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Abstract: There is considerable variation across members of the United States House of Representatives with respect to the number of bills they co-sponsor each legislative cycle. But we have little understanding of what motivates bill co-sponsorship activity. It seems unlikely that prospective campaign contributors to a specific legislator reward his/her bill co-sponsorship activity *per se*, as it merely contributes to the productivity of some other member(s) of the legislature. We develop a two-stage least squares (2SLS) model to examine the impact of the number of bills co-sponsored by members of the U.S. House of Representatives on campaign contributions received by those individuals over the time period 2000-2008. Bill co-sponsorship has a large and positive effect on campaign contributions through bill sponsorship.

Does Bill Co-sponsorship Affect Campaign Contributions?: Evidence from the U.S. House of Representatives, 2000-2008

"Gaining co-sponsors is an important part of the legislative process. Bills with co-sponsors are more likely to be passed from committee to a floor vote".

- CongressionalAid (2006)

Introduction

Over the period 2000 – 2008, U.S. congressmen sponsored, on average, 18 bills per 2-year congressional cycle while co-sponsoring an average of 112 bills. Every House member co-sponsored bills; the minimum was 4, the maximum was 425. While there is a relatively tight distribution around the mean number of bills sponsored, there is a wide spread, especially above the mean, with respect to the number of bills co-sponsored (Figure 1). A sizable number of House members co-sponsored large numbers of bills. No doubt, it is considerably more costly for a given legislator to produce a sponsored bill than to add his/her name onto an already-sponsored bill. So we might reasonably expect the returns to bill sponsorship to exceed the returns to bill co-sponsorship. But both the sheer volume of bill co-sponsorship activity and the extent of participation by House members suggest that this behavior is valuable to politicians. It is simply inconceivable that numerous incumbent House members engage in the level of bill co-sponsorship indicated by the readily-available data if there is no return from doing so. Yet, to our knowledge, no one has documented the aggregate impact of congressional bill co-sponsorship activity on campaign contributions.

Figure 1 about here

In this paper, we take a first step in filling this gap in the literature. It seems unlikely, in our opinion, that constituents and/or prospective campaign contributors reward bill co-

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sponsorship *per se*.   Why reward a politician for increasing the legislative productivity of someone else when you could reward that someone else directly? We argue that what really matters to prospective campaign contributors is bill sponsorship, but that a critical aspect of bill sponsorship is political support in the form of formal co-sponsorship by other members of the legislature. That is, bill co-sponsorship has an indirect effect on campaign contributions, not a direct effect. We develop a two-stage model in which past bill co-sponsorship affects current campaign contributions through a congressman's current bill sponsorship activity. We present evidence that lagged values of bill co-sponsorship generate exogenous variation necessary to identify the effect of bill sponsorship on campaign contributions. We test our model using data from the $107^{th} - 110^{th}$ Congresses and report statistically significant evidence of a sizable positive impact of bill co-sponsorship on campaign contributions.

Background

Much empirical analysis of the legislative process focuses on determinants of, and payoffs to, roll call voting although this activity occurs on only a small fraction of the bills that are written (Highton and Rocca 2005).[1] Most introduced bills are never voted on - - they die in committee, are withdrawn, etc. Despite the fact that some bills may be merged or become riders on other bills, it is undeniable that many bills do not come up for a floor vote, let alone pass and therefore go largely unnoticed and unstudied. Wilson and Young (1997) report a passage rate of less than 10% of all bills introduced into the U.S. Senate. Thomas and Grofmann (1993) report similar passage rates in the U.S. House of Representatives.

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[1] In the 109th Congress (from 2005-2006) there were 6,436 bills introduced in the U.S. Senate and House of Representatives, but only 316 bills were passed by both chambers and signed by the President to become law. http://giffords.house.gov/services/government-information/congress-faq/index.shtml).

Two other integral legislative activities that precede final voting, sponsorship and co-sponsorship of bills, have received much less attention in the literature.[2] In particular, the incentive for members of congress to engage in bill co-sponsorship is not well understood (Campbell 1982; Kessler and Krehbeil 1996; Wilson and Young 1993).

Yet if sponsoring and co-sponsoring bills are important to the legislative process, then a traceable connection likely exists between legislative payoffs (in terms of campaign contributions and/or electoral success) and congressional bill sponsorship and co-sponsorship activity. With respect to bill sponsorship, Rocca and Gordon (2010) confirm this linkage, finding that congressmen are rewarded for sponsorship activity in the form of campaign contributions[3]. However, no clear relationship between bill sponsorship and electoral margin has been established (Campbell 1982; Kessler and Krehbiel 1996; Krehbeil 1995; Wilson and Young 1993). Tanger and Laband (2009) reported that co-sponsorship in the U.S. Senate of a specific bill (S.B. 402 in 2007) that altered the tax treatment of timberlands was positively related to the level of campaign contributions received from forestry-related PACs and individuals. In the small, this suggests that bill co-sponsorship has a payoff in the form of campaign contributions. However, to our knowledge, the relationship between aggregate patterns of bill co-sponsorship and campaign contributions has not received any empirical exploration whatsoever.

