Politician's Ideology and Campaign Contributions from Interest Groups[*]

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Abstract

This paper studies the effect of a politician's ideological strength on campaign contributions that the politician receives from interest groups. If interest groups care mainly about current policy outcomes, they will make campaign contributions to ideologically neutral politicians who are often pivotal voters in the legislature. However, if interest groups care more about future policy outcomes, they have an incentive to help ideologically strong politicians who share similar policy preferences to win the election. I first develop a model incorporating these two opposing effects. Then I show empirical evidence that ideologically neutral politicians receive more campaign contributions from interest groups.

1 Introduction[1]

Now it is well known from political economy literature that politicians' behavior is not always consistent with the predictions of the models based on a benevolent social planner. This is because the interest of politicians does not perfectly coincide with the interest of the electorate that they serve. Instead of working for the interest of the electorate, politicians may spend more time and effort to increase the probability of winning the next election, or to have the policy that benefits themselves, not the people they serve, implemented. Thus, understanding politicians' behavior requires more than simply studying the characteristics or preferences of the electorate that they serve. It requires us to study political and economic incentives that politicians may have. One of the most important incentives that politicians have is campaign contributions that they receive from interest groups. The money will help politicians win the next election.

There is a growing volume of literature that studies the interaction between politicians and interest groups. Interest groups make campaign contributions to politicians for, at least, two reasons that are not mutually exclusive. First, interest groups want to influence the policy outcomes that politicians choose. Second, interest groups want to help their favorite politicians win the election and continue to serve in the legislature. Given the amount of campaign contributions and various policy issues over which they lobby, the influence of interest groups on politicians' decisions is an important issue in politics and economics. According to the Center for Responsive Politics[2], the total monetary contributions from interest groups in various sectors exceed \$1 billion during the 112th Congress (2011-12). Thus, we should not neglect the influence of interest groups when we study policy decisions of politicians.

If their monetary contributions are effective in influencing the policy outcomes, interest groups then have to decide "which politicians" to give money. This is especially true if interest groups have a limited amount of resources that they can spend on lobbying. While there

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[1]Some of the material in this section, especially, the related literature on interest groups, is also used in Choi (2013).

[2]See http://www.opensecrets.org

are numerous papers that study the impact of interest groups on various policy outcomes, it is less so for the study of which politicians receive more monetary contributions from interest groups. One obvious hypothesis is that influential politicians will receive more contributions from interest groups. Another important characteristic of a politician is the politician's ideological preferences. If politicians with certain ideological preferences are systematically more responsive to monetary contributions from interest groups, i.e. more likely to reward contributions with favorable policy outcomes, interest groups have incentives to focus their lobbying efforts on those politicians. Or interest groups may make monetary contributions to politicians with similar policy preferences to help them win the election. This is the focus of this paper. To the best of my knowledge, this is the first paper that studies the effect of a politician's ideological preference on the interest groups' lobbying efforts on the politician.

Theoretically, two opposite possibilities arise. First, if interest groups' main concern is current, or short-run, policy outcomes, they may make monetary contributions to ideologically neutral politicians, who are often pivotal voters in the legislature, to influence their policy decisions. It may be difficult to influence the decisions of ideologically strong politicians. In contrast, ideologically neutral politicians may be very responsive to monetary contributions from interest groups. In this case, interest groups will focus on their lobbying efforts on these ideologically neutral politicians. However, interest groups have a different incentive in the long run. If they also care about future, or long-run, policy outcomes, they have an incentive to keep their favorite politicians in the legislature. So they will help those politicians win the election by making campaign contributions. In this case, liberal interest groups will give money to liberal politicians and conservative interest groups will give money to conservative politicians. Thus, there is a clear contrast between short-run and long-run incentives. The direction of the net effect depends on which of the two opposing effects is larger.

In the empirical parts of this paper, I estimate the effect of the ideological strength of a politician on the amount of monetary contributions that the politician receives from interest groups. For this analysis, I use two main sources of data. For a measure of ideological preferences, I use the DW-NOMINATE score (Poole and Rosenthal 1985, 1997, 2007), which is

a commonly used proxy for the ideological preferences of politicians in political science and political economy literature. For monetary contributions given by interest groups to politicians, the Center for Responsive Politics provides data on the amount of contributions that a politician receives from various sectors. I focus on the members of the House of Representatives in the 111th Congress (2009-10). My baseline empirical findings show that ideologically neutral politicians receive more contributions from interest groups than ideologically strong politicians. According to the theoretical model, this suggests that interest groups care more about current policy outcomes so that they give more to the pivotal, or median, voters in the legislature to influence their decisions.

The baseline results may suffer from endogeneity problems, especially, reverse causality. Since the measure of politicians' ideology is based on the past roll-call voting records and politicians are likely to vote for the policy that their donors like, the contributions from interest groups will affect the politicians' estimated ideology scores. To correct for this endogeneity bias, I estimate the effect using instrumental-variable (IV) estimation. I use a measure of a politician's childhood political environments as an instrument for her current ideological preferences. The results of the IV estimation strongly reinforce those of the baseline OLS estimation: ideologically neutral politicians receive more money from interest groups.

The results may give a compromise to the long-standing debate on politician voting behavior. Some researchers argue that politicians respond to constituent and interest group pressure.[3] Others argue that politicians primarily vote according to their ideological preferences.[4] The theoretical model and empirical results of this paper suggest that we need to understand behavior of ideologically strong and neutral politicians separately. Ideologically strong politicians simply vote according to their ideological preferences. It is hard to change their voting decisions. Knowing that, interest groups do not lobby them heavily. In contrast, ideologically neutral politicians respond to political and economic incentives. They reward monetary contributions from interest groups with favorable policy outcomes. Thus, they

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[3]See, for example, Stigler (1971), Kalt and Zupan (1984), and Peltzman (1985).
[4]See, for example, Kau and Rubin (1979, 1993), Bernstein (1989), Poole and Rosenthal (1996), and Lee, Moretti, and Butler (2004)

receive more money from interest groups. If we analyze these politicians together in one frame, we may have difficulties in finding a universal pattern of voting behavior. This may be one reason for the long-standing debate on politician voting behavior.

