# Lobbying and Legislative Representation*

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**Abstract**

A common concern is that lobbying by interest groups distorts democratic representation by shifting legislators away from their constituents' preferences. For lobbying to harm legislative responsiveness, the preferences of interest groups must diverge from those of the constituents of the legislators they lobby. We analyze the ideological alignment between interest groups, members of Congress, and their constituents across four policy areas: the environment, healthcare, immigration, and trade. Using issue-specific measures of district opinion and campaign contributions as a proxy for lobbying contacts, we find that legislators representing more conservative districts are more likely to be lobbied by conservative groups, suggesting that lobbying often reinforces, rather than distorts, representational alignment. We then estimate a structural model of roll-call voting that incorporates lobbying. The estimated effects are modest but show that lobbying nudges legislators to vote more consistently with district opinion. Lobbying does not systematically distort legislative responsiveness.

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# 1 INTRODUCTION

Does lobbying harm democracy? An overwhelming majority of Americans believe it does. The prevailing concern is that lobbying causes legislators to prioritize the interests of organized groups over those of their constituents. Narratives about politicians being "captured" by special interests are pervasive in media reporting and in advocacy campaigns for political reform. In a 2023 poll, 73% of respondents said that lobbyists and special interest groups exert "too much influence" over members of Congress, while 70% said constituents have too little influence over their representatives (Pew, 2023). Whether lobbying ultimately harms legislative responsiveness, however, depends on the extent to which the preferences of interest groups align or conflict with those of the voters represented by the targeted legislators. This article empirically evaluates whether lobbying systematically distorts the connection between district preferences and legislative behavior.

Despite widespread public skepticism, theories of lobbying reach mixed conclusions about its effect on legislative responsiveness. *Quid pro quo* theories, in which interest groups provide contributions or resources in exchange for favorable policy, imply that lobbying directly distorts policy away from voter preferences (Snyder, 1991; Grossman and Helpman, 1994). In contrast, informational theories propose that lobbyists influence legislators through expertise and persuasion, with ambiguous consequences for responsiveness (Hansen, 1991; Austen-Smith, 1993; Lohmann, 1995). By shaping legislators' beliefs, lobbying may push them away from their constituents' positions, but additional information may also improve policy quality. Finally, subsidy theories emphasize that legislators are resource-constrained, and argue that interest groups assist allied lawmakers by supplying specialized resources and support (Hall and Deardorff, 2006). Under this view, lobbying may even enhance responsiveness if the resources provided help legislators implement policies preferred by their constituents.

A necessary condition for lobbying to reduce legislative responsiveness is that legislators are lobbied by interest groups whose policy preferences diverge from those of their constituents. Even if lobbying influences legislators to vote in line with interest group preferences, it would only diminish responsiveness if those preferences conflict with constituent views. Examining whether interest group preferences align with those of voters also helps distinguish between theories of lobbying (Schnakenberg and Turner, 2024). Under *quid pro quo* models, interest groups have little incentive to lobby legislators who already share their priorities; those legislators would vote in line with the interest group in the absence of lobbying. In contrast, informational theories predict that groups target persuadable legislators—those who are somewhat supportive or mildly opposed—because credible information can move these legislators closer to the group's position (Wright, 1996). A more recent strand of

informational theory suggests that interest groups may also lobby ideological allies, who can act as intermediaries by transmitting information to other members of the legislature (Schnakenberg, 2017; Awad, 2020). Finally, subsidy theories propose that interest groups concentrate their efforts on legislators who are already aligned with their preferences, providing them with resources that help advance shared policy goals (Hall and Deardorff, 2006; Ellis and Groll, 2020).

Despite making different predictions about whom interest groups lobby, most theories of lobbying are silent on where legislators' alignment with interest group preferences originates. A vast literature on legislative accountability and responsiveness, however, identifies constituents as a primary driver of legislators' behavior. Understanding the relationship between elected officials and their constituents has long been central to scholarship on representative democracy (Miller and Stokes, 1963; Achen, 1977; Bartels, 1991), and extensive research finds a strong correlation between roll-call voting and district public opinion (e.g., Clinton (2006); Butler and Nickerson (2011)). Consequently, misalignment between the preferences of lobbying interest groups and those of constituents is problematic not only because it creates a channel through which lobbying can move legislators away from their constituents' positions, but also because it suggests *quid pro quo* influence.

This paper examines how the ideology of interest groups relates to the legislators they target and to the preferences of those legislators' constituents across four salient policy areas: the environment, healthcare, immigration, and trade. These are issues which are both heavily lobbied and relevant enough to public opinion to feature in large scale surveys. To capture constituency preferences on each issue, we scale responses from hundreds of thousands of survey respondents and apply multilevel regression with poststratification to account for demographic and geographic nonrepresentativeness (Tausanovitch and Warshaw, 2013). We measure the ideology of both interest groups and legislators by combining interest group public positions on congressional bills with legislators' roll-call voting behavior, following Crosson, Furnas and Lorenz (2020). The resulting measures of legislative and constituent ideology are highly correlated—even within the same legislator across different issues—indicating that the measures capture variation distinct from general left–right orientation. Because the Lobbying Disclosure Act does not require interest groups to report which legislators they lobby, we infer lobbying contacts by linking the individual lobbyists hired by each group on specific issues to the legislators those lobbyists support through campaign contributions. This approach builds on evidence that contributions facilitate access to policymakers (Bertrand, Bombardini and Trebbi, 2014; Kalla and Broockman, 2016; Kim et al., 2025).