We approached this gap in the literature by using data from the U.S. House of Representatives for the 107th-110th U.S. Congresses (2001-2008) to estimate a 'standard' model of the determinants of campaign contributions. The dependent variable is the log of total

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[2] We were able to find fewer than thirty articles on the subject of co-sponsorship.

[3] The authors examine sponsorship of bills focused on two specific interest areas (gun control and labor) and determine if a yes/no sponsorship decision on the bills correlated with campaign contributions. Their empirical analysis was confined to the 103rd and 104th congresses (1994-95 and 1996-97).

campaign contributions received in each 2-year campaign cycle. Explanatory variables include the number of bills sponsored by the individual, the number of bills co-sponsored by the individual, the amount of money spent by the individual's principal challenger in the last election, whether the individual was a member of the majority party in the election cycle under consideration, the percentage of the vote received by the individual in the most recent general election, the individual's age, the individual's seniority, whether or not the individual chaired a committee during the election cycle under consideration, the individual's rating by Americans for Democratic Action (a commonly-used 'thermometer' indicator of how liberal/conservative the individual is), and fixed effect dummy variables for the different congressional cycles (to capture temporal effects).

Table 1 about here

Table 1 shows variable definitions, sample statistics for our data and regression coefficients for our OLS model of the determinants of campaign contributions. In most respects, the coefficient estimates are statistically significant and believable. At the sample means for the explanatory variables, a congressman's campaign contributions increased with the number of bills (s)he sponsors, the amount of money spent by his/her principal opponent in the most recent election, if (s)he chaired a committee, and if (s)he was a member of the majority party. Campaign contributions declined as the percent of vote received by the individual in the most recent election increased (i.e., money flows to contested elections rather than blow-outs by the incumbent). Other things equal, older congressmen received less money than younger congressmen - - which is consistent with the notion of contributions as a long-term investment (Snyder 1990;1992). The one finding that is singularly surprising is the negative and highly significant coefficient estimate on the number of bills co-sponsored, indicating that, on the

margin, (financial) returns to bill co-sponsorship are negative. Moreover, as we report in Table 2, the average number of bills co-sponsored by the House members who started as freshmen in January 2001 _increased_ during each of the four Congresses they served in (i.e., through 2008).

Table 2 about here

From our perspective, these findings, taken together, simply are not credible. That is, it is inconceivable that members of Congress systematically engage in (an increasing amount of) behavior that has a negative payoff. We can see no reason why prospective contributors to a congressman's election campaign would withhold contributions because (s)he co-sponsors more bills than the average congressman does. A more believable result would be that there is no financial pay-off to co-sponsoring legislation; since the sponsor really gets major credit for a bill there is no apparent reason why campaign contributions would flow to the co-sponsors. But even this line of argument rings hollow. Members of Congress rarely co-sponsor a bill then fail to support passage later, assuming it comes to a floor vote (Bernhard and Sulkin 2011). For good reason - - it makes no sense for a politician to support legislation, actively through sponsorship or passively through co-sponsorship, that on balance places him at odds with his constituents and otherwise supportive interest groups. It simply must be assumed, as we do, that congressmen engage in behaviors that have positive returns, not negative returns. Where is the positive return to bill co-sponsorship?

Bill sponsorship and bill co-sponsorship

A politician benefits from co-sponsoring bills introduced by other politicians because co-sponsoring their bills helps facilitate passage of the bill(s) he sponsors (Wilson and Young 1997; Rocca and Gordon 2010). Because bill sponsorship demonstrably is linked with higher

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campaign contributions, from the sponsor's perspective co-sponsors must be regarded as a valuable input to his legislative production function. However, these valuable inputs presumably do not come free. This then begs the question what the sponsor of a bill offers potential co-sponsors in return for their support? What is the quid pro quo?

We hypothesize that bill co-sponsorship facilitates logrolling in a multi-lateral, inter-temporal bill production context. Fundamentally, bill co-sponsorship acts as a commitment mechanism that permits members of congress to engage in implicit contracting with one another. Because it is prohibitively costly for members of congress to write legally-enforceable explicit contracts with respect to their support for current or, especially, future legislation, formalized bill co-sponsorship helps mitigate time-incompatibility issues related to political bargains which are otherwise incentive compatible, by providing a written record of support for a bill. In private markets, the reputational capital of sellers acts as an implicit performance bond that reduces the likelihood that sellers will behave opportunistically by failing to deliver on their product quality promises, thereby facilitating transactions between buyers and sellers (Spence 1977; Klein, Crawford and Allen 1978; Klein and Leffler 1981; DeJong et al. 1985). More specifically in input markets, trade credit extended by input demanders bonds implicit agreements with input suppliers (Smith 1987; Lee and Stowe 1993; Long, Malitz and Ravid 1993; Laband and Maloney 1994). We suggest that, in political markets, bill co-sponsorship performs a similar performance assurance function - - bill co-sponsorship is the legislative analog to trade credit.