This paper contributes to two strands of literature: median-voter model and lobbying by interest groups. Proposed by Hotelling (1929) in a spatial model and applied by Black (1948) to voting in committees and by Downs (1957) to electoral competition, the median-voter model has been a workhorse in many of the political-economic applications.[5] In a public finance model, Romer (1975), Roberts (1977), and Meltzer and Richard (1981) show that the size of taxation and government spending reflects the preferences of the median voter and is larger with more income inequality measured by the position of median income relative to mean income. With more unequal income distribution, the median voter becomes poorer relative to the mean income and the politicians will please the median voter by offering a higher level of redistribution. This model has met with mixed empirical results in a national or cross-country.[6] However, in a national or cross-country setting, the assumptions for the existence of a median-voter equilibrium are likely to be violated. So some researchers study small-scale local issues where the assumptions of a single-dimensional policy space and the single-peaked preferences of the voters are more likely to hold. But they still find mixed results.[7] Due to these mixed results, we cannot conclude that the median-voter model has universal applicability. The empirical success of the model depends on the settings and issues of a specific study.

Until recently, research on interest groups and lobbying had been predominantly theoretical.[8] However, there is a growing volumn of empirical research on this issue. In international trade literature, studies generally find that politically organized sectors receive more import protection from the government.[9] Researchers also find that interest groups have an influ-

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[5] For a survey, see Persson and Tabellini (2000)

[6] See, for example, Husted and Kenny (1997), Gouveia and Masia (1998), Milanovic (2000), Borge and Rattso (2004), and Kenworthy and Pontusson (2005).

[7] See, for example, Coate, Conlin, and Moro (2008), Brunner and Ross (2010), and Corcoran and Evans (2010).

[8] For a survey, see Grossman and Helpman (2001)

[9] See, for example, Goldberg and Maggi (1999), Gawande and Bandyopadhyay (2000), Gawande, Krishna, and Robbins (2006), Ludema, Mayda, and Mishra (2010), Facchini, Mayda, and Mishra (2011).

ence on other policy issues.[10] There are also some papers that study the effect of lobbying activities by financial or mortgage industries during the recent financial crisis.[11] These studies clearly show that lobbying by interest groups has an influence on policy outcomes. The allocation of monetary contributions by interest groups among different politicians, however, remains an open question and this is the subject of this paper. Specifically, this paper studies whether interest groups give more money to ideologically neutral or strong politicians.

The rest of the paper is organized as follows. Section 2 presents the model. Section 3 describes the data. Section 4 presents the empirical results. Finally, Section 5 concludes.

2 The Model

A. One-Period Model

I assume that there are three politicians - L, M, and R. The index of their ideological preferences is denoted by a_i (for $i = L, M, R$) with $a_L < a_M = 0 < a_R$. This index measures the ideological position of a politician and can be thought of as a liberal to conservative, or left to right, scale. Thus, L (for Left) is a liberal politician, R (for Right) is a conservative politician, and M (for Middle or Median) is in between. They vote in Congress and a bill or a policy platform that the majority of them prefers will be implemented. Specifically, there are two alternative policy platforms - g_L and g_R. Thus, the policy platform favored by at least two politicians will be implemented. We can think of one of the platforms as a status-quo and the other as a new policy proposal.

I also assume that there are two interest groups - L-group and R-group[12]. L-group's preferred policy is g_L and R-group's preferred policy is g_R. Interest groups may make monetary contributions to the politicians to affect their voting decisions in the legislature..

The voting behaviors of the politicians depend on three factors - 1) their ideological pref-

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[10]See, for example, de Figueiredo and Silverman (2006) for universities' earmarked grants, Richter, Samphantharak, and Timmons (2009) for a corporate tax rate, Gawande, Maloney, and Montes-Rojas (2009) for tourism, and Chen, Parsley, and Yang (2012) for corporations' financial outcomes.

[11]See, for example, Mian, Sufi, and Trebbi (2010a,b), Igan, Mishra, and Tressel (2011), and Choi (2013).

[12]This assumption reflects the reality that agents with strong ideological preferences form an interest group. In other words, interest groups are usually either very conservative or very liberal.

erence, 2) contributions from interest groups, and 3) a random component. With everything else equal, L-politician is more likely vote for g_L, R-politician is more likely vote for g_R and M-politician is indifferent. Contributions from L-group increase the probability to vote for g_L and contributions from R-group increase the probability to vote for g_R. The mean of the random component is zero. The voting behaviors of the politicians can be summarized by the following: Politician i^{13} (where $i = L, M, R$) will

vote for g_L if $a_i - h(m_L - m_R) + \delta_i < 0$

vote for g_R if $a_i - h(m_L - m_R) + \delta_i > 0$

vote for g_L or g_R with probability $\frac{1}{2}$ each if $a_i - h(m_L - m_R) + \delta_i = 0$

where m_L and m_R are contributions from L-group and R-group, respectively, and $h(\cdot)$ is an increasing function that captures the effect of the contributions from the interest groups on the politicians' voting behavior, i.e. the pressure from the interest groups. If a politician receives the same amount from the two groups, the effect is neutral, i.e. $h(0) = 0$. Assume, for simplicity, that $h(\cdot)$ is linear so that $h'(\cdot) = k > 0$ where k is a constant and that $h(m) = -h(-m)$ for any $m \geq 0$. And δ_i is the realization of the random variable for politician i. Thus, L-politician (R-politician) has a higher probability to vote for g_L (g_R, respectively) and monetary contributions from L-group (R-group) increase the probability to vote for g_L (g_R, respectively). Assume that δ_i is has a uniform distribution with mean 0 and density ψ, i.e. $\delta_i \sim U[-\frac{1}{2\psi}, \frac{1}{2\psi}]$ and the realization of this variable is not observable to the interest groups.[14]

As mentioned above, interest groups have policy preferences. They may make monetary contributions to politicians to increase the probability that their favorite policy gets implemented. Since I assume that the two interest groups are perfectly symmetric, I normalize their policy preferences such that $W_L(g_L) = W_R(g_R) = Q$ and $W_L(g_R) = W_R(g_L) = 0$ where W_j is the policy preference of group j (for $j = L, R$). In other words, they get Q from their favorite policy and 0 from the other. They also have increasing marginal disutility from

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[13] I use the terms "i-politician" and "politician i" (for $i = L, M, R$) interchangeably. I also use the terms "j-group" and "group j" (for $j = L, R$) interchangeably.