Our main results concern the relationship between the ideological preferences of a legislator's constituents and the ideology of the interest groups that lobby that legislator on a given

issue. In our most restrictive specification, a one standard deviation shift to the right in voters' preferences on an issue corresponds, on average, to the legislator being lobbied by interest groups that are about 0.1 standard deviations more conservative on the legislator ideology distribution. This association holds in two-way fixed effects specifications that exploit within-legislator and district-issue variation in district preferences over time. We also find similar results instrumenting district ideology with changes in the demographic mix of constituents. The pattern—where more conservative districts are lobbied by more conservative interest groups—is inconsistent with *quid pro quo* theories of lobbying, which predict the opposite. That legislators are targeted by interest groups aligned with their constituents suggests that, if anything, lobbying may push legislators closer to their constituents' preferences rather than away from them.

In the second part of the paper, we directly study whether lobbying strengthens or weakens the relationship between legislators and constituents. We develop a simple model of legislative voting in which a legislator's decision on a bill is shaped by both their spatial preferences and lobbying by groups supporting or opposing the bill. This model yields a linear expression for the probability of a legislator voting for a bill (Heckman and Snyder, 1997), which we estimate using an interactive fixed effects model (Bai, 2009). Estimating this model provides a measure of how lobbying affects roll-call voting, controlling for legislators' latent ideology, as well as a counterfactual measure of ideology in the absence of lobbying. Our estimates indicate that lobbying does influence legislative voting, though the effects are small. Comparing regressions of legislator ideology, estimated with and without lobbying, on constituent preferences indicates that lobbying does not weaken—and in fact modestly reinforces—the alignment between legislative behavior and district opinion.

Legislative responsiveness to district preferences in roll-call voting represents only one dimension of democratic representation. Lobbying may also alter representation through other channels. For example, lobbying may help determine which issues legislators choose to emphasize or devote resources to, thereby shaping the legislative agenda without necessarily altering the direction of individual legislators' policy positions. We analyze how lobbying relates to legislators' issue-specific effectiveness and issue prioritization. There is a robust positive correlation between issue-specific lobbying and legislative effectiveness. However, greater lobbying on a given issue is associated with reduced effectiveness on other issues, though this result is sensitive to model specification. We also find no evidence that lobbying shifts legislators away from issues that their constituents prioritize. Overall, these findings suggest lobbying may affect which legislators are effective in formulating policy, but does not distort the dyadic connection between constituent preferences and legislative behavior.

Our paper makes three contributions. First, we provide an updated empirical assessment

of the normative implications of lobbying for legislative representation. Hall and Deardorff (2006) conceptualized lobbying as a legislative subsidy that can enhance representation, drawing on a long-standing but largely impressionistic literature suggesting that lobbyists tend to target allies (Bauer, Pool and Dexter, 1964). We offer a systematic reassessment of this claim, validating its core insight and presenting evidence consistent with theories of lobbying that view it as less harmful to democracy. Using new data and methods, we also examine how lobbying might distort legislative representation and challenge the oversimplified notion that lobbying primarily involves interest groups capturing legislators and pulling them away from their constituents.

Second, we advance the literature on lobbying strategy by demonstrating that constituency preferences are a central input into interest groups' targeting decisions. Our findings indicate that interest groups generally lobby legislators whose constituents hold preferences aligned with the group's position on specific issues. This suggests that lobbying operates not behind the backs of voters but often in concert with public opinion. This insight has important implications for how we understand both the deployment and effectiveness of lobbying: interest groups may be less willing or able to lobby when they cannot identify legislators whose constituencies are aligned with their preferences, while constituents who share preferences with well-resourced groups may benefit from enhanced representation through legislative subsidies.

Third, we advance the study of political representation by conceptualizing lobbying as an input into the representational process and by offering a tractable framework for analyzing this relationship. We develop and estimate a model that links lobbying activity to legislative voting behavior while explicitly accounting for legislators' underlying preferences and constituency opinions. This framework enables us to evaluate how factors shaping legislative behavior—including lobbying—affect the degree to which legislators reflect their constituents' views. In doing so, we provide both empirical evidence and a methodological template for future research on how external pressures interact with legislator preferences to influence legislative responsiveness.

## 2 INTEREST GROUPS, LEGISLATORS, AND VOTERS

Interest groups are often referred to as "special interests" because they are assumed to focus on a narrow set of issues, and the term carries the implicit assumption that their priorities may not align with the preferences of the broader public. Media coverage frequently reinforces this narrative, highlighting instances where "special interests" are seen as distorting policy away from voter preferences and the public good. For example, in its special report

titled *Corruption Consultants*, the Center for American Progress argues that conservative special interests and corporations "skew political and economic power toward corporations or billionaires and away from everyday Americans," particularly at the state level (Wall, Root and Schwartz, 2019). In a recent report advancing a new global standard designed to curb undue influence and promote equitable stakeholder participation in policymaking, the OECD cautions that "public policies that are misinformed and responsive solely to the interests of particular groups may ultimately fail to serve the broader public good" (OECD, 2025).

There is a long-standing literature emphasizing the power of special interests to bias public policy in their favor. The theory of regulatory capture, originating with Stigler (1971), argues that regulation is not primarily driven by the public interest but is instead captured by the very industries it is meant to oversee. Regulation is used by well-organized interest groups to secure economic advantages, often at the expense of the general public (Carpenter and Moss, 2013). Grossman and Helpman (1994) provide a tractable analytical framework for analyzing the influence of special interests, particularly in the context of trade policy. Their central insight is that trade protection is "sold" by politicians in exchange for campaign contributions from interest groups—explaining why inefficient protectionist policies persist. A core assumption in this tradition of *quid pro quo* or exchange theories of interest group influence is that the preferences of interest groups and politicians' constituents are misaligned, so that political activity by interest groups tends to move policy away from what the public prefers.