Legislative production requires the assistance of numerous colleagues (inputs). Consequently, bill sponsors devote considerable time and effort to soliciting the support of other Member Congressmen by building coalitions to promote their proposed legislation[4]. Assembling

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[4] In our discussion, we treat different co-sponsors as contributing equally to the legislative marginal product (bill passage). We have little doubt that in reality not all co-sponsors are created equal - - certain members of Congress

these coalitions involves making deals, compromising on key policy provisions, or trading support across bills - - a practice known as logrolling (Coleman 1966; Kau and Rubin 1979; Stratmann 1992). These deals, that span both time and political agenda, are potentially fragile because congressmen face a variety of competing electoral and policy goals.

Because it is prohibitively costly for congressmen to write explicit contracts guaranteeing their political support for other members' bills, the sponsor of a bill, intent on shepherding that bill through the legislative process, faces uncertainty regarding whether or not a fellow legislator will follow through on his commitment to support the bill. The transactions costs of legislative coalition-building can result in potentially suboptimal outcomes where desirable legislation does not get passed or even introduced. Legislators, therefore, must search for alternative mechanisms to make their legislative commitments credible.

How can co-sponsorship serve as a commitment device for ensuring bill fidelity? Consider the simplest case of two members of congress who wish to bargain: Congressman **A** needs support for his bill and Congressman **B** is willing to support Congressman **A**'s bill provided **A** reciprocally supports **B**'s bill. But reciprocity in a legislative context does not happen simultaneously, as bills are voted on serially, not contemporaneously. If **B**'s bill is up for a vote today, he needs **A**'s support now. However, **A** needs assurance from **B** that **B** will support **A**'s bill sometime in the future. Thus, **B** needs some way to credibly commit to support **A**'s bill through the legislative process. Hence, there is a time inconsistency component to the bargain. Co-sponsorship can bridge this gap by providing a written record of support for a bill in its infancy and give the primary sponsor a credible device to punish (perhaps, internally through the

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(MCs) are in positions that give them much greater control than other MCs over the fate of introduced bills. For example, Committee chairs can procedurally hobble a bill such that it never gets reported out of committee. We recognize the potential limitations of our analysis in this respect, but point out that this is a potentially fruitful line of additional empirical inquiry.

party) those who breach the agreement.[5]   Additionally, the expected cost of the commitment is low for **B** because the probability that **A**'s bill will be brought to a floor vote is low. However, the cost to **B**'s reputation should he pull his support for the bill if it reaches the floor could be considerable, as other house members would see that **B** breached the "contract."

As we move away from the most extreme time-inconsistent bargaining problem (i.e. a roll call vote vs. a fledgling bill), one can imagine that bill co-sponsorship facilitates the accumulation of reputational capital. Alternatively, it might be considered a form of loan - - a congressman extends valuable political capital to other House members in the current period, with the (presumably rational) expectation that this capital will be repaid at some point in the future. As congressman **A** sponsors more bills it becomes necessary to increase his (her) co-sponsorship activity to provide reciprocal support for other MCs that congressman **A** wants to co-sponsor (and ultimately vote in favor of) his legislation. Evidence in support of this proposition has been provided by Harward and Moffett (2010) who analyzed bill sponsorship and co-sponsorship in the U.S. Senate from 1975-2000. They report that Senators increase their level of bill co-sponsorship as the number of bills they sponsor increases.

Another important component to our analysis is the type of bill co-sponsorship we analyze. Not all bill co-sponsorship is created equal - - co-sponsors may be either original co-sponsors or secondary co-sponsors. The names of original co-sponsors appear on the bill when it is introduced to the house or senate floor; those co-sponsors who sign on ex-post do not appear to be *publicly* supporting the bill from its inception and thus we believe face a different set of

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[5] Our argument is highly consistent with the discussion contained in Bernhard and Sulkin (2011), who examine why a legislator would withdraw and/or renege on bill co-sponsorship pledges in the U.S. House. This behavior is described by them in the context of co-sponsorship as a commitment device supporting logrolling within the legislature.

costs and benefits with regards to the legislation. Here we are concerned only with original bill co-sponsorship and its hypothesized relationship with sponsorship and campaign contributions.

Our theoretical position that a given legislator uses bill co-sponsorship to build political capital that enhances his ability to subsequently sponsor his own bill(s) that are in turn supported by others is buttressed by the findings reported in Table 3. For the cohort of 52 freshmen members of the U.S. House of Representatives (111th Congress, which started in January 2007), we identified the number of calendar days it took each one to sponsor their first bill, the number of other House members that were original co-sponsors of that bill, and the number of other members' bills each one was an original co-sponsor on prior to sponsoring their first bill. We collected this data for Sessions 1 and 2 of the 111th Congress (2007-2008) and for Session 1 of the 112th Congress (2009). This permits us to compare bill sponsorship and co-sponsorship for the same individuals between their first and second years in the House (that is, they all started with zero political capital[6]), as well as between their first Session 1 and their second Session 1, on the chance that aspects of the legislative process differ from one Session to another.