[14] In reality, δ may reflect the preference of the electorate that the politician serves, the influence of her party leaders, and so on. Although these factors are not random, the result of the model will hold if they are not perfectly observable to the interest groups.

monetary losses. Thus, the expected utility of group j can be written as

$$EU_j = p_L W_j(g_L) + p_R W_j(g_R) - \tfrac{1}{2}m_j^2$$

where p_L (p_R) is the probability that g_L (g_R, respectively) gets implemented. By the normalization of the policy preferences, their expected utility can be simplified to $EU_L = p_L Q - \tfrac{1}{2}m_L^2$ and $EU_R = p_R Q - \tfrac{1}{2}m_R^2$. I assume that each interest group can make contributions to only one politician and there is a limit on the amount of the contributions, i.e., $m_i < \overline{m}$. We can think of $\overline{m}$ as the resource constraint of the interest groups or the maximum level allowed by law.

To make the politicians distinct from one another, assume that their ideological indexes are far apart from one another. In other words, politician L is very liberal and politician R is very conservative. Thus, I make the following assumption.

Assumption 1. (i) $a_L < -h(\overline{m}) - \frac{1}{2\psi}$ and (ii) $a_R > h(\overline{m}) + \frac{1}{2\psi}$

By the voting conditions mentioned above, L-politician will vote for g_L if $a_L - h(m_L - m_R) + \delta_L < 0$. Under Assumption 1, this term is negative even when he receives the maximum amount of contributions from R-group and no contributions from L-group and the realization of δ_L is the right extreme ($\frac{1}{2\psi}$). So L-politician always votes for g_L regardless of the contributions received from any interest groups and the realization of δ_L. Similarly, R-politician always votes for g_R.[15] Thus, the outcome of the voting process is determined by the decision of M-politician. Knowing that, interest groups will focus on their lobbying efforts only on M-politician. L-politician and R-politician do not change their decisions by the contributions from interest groups, but the decision of M-politician, who is the pivotal voter in the legislature, is affected by the contributions. Thus, I have the following proposition.

Proposition 1. L-group and R-group contribute $m_L = m_R = \psi k Q$ to M-politician. They do not contribute at all to either L-politician or R-politician. The outcome of the voting process is determined by the realization of δ_M: if $\delta_M < 0$, g_L is implemented and if $\delta_M > 0$, g_R is implemented.

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[15]By making this assumption, it seems too obvious that interest groups will only lobby the median politician. However, as I will show in the next subsection, if there are two periods, interest groups have an incentive to make monetary contributions to one of the extreme politicians even if the money cannot changer their voting behavior.

Proof of Proposition 1. Since L-politician always votes for g_L and R-politician always votes for g_R, M-politician is the pivotal voter and the interest groups will not make any contributions to L-politician and R-politician. M-politician will vote for g_L if $a_m - h(m_L - m_R) + \delta_M < 0$. Since $a_M = 0$, she will vote for g_L if $\delta_M < h(m_L - m_R)$. Since δ_M has a uniform distribution $U[-\frac{1}{2\psi}, \frac{1}{2\psi}]$, the probability that she votes for g_L is $\frac{1}{2} + \psi h(m_L - m_R)$. So the probability that g_L gets implemented is $p_L = \frac{1}{2} + \psi h(m_L - m_R)$. By the preferences of the interest groups, $EU_L = p_L Q - \frac{1}{2}m_L^2 = \{\frac{1}{2} + \psi h(m_L - m_R)\}Q - \frac{1}{2}m_L^2$ and $EU_R = p_R Q - \frac{1}{2}m_R^2 = (1-p_L)Q - \frac{1}{2}m_R^2 = \{-\frac{1}{2} - \psi h(m_L - m_R)\}Q - \frac{1}{2}m_R^2$. The first order condition for each group's maximization problem yields that $m_L = m_R = \psi k Q$. So both groups give the same amount $\psi k Q$ to M-politician. Since $m_L = m_R$ in equilibrium and $h(0) = 0$, the voting condition for M-politician states that she will vote for g_L if $\delta_M < 0$ and vote for g_R if $\delta_M > 0$. □

Thus, the interest groups want to influence the policy outcome by making monetary contributions to M-politician, who is the pivotal voter in the legislature and whose decision can be influenced by the contributions from the interest groups. The amount of the contributions $(\psi k Q)$ depends on three factors. First, if the stake (Q) is high, they contribute more. Second, if the politician's decision is very responsive to monetary contributions that she receives (high k), they contribute more. And, finally, if the random component is very narrowly distributed (ψ is high) so that it is less important in the politician's decision relative to their contributions, they contribute more.

In this model, L-politician and R-politician do not receive any contributions because their decisions are not affected by the contributions. But if the interest groups care also about future policy outcomes, they have an incentive to make monetary contributions to one of the extreme politicians, not to affect their voting decision, but to affect their reelection probability. This is the focus of the next subsection.

B. Two-Period Model with an Election

Now I assume that there are two periods. An election is held at the end of the first period and those who win the election serve in the legislature in the second period. Contributions

from the interest groups not only affect the politicians' voting decisions, but also affect their reelection probability. Thus, the interest groups have two incentives when they make contributions to the politicians: (i) to induce the politicians to vote in their favor and (ii) to help their favorite politician win the election so that she can also serve in the next period. To focus on "to which politician" to contribute rather than "how much" to contribute, I assume that each interest group makes a fixed amount of contributions, i.e. $m_L = m_R = \widehat{m}$ to one of the three politicians. So the last term in the interest groups' utility function $(-\frac{1}{2}m_j^2)$ can be dropped without affecting the results. The interest groups decide which politician to give money at the beginning of the first period. They do not make any monetary contributions in the second period.

As in the previous subsection, there are three politicians - L, M, and R. Their ideological indexes are same as above and I still assume that L-politician and R-politician have very extreme ideological preferences, i.e. Assumption 1 still holds. If a politician wins the election, she continues to serve in the next period. If she loses, she is replaced by a new politician. The new politician has an ideological index a_N, which is distributed symmetrically around zero. Thus, $E(a_N) = 0$. Without any contributions from the interest groups, the reelection probability of an incumbent is p_I. The contributions from the interest groups increase the reelection probability. Specifically, I assume that when a politician receives campaign contributions $\widehat{m}$, the reelection probability increases by θ, i.e. from p_I to $p_I + \theta$.

The voting conditions of the politicians are same as in the previous subsection for each period. The interest groups, however, take into account the expected utility of the second period. So the expected utility function of group j (for $j = L, R$) can be written as

$$EU_j = p_L^1 W_j(g_L) + p_R^1 W_j(g_R) + \beta(p_L^2 W_j(g_L) + p_R^2 W_j(g_R))$$

where p_k^t (for $k = L, R$ and $t = 1, 2$) is the probability that g_k is implemented in period t and β is the time discount rate. By the normalization of their policy preferences as in the previous subsection, $EU_L = p_L^1 Q + \beta p_L^2 Q$ and $EU_R = p_R^1 Q + \beta p_R^2 Q$.