But does this core assumption hold? Little existing research directly investigates this divergence. Two important studies answer related, but distinct questions. First, Gilens and Page (2014) use survey data to identify the policy preferences of average citizens (at the median income level), affluent citizens (90th income percentile), and powerful interest groups. Their goal is to assess whose preferences influence US policymaking. They find a negative correlation between the preferences of average citizens and those of business interest groups, and shows that economic elites and business interest groups exert substantial influence over policy outcomes. In contrast, average citizens have little to no independent influence once elite and organized group preferences are accounted for. To measure interest group preferences, Gilens and Page (2014) use stated positions from a list of "powerful" groups on various issues: 28 business interests (e.g. the Chamber of Commerce), 11 mass-based groups (e.g. the National Rifle Association), and 3 others not classified as either (e.g. universities). While these organizations are nationally influential, the list is narrow, especially given that more than 10,000 groups register to lobby at the federal level each year. Moreover, their analysis is conducted at an aggregate level—assessing whether the policy preferences of different groups are associated with policy change across issues—rather than at the level of

individual legislators. As a result, it does not address whether interactions with interest groups systematically distort legislative behavior away from the preferences of average citizens.

Second, Giger and Klüver (2016) use policy referendum data from Switzerland to measure citizen preferences and examine how interactions with interest groups affect the relationship between constituency preferences and legislators' voting behavior. They find that legislators lobbied by sectional groups (e.g. the chemical industry association) are more likely to vote against their constituents, but legislators lobbied by cause groups (e.g. environmentalists) are less likely to vote against their constituents. However, because their study does not observe interest group positions on specific policies, it cannot directly assess the alignment between interest groups and constituents.

This view of interest groups as distorting democratic responsiveness stands in contrast to a substantial body of research emphasizing the power of constituent preferences in shaping legislative behavior. A long tradition in the study of representation finds that legislators' roll-call votes, committee activity, and other legislative behaviors closely track the preferences of their constituents (Adler and Lapinski, 1997; Clinton, 2006). Extending this line of evidence, Pereira et al. (2025) shows that U.S. local policymakers respond to public opinion on climate change, while Rasmussen and Otjes (2024), in an experimental study of elected officials in Denmark and the Netherlands, find that public opinion exerts a strong and direct influence on politicians' intended voting behavior. In contrast, the influence of interest groups in their study appears limited to reinforcing the positions of legislators already predisposed to share their views (see also Otjes and Rasmussen (Forthcoming)). Consistent with this perspective, congressional staffers report that constituent opinion and communication are among the most important factors shaping the advice they provide to members of Congress (Hertel-Fernandez, Mildenberger and Stokes, 2019).

The tension between these two perspectives—interest group distortion versus voter-driven responsiveness—raises a central question: when interest groups lobby legislators, are they working against the preferences of constituents, or are they reinforcing them? Prominent theories of lobbying suggests that lobbying involves interest groups providing resources to help aligned legislators push for priorities that the interest group shares (Hall and Deardorff, 2006), or supplying information to legislators (Austen-Smith, 1993; Schnakenberg, 2017). As the literature on legislative representation suggests, if legislators are responsive to their constituents (Butler and Nickerson, 2011), the preferences of their constituents should in part dictate their policy preferences. Then, a natural ally for a group engaging in legislative subsidy or informational lobbying is a legislator whose constituents share the group's preferences.

To pursue this strategy effectively, interest groups need a clear understanding of legislators' constituency preferences on specific issues. It is therefore unsurprising that they frequently

rely on professional polling firms to gauge public opinion in targeted districts and use that information strategically. Political research firms such as Public Opinion Strategies (POS) and Global Strategy Group (GSG) regularly work with interest groups to assess district-level attitudes and tailor messaging. For instance, GSG partnered with Everytown for Gun Safety to survey Illinois voters on Assembly Bill HB 5522, which proposed an assault weapons ban and an increase in the minimum purchasing age (Hinz, 2022). Interest groups use polling data both internally to shape lobbying strategies and externally to persuade lawmakers—offering evidence that can help legislators justify and frame their positions (Loomis, 2003). Hall and Sun (2025) further show that corporations—the most active participants in lobbying—have increasingly invested in hiring policy specialists over the past two decades.

One valuable form of information that interest groups can provide to legislators is insight into whether their constituents—or particular groups within their districts—are likely to support a given policy. Research shows that legislators frequently hold inaccurate perceptions of public opinion in their districts (Broockman and Skovron, 2018; Hertel-Fernandez, Mildenberger and Stokes, 2019; Pereira, 2021). However, when presented with district-specific survey data on policy issues, legislators are more likely to align their votes with constituent preferences (Butler and Nickerson, 2011). If interest groups behave as predicted by the legislative subsidy or informational theories of lobbying—targeting aligned or persuadable lawmakers—then their interactions with legislators may help reduce uncertainty about constituency preferences. Hansen (1991) documents this dynamic in his study of agricultural lobbying in Congress, highlighting the informational role that interest groups can play. As he notes (p. 5):

> Lawmakers operate in highly uncertain electoral environments. They have an idea of the positions they need to take to gain reelection, but they do not know for sure. Interest groups offer to help. In exchange for serious consideration of their policy views, they provide political counsel for members of Congress. They provide political intelligence about the preferences of congressional constituents, and they provide political propaganda about the performance of congressional representatives.