Table 3 about here

We use our findings to answer two questions: (1) does bill co-sponsorship precede bill sponsorship, and (2) does this behavior change at all between year 1, when they have no political capital accumulation, and years 2 and 3, when they have accumulated bill co-sponsorship capital? The answer to question (1) is utterly unambiguous - - overwhelmingly, new House members exhibit a lot of original co-sponsorship (an average of 18 bills) BEFORE they sponsor

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[6] It should be obvious that members elected to the House and/or Senate come from far different backgrounds. Those that come from state legislatures or other politically connected positions (interest groups, children of former politicians) may indeed enter the house with ties to other members.

a single bill.[7] The answer to question (2) also is an emphatic 'yes.' From 2007 to 2008 85 percent of the freshmen reduced the number of bills they co-sponsored prior to introducing their first bill of the 2008 session (the mean # of original co-sponsorships prior to first sponsorship drops from 18 in year 1 to 4.6 in year 2). The average number of days before first sponsorship dropped from 82 in year 1 to 72 in year 2.

Because we have heard anecdotally that legislative activity is more concentrated in Session 1 than Session 2, which might help explain the observed changes just reported, we compared bill sponsorship and co-sponsorship of the freshmen in the 111th Congress, Session 1 (2007) against the bill sponsorship and co-sponsorship of the 45 remaining members of that freshman class who were in the 112th Congress, Session 1 (2009). In this 'cleaner' comparison, we observe that the average freshman House member still signed on as an original co-sponsor to 9.5 bills BEFORE sponsoring his/her first bill. Co-sponsorship of other House members' bills supports one's own bill sponsorship. However, the average number of bills co-sponsored prior to own bill sponsorship dropped by nearly 50 percent after a single 2-year Congressional cycle, which we take as evidence of political capital accumulation. As well, the average number days taken until first bill sponsorship dropped from 82 to 31, even as the average number of other House members signing on as co-sponsors to these first bills by the freshmen increased from 18 to 22 (a 20+ percentage increase).

The take-home message from this discussion is that bill co-sponsorship is not a final output that is valuable *per se* to voters and interest groups. Rather, bill co-sponsorship reduces transactions costs associated with multi-party, inter-temporal production in a legislative setting, in which the property rights (and therefore value, as translated into campaign contributions)

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[7] It is very clear from the data that the House leadership puts the loyalty of the new members to the test immediately by having them co-sponsor legislation introduced on the first day of a new Session.

accrue mainly to the principal sponsor of a bill. This hypothesized linkage between bill co-sponsorship, sponsorship, and campaign contributions suggests the OLS regression results reported in Table 1 are generated from an incorrectly specified econometric model.

Econometric Specification

Using the temporal ordering from the implicit contracting theory of bill co-sponsorship as a guide, we estimate a model where lagged values of co-sponsorship affect campaign contributions through current sponsorship activity. We present both theoretical and statistical evidence (in the results section) that lagged values of co-sponsorship meet the criteria for a valid instrumental variable. Equations (1) and (2) below characterize the two-stage least squares (2SLS) model we estimate.

$$\ln(Sponsor_{i,t}) = \delta Co - sponsor_{i,t-1} + X'_{i,t}\alpha + v_{i,t} \tag{1}$$

$$\ln(Campaign\ Contributions_{i,t}) = \beta Sponsor_{i,t} + X'_{i,t}\Gamma + u_{i,t} \tag{2}$$

$X'_{i,t}$ is a vector of candidate-specific characteristics for the i_{th} congressman in time t; $v_{i,t}$ and $u_{i,t}$ are idiosyncratic error terms; α, δ, Γ, β are parameters to be estimated; and *Sponsor, Co-sponsor,* and *Campaign Contributions* are defined in Table 1. Our identification strategy depends on the strength of a one-period lag of *Co-sponsor* as an instrument for *Sponsor*.[8]

The primary concern when evaluating 2SLS estimates resides with the exclusion restriction—i.e. the instrument is not correlated with unobservables in equation (2). The exclusion restriction implies that the instrument (*Co-sponsor_{t-1}*) affects the outcome variable in the structural equation only through the endogenous regressor (*Sponsor)* of interest. We rely on

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[8] Gerber (1998) uses a similar approach in which lagged values of campaign spending by incumbents and challengers create exogenous variation to identify the effect of current spending by candidates on election outcomes. Gerber argues that because senate races are time-staggered the same two candidates rarely meet in subsequent elections; hence, past values of campaign spending would not be correlated with unobserved characteristics of candidates that might affect election outcomes.

a well-documented set of control variables and theory to provide justification for excluding lagged values of *Co-sponsor* from equation (2).[9] The empirical evidence presented earlier in support of the hypothesized temporal ordering of bill sponsorship and co-sponsorship for the early stages of congressional careers should further mitigate concerns that our instrument does not satisfy the exclusion restriction.