If the interest groups value the current period highly enough relative to the future period, they will give money to M-politician exactly by the same reasons that we discussed in the previous subsection: L-politician and R-politician do not change their voting decisions, but

the decision of M-politician, who is the pivotal voter in the legislature, is influenced by the contributions from the interest groups. However, they may have different incentives if they value the future period highly enough. Knowing that their contributions increase the politician's reelection probability, L-group may make monetary contributions to L-politician to keep him in the next period's legislature. L-politician will always vote for g_L, which is the L-group's favorite policy. By the same reason, R-group may make monetary contributions to R-politician. So the question of "to which politician" to contribute depends on the interest groups' valuation of the future period relative to the current period, i.e. the size of β. Thus, I have the following proposition.

Proposition 2. Let $\overline{\beta} \equiv \frac{4\psi\widehat{h}}{\theta}$ where $\widehat{h} \equiv h(\widehat{m})$. (i) If $\beta < \overline{\beta}$, both L-group and R-group make monetary contributions to M-politician in the unique Nash equilibrium. (ii) If $\beta > \overline{\beta}$, L-group makes monetary contributions to L-politician and R-group makes monetary contributions to R-politician in the unique Nash equilibrium.

   Proof of Proposition 2. See the Appendix.

Thus, if the interest groups value the current period highly enough relative to the future period, they give money to ideologically neutral politicians. If they value the future highly enough, they give money to ideologically strong politicians whose policy preference coincides with them. Notice that the threshold level $\overline{\beta}$ depends on three factors - $\psi, \widehat{h}$, and θ. If the random variable δ is narrowly distributed, i.e. ψ is high, or if $\widehat{h}$ is high, then the contributions are very effective to influence the voting decision of M-politician. So it is more likely that the interest groups give money to M-politician. As mentioned above, θ is the increase in the reelection probability of a politician when she receives contributions from the interest groups. If this term is high, the contributions are very effective to help the favorite politician win the election. So it is more likely that the interest groups give money to ideologically strong politicians whose policy preference coincides with them. Note that when p_I is 1 and, thus, θ is 0, incumbents are always reelected and the interest groups will always give money to M-politician. This is because their contributions do not affect the results of the election, so they just want to influence the decision of M-politician in the current period.

   Thus, there are two opposing forces. In the short run, interest groups have incentives

to affect the decisions of ideologically neutral politicians. In the long run, however, they also have incentives to help their favorite politicians, i.e. ideologically strong politicians whose policy preferences coincide with theirs, to win the election. Relative magnitude of the two effects determines whether it is ideologically neutral politicians or ideologically strong politicians that receive more monetary contributions from interest groups. So this is an empirical question. The next two sections describe the data and the empirical results.

3   Data and Summary Statistics

A. Data[16]

My analysis of lobbying activities of interest groups utilizes two main data sets: campaign contribution data and politician ideology data. I obtain campaign contribution data from the Center for Representative Politics (CRP), a nonpartisan, independent, and nonprofit research group, which collects data on campaign finances directly from Federal Election Commission's reports as well as other information such as outside spending, federal lobbying, revolving-door, federal earmarks, and the personal finances of politicians. Specifically, it provides the list of firms and organizations that contribute to the members of the Congress and how much each of them contributes to each politician. It also provides aggregated industry-level data and further aggregates them into 13 different sectors and provides the sector-level data.[17] For my analysis, I use the sum of the contributions from the 13 different sectors because it is the measure of the total contributions from various interest groups. And I focus on the data for the contributions that the members of the House of Representatives received during the 111th Congress (2009-10).[18]

For data on politician ideology, I use the DW-NOMINATE scores constructed by Carroll, Lewis, Lo, McCarty, Poole, and Rosenthal (updated in 2011).[19] The procedure is based

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[16]Some of the material in this subsection is also used in Choi (2013).

[17]These sectors are agribusiness, communications/electronics, construction, defense, energy/natural resources, finance/insurance/real estate, health, lawyers/lobbyists, transportation, misc. business, labor, ideological/single-issue, and others combined.

[18]The 111th Congress was the most recently completed Congressional term when I was writing this manuscript.

[19]The data are available at http://voteview.com/dwnominate.asp

on the original research by Poole and Rosenthal (1985, 1997, 2007) and it attempts to estimate the underlying ideology of a politician based on the politician's past roll-call voting records. The first dimension of the DW-NOMINATE scores can be interpreted as a liberal to conservative, or left to right, scale, increasing in conservatism. So a large positive score implies that the politician is very conservative and a large negative score implies that the politician is very liberal.

I also include other characteristics of politicians in my analysis. These include seniority (the number of terms served so far including the current term), leadership political action committee (PAC)[20], race, sex, leadership positions, and committee assignments. To take into account that politicians who are having a competitive election usually receive more campaign contributions, I also include the percentage gap between the incumbent and his or her rival in the 2010 election as a measure of electoral competitiveness.[21] Information on these variables are easily obtainable from various sources, for example, the politician's official website.

Finally, for IV estimation, I use an estimate of the ideological strength in an area where the politician grew up. This is a measure of the effect of the politician's childhood exposure to political environments that surrounded him on his current ideological preference. I construct this variable from the data on past presidential elections. Specifically, this is the difference in the popular vote shares between the state (where the politician grew up) and the nation of the presidential candidate from the party that the politician currently belongs. I focus on the first presidential election taken place after the politician had turned 18.[22] For example, Nancy Pelosi (Democrat, California District 8), the House Speaker of the 111th Congress, was born in 1940. She grew up in Maryland and turned 18 in 1958. In the 1960 presidential election, the presidential candidate from the Democratic Party was John F. Kennedy. He received 49.72% of the popular votes nationally and 53.61% in Maryland. So the measure

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[20] A politician can set up a leadership PAC to make independent expenditures. For example, it can fund travel, administrative expenses, and other non-campaign expenses. It can also make donations to other politicians. Thus, politicians often use the fund to gain influence among the colleagues. I include monetary contributions received by leadership PACs as well as those received by campaign committees in this analysis.

[21] The 2010 House of Representatives election was held on November 2, 2010.

[22] In most states, the minimum voting age is 18. And in many states, 17-year-old people can vote in primary elections if they will be 18 on or before the day of the general election.

of the strength of the liberalism that surrounded Nancy Pelosi when she was young is 3.89 (=53.61-49.72).