Bringing together voters, politicians, and interest groups reveals a different picture of how lobbying influences democratic representation. While lobbying, especially by business interests, is often viewed as a force that distorts policymaking (Hertel-Fernandez, Mildenberger and Stokes, 2019), the actual impact on legislative responsiveness depends on the alignment between interest group preferences and those of constituents. Prior studies that examine the influence of organized interests either do not measure the policy preferences of interest groups

(Giger and Klüver, 2016), or do not assess whether the groups actually lobby the members or their staff on the specific issues under study (Hertel-Fernandez, Mildenberger and Stokes, 2019). When public opinion shapes whom interest groups choose to lobby, legislators targeted by such groups will systematically differ from those not targeted, complicating inferences from studies that compare outcomes between lobbied and non-lobbied legislators. To assess whether lobbying reduces or enhances democratic representation, we must systematically measure and compare the policy preferences of voters and interest groups on specific issues, identify which legislators are being targeted and on what topics, and evaluate the degree of alignment between interest group agendas and constituency opinion. In the following section, we turn to our empirical strategy and data to address these questions.

## 3 DATA

We combine issue-specific data on the preferences of voters, legislators, and interest groups across four issues: energy and the environment, healthcare, immigration, and trade. Table 1 summarizes the data sources and estimation strategies used to measure the preferences of each actor. The following sections describe each component in detail.

Table 1: Overview of Preference Estimation

| Group | Voters | Interest Groups | Legislators |
|---|---|---|---|
| Issues | Environment, healthcare, immigration, trade | | |
| Data | CES | Maplight | Roll-calls |
| Estimation | IRT with MRP | IRT on joint dataset | |
| Same scale | No | Yes | Yes |
| Level | District-congress-issue | Group-issue | Legislator-issue |

### 3.1 *Public Opinion*

Our primary source of public opinion data is the Cooperative Election Survey (CES). We use issue-specific survey questions to estimate ideological positions at the state and congressional district levels, following the two-stage approach of Tausanovitch and Warshaw (2013). In the first stage, we fit an IRT model to issue-specific survey responses to place individuals who answer different sets of questions on a common scale. We implement the quadratic one-dimensional model of Clinton, Jackman and Rivers (2004) using the algorithms developed by Imai, Lo and Olmsted (2016), and employ matrix factorization to obtain starting values, as in Clinton, Jackman and Rivers (2004). The resulting measures are rotated so that higher

values correspond to policy preferences closer to those of congressional Republicans and standardized to have a mean of 0 and a variance of 1 for each issue. Tables B.1–B.5 list the survey questions, sample sizes, and estimated discrimination parameters. Before fitting the IRT models, we recoded the responses so that positive answers correspond to more conservative positions; correspondingly, the estimated discrimination parameters—which capture the relationship between respondents' ideology and the probability of a positive response—are positive for all questions.

In the second stage, we use multilevel regression with post-stratification (MRP) to adjust for the potential non-representativeness of the CES data. We estimate models with fixed effects for combinations of respondents' race and education, and gender and education, as well as random effects for congressional districts nested within states. We then post-stratify the estimates using race-gender-education distributions from the American Community Survey at the congressional district or state level.

One might be concerned that our specification choices—such as how we scale ideology or whether we adjust for non-representativeness—influence our substantive conclusions. These concerns appear unwarranted. Figures A.1 and A.2 compare district-by-issue estimates of ideology derived from our IRT models with those obtained from factor models (Heckman and Snyder, 1997) and fixed-effects models (as in Fowler and Hall 2016), showing that the three measures are extremely closely correlated. The similarity between the fixed effects and IRT measures increases confidence that the small number of questions per respondent does not bias our estimates of district-level ideology.[1] Similarly, Figure A.3 shows that multilevel regression with post-stratification has little effect on the estimates, which is unsurprising given the large CES sample size.

### 3.2 *Group and Legislator Positions*

To estimate the issue-specific positions of interest groups and legislators, we follow Crosson, Furnas and Lorenz (2020) by combining data on groups' public positions on bills from Maplight with legislators' roll-calls on the final vote on bills.[2] We use the Congressional Research Service's Policy Area coding to classify bills to specific areas. As above, on each issue we estimate the quadratic ideal point model of Clinton, Jackman and Rivers (2004) using the algorithms from Imai, Lo and Olmsted (2016), and rotate the resulting estimates

[1]Note that the fixed effects approach—regressing whether individuals support an issue against individual and issue fixed effects and using the individual fixed effects as measures of ideology—does not suffer from the incidental parameters problem which can affect IRT models with a small number of items.

[2]Maplight's "Bill Positions" dataset documents over 225,000 public statements by more than 14,000 organizations on approximately 14,000 U.S. congressional bills from 2007 to 2021. The dataset compiles organizations' stated positions from websites, press releases, government filings, congressional hearings, and other publicly available sources.

so that higher scores are positively correlated with legislators' first-dimension DW-Nominate scores. This procedure yields directly comparable measures of legislators' and interest groups' preferences on the same ideological scale. We standardize the ideal points so that legislators have a mean of zero and a variance of one for each issue.

