656)	-27.514*** (7.961)	-27.781*** (5.063)	-27.818*** (5.155)	-34.833*** (5.888)	-34.855*** (5.889)
Obama vote	-0.298*** (0.099)	-0.331*** (0.107)	-0.230*** (0.065)	-0.251*** (0.067)	-0.268*** (0.085)	-0.291*** (0.086)
Democrat*Obama vote	0.552*** (0.140)	0.573*** (0.147)	0.540*** (0.090)	0.555*** (0.092)	0.651*** (0.114)	0.667*** (0.115)
Log seniority	-2.273** (1.133)	-2.256* (1.163)	-1.780** (0.720)	-1.758** (0.739)	-2.341** (0.918)	-2.223** (0.909)
Vote in 2006 election	1.553*** (0.554)	2.149*** (0.517)	2.021*** (0.357)	2.436*** (0.332)	2.040*** (0.428)	2.380*** (0.399)
Vote in 2006 election squared	-0.007** (0.004)	-0.010*** (0.003)	-0.011*** (0.002)	-0.014*** (0.002)	-0.011*** (0.003)	-0.013*** (0.002)
Fundraising advantage	7.218*** (1.988)		4.947*** (1.520)		4.146*** (1.336)	
Challenger has held elected office	-4.628*** (1.254)	-5.313*** (1.282)	-2.148** (0.970)	-2.557*** (0.981)	-1.854* (1.079)	-2.177** (1.069)
Incumbent unopposed			23.021*** (1.617)	23.539*** (1.622)		
Constant	-90.808 (67.766)	-102.190 (69.263)	-84.738** (40.183)	-92.322** (40.873)	-103.073** (47.674)	-106.511** (47.164)
Observations	380	380	380	380	328	328
R-squared	0.364	0.351	0.738	0.733	0.472	0.486

Robust t statistics in parentheses; * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 5
FY 2008 and September 2008 Earmarks and Percent received by incumbents
in the 2008 General Election, TSLS

	(1)	(2)	(3)	(4)	(5)	(6)
FY 2008 & Sept. 2008 Earmarks	6.817 (4.233)	6.435 (4.367)	5.253** (2.528)	4.952* (2.581)	6.559** (2.922)	6.122** (2.916)
Democrat	-28.632*** (8.152)	-28.612*** (8.501)	-28.669*** (5.680)	-28.656*** (5.798)	-35.888*** (6.666)	-35.841*** (6.677)
Obama vote	-0.315*** (0.104)	-0.348*** (0.111)	-0.245*** (0.074)	-0.266*** (0.077)	-0.293*** (0.101)	-0.315*** (0.101)
Democrat*Obama Vote	0.549*** (0.143)	0.571*** (0.151)	0.539*** (0.098)	0.554*** (0.100)	0.647*** (0.128)	0.664*** (0.128)
Log seniority	-2.243* (1.183)	-2.228* (1.204)	-1.769** (0.758)	-1.746** (0.770)	-2.418** (1.017)	-2.289** (0.996)
Vote in 2006 election	1.641*** (0.614)	2.239*** (0.572)	2.077*** (0.413)	2.499*** (0.383)	2.054*** (0.502)	2.408*** (0.464)
Vote in 2006 election squared	-0.008* (0.004)	-0.011*** (0.004)	-0.012*** (0.003)	-0.014*** (0.002)	-0.011*** (0.003)	-0.013*** (0.003)
Fundraising advantage	7.312*** (2.087)		5.074*** (1.612)		4.346*** (1.510)	
Challenger has held elected office	-4.164*** (1.418)	-4.883*** (1.443)	-1.850* (1.121)	-2.286** (1.128)	-1.469 (1.265)	-1.832 (1.248)
Incumbent unopposed			22.468*** (1.700)	23.031*** (1.698)		
Constant	-114.417 (85.547)	-124.618 (87.352)	-103.07** (51.981)	-109.79** (52.642)	-122.71** (61.051)	-124.99** (60.174)
Observations	380	380	380	380	328	328
R-squared	0.285	0.280	0.677	0.678	0.313	0.346

Robust t statistics in parentheses; * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 6
FY 2008 Earmarks and Percent received by incumbents in the 2008 General Election, TSLs
Alternative Definitions of Earmarks

	<u>In-State</u>		<u>Per-Sponsor</u>		<u>In-State and Per-Sponsor</u>	
	(1)	(2)	(3)	(4)	(5)	(6)
FY 2008 Earmarks	7.445** (3.670)	6.953* (3.560)	4.488*** (1.548)	4.216*** (1.590)	5.397*** (2.044)	5.077** (2.065)
Democrat	-39.146*** (7.936)	-38.884*** (7.719)	-36.083*** (5.171)	-36.028*** (5.258)	-37.554*** (5.864)	-37.413*** (5.860)
Obama vote	-0.331*** (0.103)	-0.351*** (0.102)	-0.291*** (0.071)	-0.312*** (0.074)	-0.306*** (0.078)	-0.325*** (0.080)
Democrat*Obama vote	0.724*** (0.140)	0.736*** (0.138)	0.696*** (0.099)	0.708*** (0.102)	0.718*** (0.109)	0.729*** (0.110)
Log seniority	-2.644** (1.214)	-2.501** (1.178)	-1.892*** (0.649)	-1.806*** (0.656)	-2.035*** (0.744)	-1.943*** (0.745)
Vote in 2006 election	1.950*** (0.484)	2.307*** (0.452)	1.885*** (0.374)	2.217*** (0.339)	1.859*** (0.398)	2.184*** (0.360)
Vote in 2006 election Squared	-0.010*** (0.003)	-0.012*** (0.003)	-0.010*** (0.002)	-0.012*** (0.002)	-0.010*** (0.002)	-0.012*** (0.002)
Fundraising advantage	4.300*** (1.435)		3.921*** (1.456)		3.830** (1.499)	
Challenger has held elected office	-1.756 (1.332)	-2.097 (1.291)	-2.325** (0.948)	-2.604*** (0.966)	-2.463** (1.069)	-2.727** (1.071)
Constant	-127.596* (68.291)	-129.536* (66.386)	-75.533** (31.965)	-80.463** (32.261)	-88.283** (39.161)	-92.351** (39.092)
Observations	328	328	328	328	328	328
R-squared	0.211	0.258	0.610	0.609	0.527	0.536

Robust t statistics in parentheses; * significant at 10%; ** significant at 5%; *** significant at 1%.