Among the representatives who served in the 111th Congress, I only include those who had completed the term from the beginning to the end. For example, I exclude from my sample Kirsten Gillibrand (Democrat, New York District 20) who resigned from her House seat and Scott Murphy who succeeded her.[23] I also exclude from my sample five representatives who ran for governor, twenty representatives who retired, and ten representatives who ran for Senate with the end of the 111th Congress because those representatives received a substantially different amounts of contributions from interest groups.[24] I also exclude one representative who changed his party affiliation during the 111th Congress. So my sample includes 384 members of the House of Representatives in the 111th Congress.

B. Summary Statistics

Table 1 presents summary statistics. The variables are split into three panels: ideology, other characteristics, and monetary contributions from interest groups.

Table 2 presents the top recipients and the top contributors. Panel A lists the top 5 recipients. Most of them held a leadership position.[25] Panel B lists the top 5 committees whose members received the largest amount of the contributions on average. And Panel C lists the top 5 sectors that contributed the most to the representatives.

4   Empirical Results

A. Graphical Evidence

Figure 1 depicts the scatterplot for total contributions and DW-NOMINATE scores of the politicians in my sample with two separate linear fitted lines, one for each party. Points on

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[23] Eleven representatives did not complete the term. Four accepted another position, two ran for governor, two ran for Senate, two resigned due to sexual misconduct, and one died.

[24] Of the seven representatives with the lowest contributions, five ran for governor with the end of the 111th Congress. The mean for them is $41,158 while the mean in my sample is $1,332,445. The mean for retiring representatives is $354,213 and the mean for the representatives who were running for Senate is $4,135,253.

[25] Eric Cantor was the Minority Whip, John Boehner was the Minority Leader, Steny Hoyer was the Majority Learder, and James Clyburn was the Majority Whip.

the left half of the figure are observations for Democrats and points on the right half are for Republicans. As we move toward the center on the ideological score, either from the left or from the right, the total contribution gets larger on average. Thus, we observe that ideologically neutral politicians receive more contributions from interest groups.

B. Benchmark OLS Results

For regression analyses, I need to convert the measure of ideology to the measure of the ideological strength or extremity, i.e. the measure that does not depend on whether it is far left or far right. An obvious measure can be the absolute value of the DW-NOMINATE score. Since a large positive (negative) score implies strong conservatism (liberalism, respectively) and the mean of the DW-NOMINATE score is very close to zero, the absolute value of the DW-NOMINATE score measures the ideological strength. Similarly, I can use the deviations from the median value (-0.198) of the DW-NOMINATE scores. This may better capture the idea of the median voter theorem. However, there is a problem with these two measures. As shown in Table 2, the absolute values of the DW-NOMINATE scores are substantially higher for Republicans than for Democrats. So using one of the two measures may yield a biased estimate if the party membership (i.e. whether a Democrat or a Republican) has an effect on monetary contributions that may not be perfectly controlled by including a party indicator variable in the regressions. An alternative measure may be a deviation from the party mean, i.e. the difference between the absolute value of the DW-NOMINATE score and that of the party mean. For example, since the mean of the DW-NOMINATE score for Democrats is -0.368, a Democrat with the DW-NOMINATE score of -0.5 has a strength score of 0.132 while a Democrat with the DW-NOMINATE score of -0.2 has a strength score of -0.168. By construction, this measure is scaled such that the mean is zero for each party. So I use this variable for the ideological strength of the politicians in the following regressions.[26]

Table 3 presents the results of the OLS estimation. The dependent variable is the log of the total contributions. In column (1), I include the ideological strength and other politician characteristics as well as leadership positions[27] as independent variables. In column (2), I also

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[26] All of the results in this paper are unchanged if I use any one of the other two measures.

[27] Congress leadership positions are Speaker, Majority/Minority Leaders, Majority/Minority Whips, Cau-

include committee fixed effects to take into account that the members of some committees may receive more or less than the members of other committees.[28][29] In column (3), I also include the state fixed effects.[30] In all of the specifications, I find a significantly negative effect of the ideological strength on the amount of monetary contributions that politicians receive from interest groups. Democrats receive more than Republicans[31] and non-whites receive less. Politicians who have a leadership PAC receive more and the same is true for those who were having a close election. Congress and committee leaders receive more while the effect is much larger for Congress leaders. The standard deviation of DW-NOMINATE score for each party is about 0.15. So the shift of the DW-NOMINATE score by one standard deviation toward the center increases the total contributions by about 18% $(= 0.15 \times 1.20)$.

C. Different Effects for Different Parties?

The magnitude of the effect of the ideological strength on the amount of monetary contributions that politicians receive from interest groups may differ for different parties. As we can see in Figure 1, while Republicans receive less contributions on average, the fitted line seems less steep for Republicans. There are two ways to take into account this differential effect: to allow for a different slope by including an interaction term or to run two separate regressions, one for each party. Table 4 reports these results. In column (1), I include an interaction term of the ideological strength and the membership of the Republican Party. The coefficient on the ideological strength is still negative and significant, but the coefficient on the interaction term is positive and significant. Thus, although the effect is still negative and significant for Democrats, it is less so for Republicans. I restrict the sample to Democrats in column (2) and to Republicans in column (3). Consistent with the result in column (1), we can see in

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cus Chair, Conference Chair, Policy Chairs, and Steering Chair. Committee leaderships positions are Chair and Ranking Member of each committee.

[28]Their are 19 House committees that I include in this analysis. Those are Agriculture, Appropriations, Armed Services, Budget, Education and Labor, Energy and Commerce, Financial Services, Foreign Affairs, Homeland Security, House Administration, Intelligence, Judiciary, Natural Resources, Oversight and Government Reform, Rules, Science and Technology, Small Business, Transportation and Infrastructure, Veterans' Affairs, and Ways and Means. I exclude joint committees.

[29]A politician can be assgined into multiple committees.

[30]I include an indicator variable for each state that has at least three representatives.

[31]One possible reason can be that the Democrats hold the majority in both the Senate and the House in the 111th Congress. And the president was a Democrat (Barack Obama) except for the first two weeks of the 111th Congress.

column (2) that the ideological strength has a negative and significant effect on the amount of monetary contributions for Democrats. Although the magnitude of the effect is smaller in column (3) for Republicans, it is still negative and significant. Thus, the effect of the ideological strength on the total contributions that politicians receive from interest groups is negative for both Democrats and Republicans and the effect is larger for Democrats.