Figure 1 shows the distributions of the estimated ideal points across the four issues, separating Republican and Democratic legislators as well as interest groups in the MapLight dataset that do and do not lobby (explained below). Tables B.6–B.9 list the interest groups with the highest and lowest estimated ideal points on each issue. These patterns illustrate the validity of our measure. For instance, pro-immigration groups such as the Immigrant Legal Resource Center and anti-immigration groups like Californians for Population Stabilization appear on the opposite ends of the ideological spectrum. On environmental issues, environmental organizations receive low scores, while energy industry groups receive high ones. The healthcare spectrum ranges from unions and pro-abortion groups (low) to anti-abortion and health insurance industry groups (high). On trade, unions and environmental organizations occupy the low end, whereas libertarian groups and export-oriented industries fall on the high end. Across all issues, lobbying groups tend to occupy more centrist positions than legislators, consistent with Crosson, Furnas and Lorenz (2020).

Figure 1: Legislators Are More Extreme Than Interest Groups

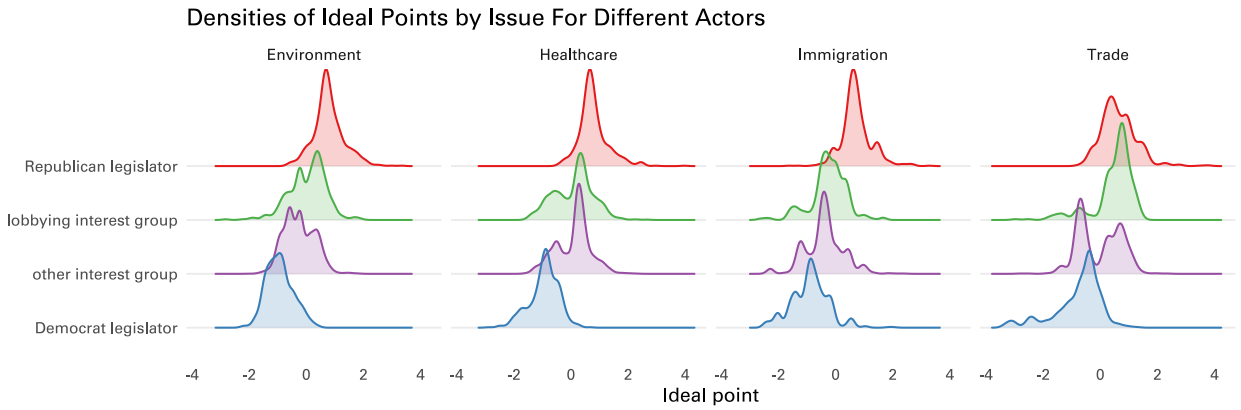
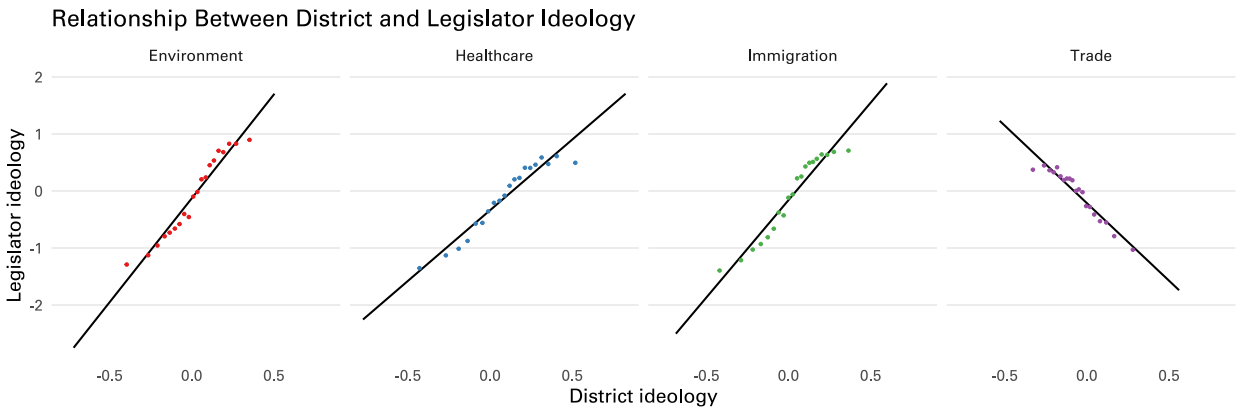



Figure 2 shows that district and legislator issue-specific ideology are strongly correlated on all issues except trade. Table A.1 demonstrates that this positive association is not merely a byproduct of generally conservative districts electing more conservative legislators: it remains robust to the addition of controls for the legislator's first dimension DW-Nominate score, the slope of which we allow to vary by issue, and legislator-period fixed effects. These results increase confidence that district and legislator ideology are meaningfully related: districts

that are more conservative on a specific issue tend to be represented by legislators who are likewise more conservative on that issue.

Figure 2: District and Legislator Ideology Are Positively Correlated




*Notes*: Each figure shows the binned scatterplot of the relationship between district ideology and legislator ideology. Constituency ideology is estimated by running an IRT model on CES survey data; legislator ideology is estimated by running an IRT model on roll-call votes. Lines show OLS fits.

The negative relationship between district and legislator ideology on trade reflects the shifting positions of the parties on trade over the period studied (Keser et al., 2024). We examine this pattern in greater detail in Appendix C. Prior to the 113th congress, Republican legislators were substantially more supportive of free trade, such that more positive legislative ideal points on trade corresponded to voting with the Republican majority. Beginning with the 113th congress, however, legislators with higher trade ideal points tended to vote in a more protectionist direction, as reflected in their reduced alignment with the positions of the Chamber of Commerce (Figure C.4), which Kim and Osgood (2019) identify as a reliable indicator of pro-trade positions. Consistent with these trends, districts that are most supportive of trade—as inferred from survey responses on the Trans-Pacific Partnership and the Trump administration's tariffs—tend to elect Democrats. Across the full period of analysis, district support for trade is positively related to legislators' propensity to vote in line with the Chamber of Commerce's positions (Figure C.5), but not consistently related to legislators' estimated trade ideal points (Figure C.6).