First, holding constant the political ideology of the congressman, it is unlikely that potential campaign contributors condition their giving on past or current co-sponsorship behavior. Bill co-sponsorship is an input, not an output. Second, we believe (and the little empirical evidence that exists supports) that campaign contributors reward bill sponsorship, which implies that if co-sponsorship has an effect on campaign contributions it would occur through sponsorship. The sponsor of a bill is responsible for that legislation from its inception to its eventual passage or failure. The direct nature of this relationship implies the possibility of large costs for the sponsor irrespective of the bill's public reception. The fact that those costs exist also implies the existence of privately-capturable rents/benefits as well; otherwise why engage in the activity at all? A sponsor must be rewarded for marshaling support for the bill as this process takes time and involves the expenditure of political capital in order to gain supporters for the legislation. Political support comes in many different forms, one of which is co-sponsorship by other MCs. Co-sponsorship is a less costly means of position-taking than sponsorship so there must be some specific benefits conferred to sponsors that co-sponsors do not get (Campbell 1982; Schiller 1995; Platt 2008). Therefore if it is necessary to build coalitions for bill passage then the most obvious recipient for the rewards constituents use to get legislation

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[9] 2SLS estimates rely on the conditional independence assumption, which is commonly alluded to in the program evaluation literature, that the instrument is assumed exogenous once a proper set of covariates have been included (Angrist and Pischke 2009).

passed would be a bill's sponsor - - the congressman who has political property right to that legislation.

Control Variables

For the reasons enumerated in the preceding discussion, we expect there to be a positive relationship between the number of bills sponsored by a specific MC and the number of bills that individual co-sponsors, *ceteris paribus*. If a member intends to sponsor a larger number of bills, he or she must co-sponsor more bills to build the political capital needed to conduct the desired inter-temporal trades with his/her congressional colleagues. But the temporal context is important. A new MC who sponsors a large number of bills expecting support from the other members is likely to receive little support for his proposals. He will need to pledge support for the production demands of his colleagues and bond his pledge through formal co-sponsorship of their bills before they will reciprocate. Politicians must build legislative capital before they can spend it. Consequently, we model the number of bills sponsored in the current period as a function of the number of bills co-sponsored in the previous period. We specifically employ a single election cycle lag, since longer lags increase the likelihood that inter-temporal bargains will not be honored (e.g., one party dies, resigns due to scandal, gets beaten by a challenger, retires, etc).

There are well-established empirical bases for our expectations regarding the influence of the remaining explanatory variables in the first-stage model. For example, Campbell (1982) reported that more secure members in both the House and Senate co-sponsor fewer pieces of legislation than do less secure members. Based on our hypothesized linkage between bill co-sponsorship, bill sponsorship, and campaign contributions, we therefore expect to observe a

negative relationship between the percent of vote won by MCs and the number of bills they sponsor. We also include as an explanatory variable spending by the incumbent's principal opponent, which, in our view, reflects on the incumbent's electoral vulnerability. Increased spending by a challenger implies increased electoral vulnerability of the incumbent. One obvious way for a politically vulnerable incumbent to curry favor with prospective voters is to be a 'productive' representative; a publicly-observable indicator of this is the number of bills (s)he sponsors. We expect the number of bills sponsored to increase as spending by the incumbent's principal challenger in the most recent general election increases. Following both Krehbiel (1995) and Schiller (1995), we expect more senior MCs to sponsor more legislation than less senior MCs, *ceteris paribus*. The rationale is simple - - senior members have more clout in the congress than junior members and are therefore more capable of getting proposed legislation to a floor vote. Likewise, being a member of the majority party confers a greater ability to move legislation forward as compared to those MCs who are in the minority for a given congressional cycle (Cox and McCubbins 2004). Based on her analysis of bill sponsorship in the U.S. Senate, Schiller (1995) reports that committee chairs sponsor more legislation than MCs who are not committee chairs. Committee chairs in both the House of Representatives and Senate are in a position to influence legislative agenda and outcomes to a far greater extent than regular committee members; we therefore expect to observe committee chairs sponsoring more legislation than their colleagues. Holding seniority constant, we expect younger MCs to sponsor more legislation than older MCs, for the simple reason that they have a longer time horizon to amortize the political returns from doing so. Finally, it is well-known that legislative production generally is influenced by the ideology of legislators (Kau and Rubin 1982; Nelson 2002; Downs 1957; Dougan and Munger 1989; Kalt 1981; Peltzman 1984). Schiller (1995) reports specific

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evidence that liberal Senators sponsor more bills than conservative Senators. We control for this possibility by including each House member's rating score by Americans for Democratic Action (ADA), a commonly-used thermometer indicator of ideology. The ADA ratings reflect the percentage of time each MC votes consistently with the ADA on a series of bills that receive a floor vote each legislative session and thus is scaled from 0 (highly conservative) to 100 (highly liberal).

Turning to the second stage of our empirical model, we include well-known determinants of campaign contributions. Of critical importance is the impact of bill sponsorship. Based on the work of Rocca and Gordon (2010), who found that campaign contributions were positively correlated with sponsorship of gun control and labor legislation in the 103rd and 104th congresses, we expect to observe a more general positive relationship between campaign contributions and bill sponsorship. While conceding that bills vary in terms of their importance to voters and/or prospective contributors, we expect that, in general, as the number of bills sponsored by an MC rises so too will the campaign contributions received by that MC, and vice-versa.