D. IV Results

Although I include a number of control variables in my baseline regressions, I am concerned that the estimates might be biased by some endogeneity problems. Specifically, the estimates might be affected by reverse causality. My estimates above suggest that interest groups give more to ideologically neutral politicians. However, the causality might run the other way. There may be a third, omitted, factor that affects the amount of the contributions. And a politician who receives a lot of contributions from a conservative interest group (because of the third, omitted, factor), for example, may be forced to vote for conservative policy outcomes. Since the DW-NOMINATE score is estimated based on past roll-call voting records, this politician will have a strong conservative ideology score. Thus, it is the contributions from the interest group that make the politician's estimated ideology strong, not the reverse. On the other hand, it is also plausible that the politicians that receive a lot of contributions from both conservative and liberal interest groups are forced to please both interest groups or, at least, not to disappoint any one of the groups. So those politicians may vote once for a conservative policy outcome and once for a liberal policy outcome, giving him ideologically neutral voting records. In other words, monetary contributions from interest groups make the politician's estimated ideology neutral. So I address this reverse causality and other endogeneity problems by using instrumental variable estimation.

The instrument for the ideological strength is a measure of the ideological strength of the political environments that surrounded the politician when she was young. As explained in Section 3, I construct this variable from the presidential elections data. Specifically, it is the percentage gap between the state (where the politician grew up) and the national popular votes of the presidential candidate of the party that the politician currently belongs. I focus on the first presidential election after the politician turned 18.

The surrounding political environments during childhood may have a life-long effect on the political ideology of a politician. For example, Maxine Waters (Democrat, California District 35) was born in August, 1938 in Missouri and grew up there. In the 1956 presidential election, the Democratic candidate Adlai Stevenson gained 41.97% of the national popular votes. However, he gained 50.11% of the popular votes in Missouri (Missouri was one of the seven states that he won). This suggests that Missouri had very liberal political environments during that time. The measure of the ideological (liberal in this case) strength of the childhood environments for Maxine Waters is, thus, 8.14 (=50.11-41.97). And this may partly explain her strong liberal ideological score (her DW-NOMINATE score is -0.655 where the mean for Democrats is -0.368 with the standard deviation of 0.161 and the mean for California Democrats is -0.465 with the standard deviation of 0.144). The correlation between the ideological strength and the instrument for all the politicians in my sample is 0.19.

One possible critique could be that the instrument simply reflects the state-party effects. For example, if California has been liberal throughout most of the years and most of the Democratic politicians in Californian were born and raised in California (so the size of the instrument is large for those politicians) and if politicians in California receive more contributions than politicians in other states for reasons not related to their ideology or any other control variables included in the regression, then the exogeneity assumption for the instrument might be violated. So I include state fixed effects or state-party fixed effects in my regression. In addition to the overall correlation between the ideological strength and the instrument, the two variables are positively correlated even among the politicians of the same party and same state. For example, the correlation between the ideological strength and the instrument for California Democrats is 0.13. Similarly, the correlation between the two variables for Texas Republicans is 0.09. These are not negligible compared to the overall correlation of 0.19.

Table 5 presents the results of the IV estimation. In column (1), I include committee fixed effects. In columns (2), I add state fixed effects.[32] And in column (3), instead of state fixed

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[32] As in the OLS regressions, I include an indicator variable for each state that has at least three representatives.

effects, I include state-party fixed effects, i.e. one dummy variable for California Democrats and another for California Republicans.[33] In all of the specifications, the coefficient on the ideological strength is negative and significant at least at the 10% significance level. And compared to the OLS results in Table 3, the magnitude of the effect is much larger in IV estimation. The shift of the DW-NOMINATE score by one standard deviation for each party toward the center increases the total contributions by about 48% (= 0.15 × 3.20). This suggests the possibility for the second scenario of the reverse causality discussed above – a politician who receives a lot of contributions from both conservative and liberal interest groups is induced to please both conservative and liberal interest groups, making his estimated ideology neutral. So the size of the effect (in absolute values) is larger after I correct for this endogeneity bias.

5   Conclusions

This paper studies the effect of the ideological strength of a politician on monetary contributions that the politician receives from interest groups. I develop a theoretical model to show that the effect depends on the preferences of interest groups. Interest groups will give more money to ideologically neutral politicians if they are primarily motivated by current, or short-run, policy outcomes. In contrast, interest groups will give more money to ideologically strong politicians if they care more about future policy outcomes. To the best of my knowledge, this is the first study that demonstrates these effects and tests empirically. Using the data on the ideological scores of the members of the House of the Representatives in the 111th Congress (2009-10) and monetary contributions that they receive from interest groups, I find evidence that ideological neutral politicians receive more monetary contributions from interest groups. So the centripetal forces dominate the centrifugal forces and this can be an application of the median voter theorem.

The main independent variable used in this study is the DW-NOMINATE score, a measure of ideological positions based on the past voting records. While suitable for studying the

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[33]I include an indicator variable for each state-party pair that has at least three representatives.

relationship between the total contribution from interest groups and the ideological strength, it cannot be used to study the effect of a voting record for a specific bill on monetary contributions that politicians receive from the interest groups that may benefit or lose from the bill. Thus, it may be an interesting extension of research on such interaction between politicians and interest groups. Choi (2013) attempts a first estimate of such effect. He finds evidence that voting in favor of the financial firms during the recent financial crisis has increased the amount of monetary contributions that the members of U.S. House of Representatives receive from the interest groups in the financial sector after the passage of the bill. Alternatively, as many have done so far, one can also study the reverse causality: how the contributions from interest groups affect politicians' policy decisions. Given the influence of interest groups on various policy outcomes and the substantial amount of contributions given by interest groups to politicians, this is an important area of research and the volume of research will continue to grow.

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Appendix: Proof of Proposition 2

Note that L-group will never make any contributions to R-politician. R-politician always votes for g_R regardless of the contributions from the interest groups. So L-group has no benefit from helping her staying in the legislature. Similarly, R-group will never make any contributions to L-politician.

I analyze the strategies of L-group given the strategy of R-group. The strategies of R-group are perfectly symmetric.

First, suppose that R-group contributes $\widehat{m}$ to R-politician.

If L-group contributes $\widehat{m}$ to L-politician, the probability that g_L is implemented in the current period, i.e. the probability that M-politician votes for g_L is $\frac{1}{2}$. L-politician and R-politician will win the election with the same probability $(p_I + \theta)$ while M-politician will win the election with probability p_I. If any of these politicians lose the election, she will be replaced by a new politician with ideology index a_N which is distributed symmetrically around zero. Because of the symmetry in this case, the ex-ante probability that g_L is implemented in the next period is also $\frac{1}{2}$. Thus, the expected utility of L-group when it makes monetary contributions to L-politician is $EU_{LL} = \frac{1}{2}Q + \frac{1}{2}\beta Q$.