### 3.3 *Lobbying*

Ideally, we would observe direct interactions between interest groups and legislators, but the Lobbying Disclosure Act does not require lobbyists to identify the specific legislators they contact (You, 2020). Instead, we leverage two disclosure requirements: interest groups

must report the lobbyists they hire on each specific lobbying issue, and lobbyists must report the legislators to whom they make campaign contributions. Building on evidence that lobbyists' personal and professional connections to legislators are valuable (Bertrand, Bombardini and Trebbi, 2014; Hirsch et al., 2023), we infer linkages between interest groups and legislators through these contribution networks. Prior research shows that lobbyists command higher fees when connected to key legislators and tend to align their lobbying activities with those legislators' issue specializations (Bertrand, Bombardini and Trebbi, 2014). These patterns suggest that interest groups strategically hire particular lobbyists to reach particular legislators. Following Bertrand, Bombardini and Trebbi (2014), we infer group–legislator connections from contributions made by lobbyists to legislators in a given year, as disclosed under the Lobbying Disclosure Act.

In each year, interest groups are required to disclose the issues they lobbied on, the branch of government targeted, and the lobbyists they hired. We calculate the number of times that each lobbyist contributed to each legislator in the year of each lobbying report. Summing over the lobbyists hired by an interest group to lobby Congress on a given issue during a congressional session yields our measure of lobbying at the interest group-legislator-issue-congress level. More formally, our measure of lobbying connections between an interest group $g$ and a legislator $i$ on a given issue $j$ in congressional cycle $t$ is

$$\textit{Lobbying connections}_{gijt} = \sum_{l} \textit{Reports hiring lobbyist}_{gljt} \cdot \textit{Contributions to legislator}_{lit},$$

where $\textit{Reports hiring lobbyist}_{gljt}$ is the number of Lobbying Disclosure Act reports filed in a given cycle $t$ in which interest group $g$ reports hiring individual lobbyist $l$ to lobby congress on issue $j$, $\textit{Contributions to legislator}_{lit}$ is the number of contributions made by lobbyist $l$ to legislator $i$ in that cycle, and the summation is over lobbyists.[3]

The lobbying data are drawn from the Senate Office of Public Records and Kim (2018). Tables A.2 and A.3 present descriptive statistics on the connections between lobbyists, interest groups, and legislators. The median lobbyist hired on a given issue in a given period is employed by one interest group and contributes to four to five legislators, depending on the issue. The median interest group files four to five lobbying reports on a given issue, hires two distinct lobbyists, and connects to nine to fifteen legislators. Table A.4 reports the average

[3]For instance, a 2013 lobbying report filed by Conrad Law & Policy Counsel reports lobbying Congress on environmental matters on behalf of ExxonMobil, with James Conrad identified as the individual lobbyist (`https://lda.senate.gov/filings/public/filing/f4fc3061-4016-4fb4-89bf-5a6b7eaa9ca6/print/`). In that same year, James Conrad made a campaign contribution to Senator Tim Kaine (`https://lda.senate.gov/api/v1/contributions/62fd5078-ae8a-4bac-a076-3a3db8c24c39/`). Accordingly, in our data this report generates a lobbying connection between ExxonMobil and Senator Kaine in the 113th Congress for the environmental issue area.

number of lobbying connections which we use to measure the intensity of lobbying activity. To further validate our measure, we show in Table A.5 that lobbying connections between an interest group and a legislator are strongly and robustly correlated with whether the interest group lobbies on a bill sponsored by the legislator, which Kim, Stuckatz and Freiheyt (Forthcoming) use to infer lobbying linkages.

### 3.4 *Representativeness of the Maplight Data*

We use Maplight data to infer groups' positions and examine how those positions relate to their lobbying strategies. Two potential concerns arise. First, groups included in the Maplight dataset may not be representative of lobbying groups more generally. Second, groups' publicly stated positions may differ from those they privately advocate through lobbying. We address both concerns in Appendix D. Groups in the Maplight data do lobby more intensively than other groups (Figure D.1), but they do not differ in terms of the ideological orientation or extremism of the districts whose legislators they lobby (Figures D.2 and D.3). Comparing lobbying groups in the Maplight data to those in the dataset from Kim et al. (2025), which infers group positions on bills from lobbying activity, we find similar distributions of estimated ideology (Figure D.5). To the second concern, we show that groups are far more likely to lobby on issues where they take public stances (Table D.2), suggesting that public statements captured by Maplight are complements to rather than substitutes for lobbying. Moreover, we show that the ideology of a group estimated from its public positions in Maplight is highly and positively correlated with the ideology estimated from its lobbying behavior in Kim et al. (2025). Taken together, these results indicate that the Maplight data are broadly representative of major lobbying groups and that groups' public positions closely mirror the preferences they promote privately through lobbying.