We expect individual i's campaign contributions in the current election cycle to be influenced positively by the percent of the vote (s)he won in the previous general election (Jacobson, 1978; Grier and Munger, 1985; Dix and Santore, 2003; Rocca and Gordon, 2010).[10] However, controlling for percent of vote won in the most recent general election, we expect campaign contributions received by any specific MC to be related positively to the dollars spent by that MC's strongest challenger in the most recent election. Since the marginal product of campaign expenditures is higher for challengers than incumbents (Jacobson 1978; Kau and

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[10] This also allows us to avoid the simultaneity bias of observing contributions and the current vote share for congressmen.

Rubin 1982; Poole and Romer 1985), higher spending by challengers should induce MCs'

supporters to increase their financial contributions.

We expect the amount of campaign contributions received by an incumbent MC to

increase: (1) with legislative seniority, (2) for MCs who are committee chairs, and (3) for MCs in

the majority party, for straightforward supply-side reasons. MCs in the majority party, who have

considerable legislative seniority, and/or who chair congressional committees are differentially

able to influence the fate of introduced bills as compared to their MC colleagues who have less

seniority, who are in the minority party and/or who are not committee chairs, *ceteris paribus*.

Money flows to those who can get results (Pittman 1976; Mann and McCormick 1980;

Zardkoohi 1985; Rocca and Gordon 2010). We also expect the relationship between AGE and

campaign contributions to be positive, for two amortization-related reasons. First, other things

equal, older MCs have a shorter time horizon than younger MCs to make use of campaign

contributions (which can be converted to private use after leaving office). Second, older MCs

have less time to amortize political returns than younger MCs and political returns at least

partially substitute for financial returns. For either reason older MCs should demand more

money up-front for their political services than younger MCs.

Lastly, following Rocca and Gordon (2010), who found an inverse relationship between

campaign contributions and liberal political ideology, we expect the sign on ADA in the

contributions model to be negative.

Results

In Table 4 we present our two-stage least squares (2SLS) estimation results for

determinants of bill sponsorship and campaign contributions by members of the U.S. House of

Representatives for the four election cycles represented in the period 2000-2008. We report 2

models, one that excludes (model 1) and one that includes (model 2) several individual-specific control variables (age, seniority, committee chair, and majority party member). We do this to explore whether the coefficient estimates of the variables of interest reported in model 2 appear to reflect unobserved heterogeneity associated with these individual characteristics. However, the results of specific interest are robust to inclusion/exclusion of this set of control variables.

The stage 1 findings reveal a statistically compelling relationship between the number of bills a House member sponsors and the number of bills (s)he co-sponsored in the previous election cycle. The estimated coefficient on number of bills co-sponsored is positive (as expected) and statistically significant at the one-percent level. In conjunction with the F-statistic of 34.66 for the first-stage regression reported for Model 2, the statistically significant effect of *Cosponsor$_{t-1}$* on *Sponsor* indicates that the instrument is powerful.

In the context of our semi-log specification, we estimate that for every 10 additional bills a House member co-sponsored above the sample mean (111) in any given 2-year election cycle during this period, the number of bills (s)he sponsored during the subsequent 2-year period increased by 5 percent (one additional bill). This is evidence that supports our belief that a House member's bill sponsorship activity is, in part, dependent on his/her support for bills sponsored by other members within the chamber.

Most results in the first stage of the model are consistent with our expectations. House members who are in the majority party and/or who chair committees sponsor significantly more legislation than their colleagues who are in the minority and/or who are not committee chairs. We also observe that electoral vulnerability, as reflected by the percent of vote won by an incumbent in the most recent general election, affects his/her bill sponsorship behavior. Specifically, for every 10 percent of the vote won above the sample mean (69 percent), a House

member sponsors 6.4 percent fewer bills (17 instead of 18) in the subsequent two-year election cycle. However, our other measure of electoral vulnerability, spending by one's major challenger in the most recent general election, has no apparent impact on the number of bills sponsored by an incumbent House member. We fail to find evidence that the level of bill sponsorship activity is influenced significantly by an incumbent's seniority or ideology, proxied by ADA score. While the former is consistent with the findings of Schiller (1995), the latter is not. This may be an artifact of our analysis focusing on members of the House of Representatives whereas Schiller's analysis was confined to the U.S. Senate. Also, Schiller reports that this significant effect is so small that the influence appears to be negligible from an economic standpoint.