If L-group contributes $\widehat{m}$ to M-politician, the probability that g_L is implemented in the current period, i.e. the probability that M-politician votes for g_L is $\frac{1}{2} + \psi\widehat{h}$. M-politician and R-politician will win the election with probability $p_I + \theta$ while L-politician will win the election with probability p_I. If M-politician loses, she is replace by another politician whose expected ideology index is same as M-politician's index, i.e. $E(a_N) = a_M = 0$. So, in expectation, it does not change the outcome of the second period whether M-politician wins or loses the election. With probability $p_I(p_I + \theta)$, both L-politician and R-politician win the election and, in this case, the probability that g_L is implemented in the second period is $\frac{1}{2}$. With probability $p_I(1 - p_I - \theta)$, L-politician wins the election and R-politician loses the election and, in this case, the probability that g_L is implemented in the second period is $\frac{3}{4}$. With probability $(1 - p_I)(p_I + \theta)$, L-politician loses the election and R-politician wins the election and, in this case, the probability that g_L is implemented in the second period is $\frac{1}{4}$. With probability $(1 - p_I)(1 - p_I - \theta)$, both L-politician and R-politician lose the election and, in

this case, the probability that g_L is implemented in the second period is $\frac{1}{2}$. So the probability that g_L is implemented in the second period when L-group makes monetary contributions to M-politician while R-group makes monetary contributions to R-politician is $\frac{1}{2} - \frac{1}{4}\theta$ and the expected utility of L-group in that case is $EU_{LM} = (\frac{1}{2} + \psi\widehat{h})Q + \beta(\frac{1}{2} - \frac{1}{4}\theta)Q$. Notice that $EU_{LM} > EU_{LL}$ if and only if $\beta < \overline{\beta} \equiv \frac{4\psi\widehat{h}}{\theta}$. Thus, when R-group makes contributions to R-politician R, L-group will make contributions to M-politician if $\beta < \overline{\beta}$ and it will make contributions to L-politician if $\beta > \overline{\beta}$.

Now suppose that R-group contributes $\widehat{m}$ to M-politician.

Similar calculation as above will show that L-group will make monetary contributions to M-politician if $\beta < \overline{\beta}$ and it will make monetary contributions to L-politician if $\beta > \overline{\beta}$.

So it can be summarized that regardless of the strategy of R-group, if $\beta < \overline{\beta}$, it is a strictly dominating strategy for L-group to make contributions to M-politician and if $\beta > \overline{\beta}$, it is a strictly dominating strategy for L-group to make contributions to L-politician.

Since both interest groups are perfectly symmetric, it can be easily shown that regardless of the strategy of L-group, if $\beta < \overline{\beta}$, it is a strictly dominating strategy for R-group to make contributions to M-politician and if $\beta > \overline{\beta}$, it is a strictly dominating strategy for R-group to make contributions to R-politician.

Thus, if $\beta < \overline{\beta}$, it is the unique Nash equilibrium that both groups make monetary contributions to M-politician and if $\beta > \overline{\beta}$, it is the unique Nash equilibrium that L-group makes monetary contributions to L-politician and R-group makes monetary contributions to R-politician. $\square$

Figure 1. DW-NOMINATE Scores and Contributions from Interest Groups
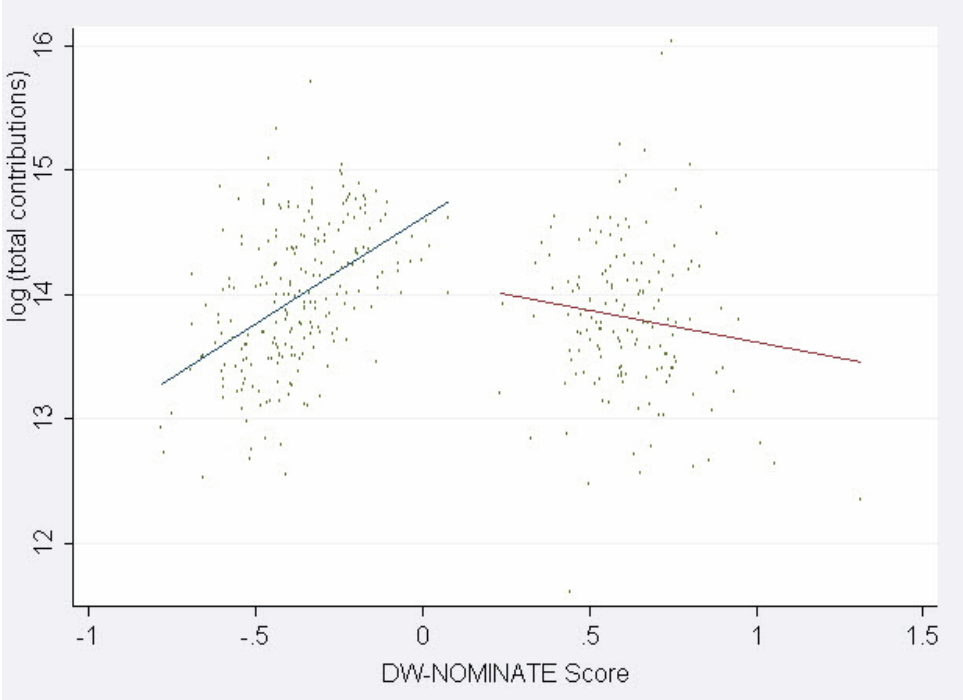
Note: The maximum DW-NOMINATE score for Democrats is 0.082 and the minimum DW-NOMINATE score for Republicans is 0.233. So all of the observations on the (roughly) left half of the figure are for Democrats and all of the observations on the (roughly) right half are for Republicans. I include two linear fitted lines, one for each party.