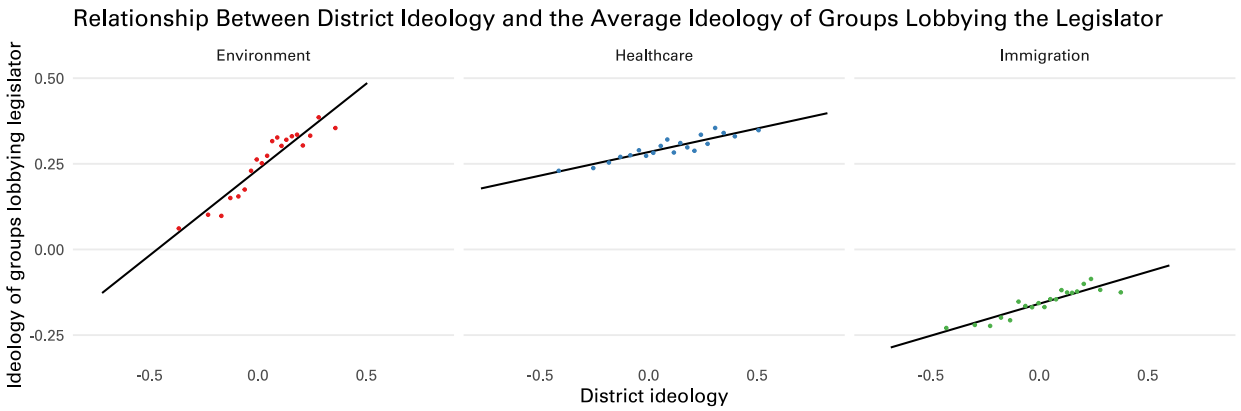
## 4 Alignment between lobbying interest groups and constituents

In this section we analyze how the ideology of the interest groups that lobby a legislator relates to the ideology of her constituents. Using our measures of interest group ideology and lobbying activity, we calculate the average ideology of lobbying groups for each legislator on each issue in each congress. We weight lobbying groups by the number of lobbying connections. We then regress lobbying group ideology on constituent ideology to distinguish between competing models of lobbying. Under a *quid pro quo* model, representatives from more conservative districts should be lobbied by more liberal interest groups, since liberal groups have little incentive to target legislators who already share their preferences. By contrast, under subsidy or informational models, conservative interest groups should lobby conservative

legislators, whose goals they share and whose advocacy they can support through the transfer of resources or information. Similarly, if lobbying serves to persuade legislators by signaling constituent support, we should observe conservative districts being targeted by conservative interest groups.[4]

Figure 3 displays the bivariate relationship between these variables for each issue area. Across issues, legislators representing more conservative districts are, on average, lobbied by more conservative interest groups.

Figure 3: Representatives of More Liberal Districts Are Lobbied by More Liberal Interest Groups On Average




*Notes:* Each figure presents a binned scatterplot showing the relationship between district ideology and the average ideology of interest groups lobbying the legislator, weighted by the number of contributions made by lobbyists hired by each group. Constituency ideology is estimated using an IRT model applied to CES survey data, and interest group ideology is estimated using an IRT model based on group positions on roll-call votes. Note that the two measures are not on the same scale: interest group ideology is standardized so that legislators' ideal points have a mean of 0 and a standard deviation of 1. Lines represent fitted values from OLS regressions.

Because the relationship between district, legislator, and interest group ideology on trade is ambiguous, we exclude trade from the analyses in this and subsequent sections. This

[4]Studying the relationship between district and lobbying group ideology allows us to compare patterns without requiring voters and interest groups to be placed on the same scale. Hill and Huber (2019) caution that voters and legislators inhabit different information environments, making joint scaling challenging. In Appendix A, we also report models based on ideological distance between interest groups and constituents, constructed by placing both on the same scale through regressing legislator ideology on constituent ideology. We find a robust negative association between ideological distance and the probability of lobbying (Table A.6, Figure A.4). Our results suggest substantial ideological alignment: over 70% of lobbying occurs between interest groups and districts within one standard deviation of each other, and over 90% within 1.5 standard deviations (Figure A.5). In our data, slightly over half of interest groups are business associations, and business associations and firms together account for approximately 86% of all groups. We find no clear evidence that different types of interest groups vary systematically in their tendency to lobby legislators with ideologically proximate constituents (Figure A.6)

decision does not affect our substantive conclusions: Appendix F reproduces all these analyses incorporating trade and shows the results are unchanged.

Our preferred regression specification exploits within-district-issue variation in district ideology. We estimate models of the form

$$\textit{Average ideology of groups lobbying}_{ijt} = \beta\, \textit{District ideology}_{ijt} + \gamma_{ij} + \delta_{jt} + \varepsilon_{ijt}, \qquad (1)$$

where $\textit{Average ideology of groups lobbying}_{ijt}$ is the average ideology of groups lobbying the legislator representing district $i$ on issue $j$ in period $t$, $\gamma_{ij}$ is a fixed effect for district $i$ on issue $j$, and $\delta_{jt}$ is a fixed effect for issue $j$ in period $t$. Because all fixed effects are interacted with issue indicators, this specification is equivalent to estimating separate regressions for each issue with district and period fixed effects, and then averaging the coefficients across issues. Within-district, within-issue variation in district ideology is driven by changes in district demographic composition and by shifts in the policy preferences of existing residents. In additional specifications, we add legislator-by-issue fixed effects, which further isolates variation in ideology within a legislator's tenure on a given issue.

One potential concern with estimating equation (1) is that interest groups might themselves influence district ideology. Interest groups may attempt to persuade legislators indirectly by shaping the opinions of their constituents. If such "outside lobbying" were effective, it would raise conceptual challenges for analyzing the representational consequences of lobbying. Research on representation dating back to Miller and Stokes (1963) and Achen (1978) treats constituent preferences as exogenous; the representation of constituent preferences is only meaningful if those preferences are meaningful. However, existing empirical evidence suggests that this concern is limited: field experiments in both the US (Kalla and Broockman, 2022) and Europe (Junk and Rasmussen, 2024) find minimal effects of interest group activity on public opinion.