Turning our attention to the second stage results in Table 2, we are specifically interested in the estimated impact of bill sponsorship on campaign contributions. Our findings reveal that, once we condition campaign contributions on traditional determinants, bill sponsorship yields significant, positive, sizable returns in the form of campaign contributions. The standard errors are clustered at the individual level to allow for the possibility that observations of the same member of congress are not statistically independent. We estimate that a 10 percent increase in the number of bills sponsored above the sample mean (e.g., from 18 to 20) is associated with approximately a 34 percent ($391,000) increase in campaign contributions to a House member.[11] That is, campaign contributions appear to be highly elastic with respect to bill sponsorship. Since bill co-sponsorship is a vital component of subsequent bill sponsorship activity, there clearly is an eventual monetary payoff to bill co-sponsorship. While the sheer size of this payoff may seem large at first glance, we believe that the context is important. As indicated in Figure 1, there is a relatively tight distribution around the mean number of bills (12) sponsored by a given

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[11] We attempted a variety of alternative model specifications with different covariates and found our result of interest was robust in both sign and significance.

House member each 2-year cycle. Beyond what we assume is a relatively standard set of district-specific or state-specific resolutions, sponsorship of additional bills with real policy substance requires a lot of work and expenditure of significant political capital on the supply side and on the demand side surely has major economic implications for affected interest groups. Under the circumstances, the estimated returns to bill sponsorship seem neither unreasonable nor simply a reflection of an atypical group's behavior within Congress.

As expected, we observe that campaign contributions to an incumbent increase as his margin of victory in the previous general election increases. That is, donors donate more to strong winners than weak winners, *ceteris paribus*. However, donors also donate more to an incumbent facing a strong challenger, as indicated by the amount of money that challenger spent in his/her effort to unseat the incumbent. As expected, we observe a positive and significant estimated relationship between campaign contributions and MC age. Our finding of a statistically significant negative relationship between campaign contributions and ADA scores is consistent with the findings of Rocca and Gordon (2010). We fail to find a statistically significant impact of seniority on campaign contributions, a result that also is consistent with Rocca and Gordon (2010).

Somewhat surprisingly, we find statistically significant lower campaign contributions are linked to: (1) MC seniority, (2) majority party status, and (3) committee chairs. However, while these results may seem surprising at first glance, we believe they are both important and revealing. A critical aspect of seniority is the ability to obtain membership on influential committees (e.g. appropriations) that the most important introduced legislation gets assigned to for review and recommendation. Being in the majority party and, especially, being a committee chair, substantially enhances a legislator's ability to move proposed legislation through

committees to a floor vote. Consequently, it seems likely that our bill sponsorship variable captures a significant component of the (positive) returns to seniority, being a committee chair and being a member of the majority party. Moreover, this legislative productivity aspect has not been parsed out in any previous empirical analysis of aggregate campaign contributions that we are aware of. Among other things, we know from the first-stage estimation results that the latter two of these variables are strong predictors of bill sponsorship activity by House members. However, this would imply merely that the estimated impact of seniority, being a committee chair and/or majority party member would fall (and perhaps be statistically insignificant) in the presence of a control for bill sponsorship activity relative to a model without such a control variable. We do not have a ready explanation for the estimated negative and statistically significant effects.

Conclusions

As we noted at the beginning of this paper, bill co-sponsorship is a large-scale, widely engaged in practice in the U.S. House of Representatives. Yet we know relatively little about this important aspect of the legislative production process. We have documented, for the first time that we are aware of, returns to bill co-sponsorship in the form campaign contributions, as effected through the impact of bill co-sponsorship on bill sponsorship. In so doing, we have argued that bill co-sponsorship serves as a public-sector analog to private market mechanisms that facilitate exchange in the presence of unilateral or multilateral reneging risk. That is, bill co-sponsorship publicly bonds the intra-legislative performance of politicians by ensuring their fidelity with respect to political support for other politicians' bills. This permits politicians to execute inter-temporal trades of political support with each other at minimum risk of opportunistic behavior by the other parties. A clear implication of this theory is that the number

of bills introduced by a politician will be influenced significantly (positively) by the number of bills (s)he co-sponsors *ex ante*. We found strong and unambiguous empirical support for this proposition.

But a host of questions remain. For example, why did the House of Representatives adopt limited bill co-sponsorship in 1967, then move to unlimited bill co-sponsorship in 1980? This really is a multi-part question - - (1) why change the institutional structure of bill introduction at all, and (2) why did this institutional change occur *when* it occurred? Relatedly, can we explain why and when the various state legislatures adopted bill co-sponsorship? What effects, if any, have bill co-sponsorship had on legislative productivity and/or legislators? More generally, is there any evidence that this structural change in the legislative production process has had more encompassing consequences - - in terms, for example, of the size/scope of government and/or macroeconomic performance? What are the effects of bill co-sponsorship on legislative outcomes? Relatedly, are all bill co-sponsors created equal or is co-sponsorship by certain members of the legislature (e.g., members of especially influential committees and, especially, committee chairs) more important than others?

There is a gaping hole in the literature with respect to bill co-sponsorship; we invite other researchers to join us in trying to improve our understanding of the role of bill co-sponsorship in the legislative production process.