Table 1. Summary Statistics

	N	Mean	SD	Min	Max
Panel A: Ideology					
Overall	384	0.032	0.512	-0.778	1.315
Democrat	229	-0.368	0.161	-0.778	0.082
Republican	155	0.623	0.156	0.233	1.315
Panel B: Politician Characteristics					
Seniority	384	6.06	4.60	1	28
Dummy=1 if Democrat	384	0.60	0.49	0	1
Dummy=1 if Non-White	384	0.17	0.38	0	1
Dummy=1 if Female	384	0.18	0.38	0	1
Dummy=1 if have a leadership PAC	384	0.68	0.48	0	1
Dummy=1 if Congress leader	384	0.03	0.17	0	1
Dummy=1 if committee leader	384	0.10	0.30	0	1
Vote margin (in percentage)	384	31.71	22.70	0.2	100
childhood political environment	384	0.49	7.18	-29.43	40.58
Panel C: Contributions from IG					
Overall	384	1,332,445	946,516	110,959	9,148,572
Democrat	229	1,396,776	828,041	277,470	6,673,815
Republican	155	1,237,402	1,094,408	110,959	9,148,572
Non-White	66	933,370	641,584	277,470	4,529,415
Female	68	1,268,890	759,258	277,470	3,824,881
Having a leadership PAC	257	1,440,645	1,036,722	232,116	9,148,572
Congress leader	12	3,852,250	2,759,684	1,023,723	9,148,572
Committee leader	39	1,481,850	781,580	307,916	4,015,605
If vote margin ≤ 5%	33	1,936,081	485,290	911,810	2,761,747

Table 2. Top Recipients and Top Contributors

	Mean or Total Amount	SD
Panel A: Top 5 Politicians		
Eric Cantor (R, Virginia District 7)	9,148,572	0
John Boehner (R, Ohio District 8)	8,325,571	0
Steny Hoyer (D, Maryland District 5)	6,673,815	0
James Clyburn (D, South Carolina District 6)	4,529,415	0
David Camp (R, Michigan District 4)	4,015,605	0
Panel B: Top 5 Committees (Mean)		
Ways and Means	1,977,725	1,515,955
Financial Services	1,448,579	842,115
Veteran's Affairs	1,445,126	691,115
Energy and Commerce	1,371,611	605,065
Budget	1,360,329	759,608
Panel C: Top 5 Sectors (Total)		
Finance, Insurance & Real Estate	92,193,987	0
Health	57,236,757	0
Lawyers & Lobbyists	51,658,909	0
Misc Business	51,223,232	0
Labor	47,595,860	0

Table 3. OLS estimation

Dependent variable →	Log of the total contributions		
	[1]	[2]	[3]
Ideological strength	-1.162***	-1.204***	-1.256***
	[0.177]	[0.190]	[0.209]
Democrat	0.248***	0.242***	0.201***
	[0.065]	[0.061]	[0.065]
Non-White	-0.264***	-0.281***	-0.262***
	[0.067]	[0.068]	[0.073]
Female	0.029	0.043	0.074
	[0.062]	[0.063]	[0.068]
Seniority	-0.014**	-0.021***	-0.022***
	[0.007]	[0.007]	[0.008]
Vote margin (in %)	-0.005***	-0.005***	-0.006***
	[0.002]	[0.001]	[0.001]
Having Leadership PAC	0.330***	0.313***	0.326***
	[0.051]	[0.049]	[0.053]
Congress leader	1.080***	0.877***	0.887***
	[0.232]	[0.232]	[0.271]
Committee leader	0.330***	0.336***	0.329***
	[0.095]	[0.092]	[0.100]
committee fixed effects	No	Yes	Yes
state fixed effects	No	No	Yes
F-test (p-value) on			
committee dummies		0.0000	0.0000
state dummies			0.0840
Observations	384	384	384
R-squared	0.40	0.51	0.55

Note: (i) Standard errors are robust to heteroskedasticity and denoted in parentheses.
(ii) ***, **, and * represent statistical significance at 1, 5, and 10 percent, respectively.

Table 4. OLS estimation with heterogenous party effects

Dependent variable →	Log of the total contributions		
	Overall	Democrats only	Republicans only
	[1]	[2]	[3]
Ideological strength	-1.680***	-1.535***	-0.825**
	[0.233]	[0.273]	[0.343]
(Ideological strength) × (Republican)	0.968**		
	[0.399]		
Democrat	0.242***		
	[0.061]		
Non-White	-0.252***	-0.271***	-0.152
	[0.067]	[0.077]	[0.187]
Female	0.064	0.052	0.232*
	[0.062]	[0.075]	[0.118]
Seniority	-0.018**	-0.004	-0.027
	[0.007]	[0.010]	[0.009]
Vote margin (in %)	-0.005***	-0.005***	-0.003
	[0.001]	[0.002]	[0.002]
Having Leadership PAC	0.308***	0.226***	0.484***
	[0.049]	[0.060]	[0.093]
Congress leader	0.877***	0.788***	1.055**
	[0.218]	[0.188]	[0.492]
Committee leader	0.347***	0.208	0.391***
	[0.089]	[0.146]	[0.098]
committee fixed effects	Yes	Yes	Yes
state fixed effects	No	No	No
Observations	384	229	155
R-squared	0.52	0.54	0.61

Note: (i) Standard errors are robust to heteroskedasticity and denoted in parentheses.
(ii) ***, **, and * represent statistical significance at 1, 5, and 10 percent, respectively.

Table 5. IV estimation

Dependent variable →	Log of the total contributions		
	[1]	[2]	[3]
Ideological strength	-3.205**	-4.064**	-3.200*
	[1.326]	[1.647]	[1.643]
Democrat	0.297***	0.263***	0.264
	[0.075]	[0.081]	[0.165]
Non-White	-0.242***	-0.237	-0.106
	[0.081]	[0.086]	[0.104]
Female	0.130	0.150*	0.148*
	[0.090]	[0.089]	[0.084]
Seniority	-0.010	-0.010	-0.015
	[0.011]	[0.012]	[0.009]
Vote margin (in %)	-0.001	0.001	-0.003
	[0.003]	[0.004]	[0.003]
Having Leadership PAC	0.371***	0.407***	0.375***
	[0.068]	[0.078]	[0.067]
Congress leader	0.915***	0.957***	1.030***
	[0.254]	[0.302]	[0.236]
Committee leader	0.317***	0.261**	0.300***
	[0.108]	[0.117]	[0.098]
committee fixed effects	Yes	Yes	Yes
state fixed effects	No	Yes	No
state-party fixed effects	No	No	Yes
F-test (p-value) on			
committee dummies	0.0000	0.0000	0.0000
state dummies		0.6958	
state-party dummies			0.0013
First-stage F-statistic	9.45	7.17	5.90
Observations	384	384	384
R-squared	0.34	0.26	0.46

Note: (i) Standard errors are robust to heteroskedasticity and denoted in parentheses.
(ii) ***, **, and * represent statistical significance at 1, 5, and 10 percent, respectively.