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Table 1: Variable Definitions, Means (st.dev), and OLS estimates

Variable	Definition	mean(st.dev.)	OLS
Campaign Contributions	Total PAC plus individual contributions received by each winning candidate during the 2001-2002 general election cycle for the U.S. House of Representatives, as reported by the Federal election commission	$1,150,938 (817572)	X
Sponsor	The number of bills sponsored by the congressman in a given election cycle.	17.84 (13.34)	0.006*** (0.001)
Cosponsor	The number of bills originally cosponsored by the congressman in a given election cycle.	111.65 (63.27)	-0.001*** (0.0002)
Challenger[1]	Amount of money spent by the winning congressman's principal opponent in a general election cycle	$386,595 (834567)	0.0001*** (0.00001)
MajorityParty	=1 if Congressman is in majority party	0.53 (0.50)	0.060* (0.034)
%PreviousVote	percentage of the vote congressman received in the previous election	68.56 (14.02)	-0.010*** (0.001)
Age	the congressman's age as of January 1, 2002	55.54 (9.57)	-0.012*** (0.002)
Seniority	number of years the congressman had served in the House of Representatives up to the 2002 general election	11.17 (7.95)	0.006 (0.002)
Committee Chair	=1 if Congressman chaired a committee	0.04 (0.20)	0.226 (0.078)
ADA Score	= the average Americans for Democratic Action[12] (ADA) score of each member congressman in year t,	49.21 (40.73)	0.0004 (0.0004)
Congressional Time Dummies			X
Observations[1]		1629	1468
R-square			0.307

Notes: There are only 1468 observations for *Challenger* because of missing values.[1] Standard errors are clustered at the individual level.

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[12] The mission statement of Americans for Democratic Action states that: "Americans for Democratic Action has and will continue to be a forthright liberal voice of this nation. We work to advocate progressive stances on civil rights and liberties, social and economic justice, sensible foreign policy, and sustainable environmental policy."
(Taken from: http://www.adaction.org/pages/about.php, accessed March 18, 2010). ADA develops an annual rating of U.S. Congressmen and Senators, based on the percentage of time each politician votes consistently with the ADA position on a wide-ranging set of bills. Because the substance of these bills reflects a wide range of policy issues (spending, military, environmental, social, economic), the ADA ratings provide a barometer of party-based differences across the policy spectrum.

Table 2: Sponsorship and Co-Sponsorship Activity by Seniority in Congress (2000 – 2008)

	1st Term	2nd Term	3rd Term	4th Term
Sponsor	12.40	15.95	16.52	17.38
	(9.093)	(10.73)	(9.633)	(11.62)
(Original)	81.58	107.2	111.4	110.3
Co-sponsor	(47.27)	(53.17)	(54.35)	(55.17)
(Unoriginal)	200.9	194.8	201.4	192.8
Co-sponsor	(108.7)	(90.07)	(95.35)	(96.35)
Observations	218	183	181	180

Notes: Means(stddev) computed for members of congress in their first, second, third and fourth terms.

Table 3: Bill (co)sponsorship by House freshmen – 110th Congress (2007-2008-2009)

	1st Session 2007	2nd Session 2008	1st Session 2009
Year			
Day sponsored first bill	82.17	72.23	31.22
# bills co-sponsored by date of first bill sponsorship	18.02	4.6	9.49
# co-sponsors on first bill sponsored	18.02	19.23	22.22
Observations	52	52	45

Notes: Compiled by authors.

Table 4: 2SLS Estimation Results

Variable	Model 1		Model 2	
	1st Stage	2nd Stage	1st Stage	2nd Stage
ln(*Sponsor*)		4.241***		3.453***
		(0.221)		(0.278)
Cosponsor$_{t-1}$	0.00400***		0.00511***	
	(0.000361)		(0.000399)	
Seniority			0.000712	-0.0285
			(0.00324)	(0.0173)
Age			-0.00176	0.0494***
			(0.00251)	(0.0140)
Committee Chair			0.479***	-0.1468**
			(0.109)	(0.0560)
Majority Party			0.354***	-0.0727***
			(0.0459)	(0.5948)
ADA Score			-0.000567	-0.0102***
			(0.000638)	(0.00284)
%PreviousVote	-0.00355**	0.0323***	-0.00596***	0.0419***
	(0.00180)	(0.0106)	(0.00175)	(0.00736)
Challenger	2.82e-08	0.000000389**	2.78e-08	0.000000373**
	(2.79e-08)	(0.000000191)	(2.66e-08)	(0.000000175)
109th Congress	0.111**	-0.128	0.123**	-0.131
	(0.0518)	(0.186)	(0.0492)	(0.152)
110th Congress	0.203***	-0.411	0.234***	-0.337
	(0.0543)	(0.258)	(0.0518)	(0.205)
Constant	2.425***		2.380***	
	(0.134)		(0.173)	
Observations	953	953	953	953
F statistic	27.81	191.0	26.67	93.99
R-square	0.128		0.221	

Notes: First Stage Dependent Variable: ln(Sponsor). Second Stage and Robustness Dependent Variable: ln(Contributions). Standard errors (in parentheses) are clustered at the individual level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Fig. 1: Kernel Density Estimates of Legislative Activity

kernel = epanechnikov, bandwidth = 2.1280