To further address the concern that interest group influence on district ideology drives our results, we develop an instrument for district ideology that exploits changes in the demographic composition of districts. Using data from the American Community Survey, we divide each district in a given Congress into mutually exclusive and collectively exhaustive demographic cells defined by gender, race, and education. Let $\sigma_{itk}$ denote the share of the population in district $i$ and period $t$ with demographic combination $k$ (e.g., Black female college graduates or Asian male high-school graduates). Because these categories are exhaustive, $\sum_k \sigma_{itk} = 1$ for all $i$ and $t$.

We predict district ideology as a weighted average of baseline ideological preferences by

demographic group:

$$\textit{Demographic-predicted ideology}_{ijt} = \sum_k \sigma_{itk} \cdot \textit{Ideology}_{jkb},$$

where $\textit{Ideology}_{jkb}$ denotes the average ideology on issue $j$ among individuals with characteristics $k$ in base period $b$. Changes in $\textit{Demographic-predicted ideology}_{ijt}$ within a district and issue over time therefore reflects shifts in demographic composition ($\sigma_{itk}$), not ideological change within demographic groups on a given issue, which are held fixed at base-period levels. For example, if college graduates are more supportive of immigration, an increase in the share of college graduates in a district would decrease its $\textit{Demographic-predicted ideology}_{ijt}$ for immigration (recall that more positive values correspond to more conservative positions). However if college graduates in that district—or any other—became more pro-immigration, this would not affect $\textit{Demographic-predicted ideology}_{ijt}$. While interest groups might attempt to influence voters' preferences, it is implausible that they could meaningfully alter the demographic composition of congressional districts.

Table 2 shows the resulting estimates. Model (1) includes issue-period fixed effects, and so uses variation across districts in the same issue. Note that the underlying ideal points on each issue for voters and interest groups are scaled to have standard deviation one (for interest groups, so that legislators' ideal points also have standard deviation of one). The coefficient in Model (1) indicates that a one–standard deviation rightward shift in voter ideology is associated with legislators being lobbied by groups whose average ideology is about one-quarter of a standard deviation more conservative. Model (3) adds district-issue fixed effects, as in Equation (1), yielding a similar coefficient. Model (5) further adds legislator-issue fixed effects, restricting the analysis to variation within a given legislator's tenure—for example, cases where a legislator's district becomes more conservative on a given issue.[5]

Our preferred specifications are the OLS specifications, because existing research suggests it is unlikely that interest groups systematically shape constituent preferences. The two-stage least squares (TSLS) estimates, which are reported in the even-numbered columns, help address concerns about this particular assumption. Across all specifications, the first stage is strong, and Figure A.7 shows that the relationship between predicted and observed district ideology is approximately monotonic. The coefficient on district ideology is positive and, in the more restrictive specifications, somewhat larger than the corresponding OLS estimates, though less precisely estimated.[6] The positive coefficients after isolating variation

[5]The slightly smaller coefficient in this specification is consistent with part of the effect of district ideology on lobbying operating through the replacement of legislators whose views are out of step with their districts.

[6]The larger TSLS coefficients make sense given their interpretation as local average treatment effects: they capture the responsiveness of interest groups to changes in district ideology among districts whose ideological

Table 2: Changes in District Ideology Driven by Demographic Shifts Are Correlated with Changes in the Ideology of Groups Lobbying the Representative

| | Average ideology of groups lobbying | | | | | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| District ideology | 0.253* | 0.244* | 0.222* | 0.384* | 0.100† | 0.326* |
| | (0.022) | (0.030) | (0.055) | (0.069) | (0.053) | (0.145) |
| Model | OLS | TSLS | OLS | TSLS | OLS | TSLS |
| FE: Issue x period | x | x | x | x | x | x |
| - Issue x district | | | x | x | x | x |
| - Issue x legislator | | | | | x | x |
| First stage F-stat | | 118.9 | | 149.2 | | 29.2 |
| N | 11905 | 11900 | 11905 | 11900 | 11905 | 11900 |
| $R^2$ | 0.386 | 0.374 | 0.514 | 0.513 | 0.655 | 0.655 |

*Notes:* This table reports the relationship between issue-specific district ideology and the ideology of groups lobbying a legislator, instrumenting for district ideology with values predicted from district demographics. The data are at the congress-legislator-issue level. The dependent variable is the average issue-specific ideal point of groups lobbying the legislator on the issue in question. The independent variable is district ideology estimated from CES data. Even-numbered models use an instrumental variable equal to the weighted average of ideological positions of different demographic groups in the first period of the analysis, weighted by each group's population share in the district. All models include issue-by-congress fixed effects. Models (3)–(6) add district-by-issue fixed effects, and models (5)–(6) add legislator-by-issue fixed effects. Standard errors clustered by state in parentheses. $^{*}p < 0.05$; $^{\dagger}p < 0.1$.

in district ideology that cannot be influenced by interest groups rules out explanations based on simultaneous manipulation of voters and legislators by organized interests.[7]

shifts are driven by demographic change. Interest groups may respond more strongly to such predictable, demographically driven changes in district opinion than to shifts in attitudes within demographic groups.

[7]The exclusion restriction for the TSLS estimates requires that changes to district demographics only affect the ideology of lobbying groups only through changes in the ideology of the electorate. This assumption could be violated in two ways. First, demographic shifts may coincide with other district-level changes. For example, an increase in the share of college graduates could be accompanied by growth in high-productivity firms that lobby representatives for more liberal immigration policy. Second, as with all two-way fixed effects designs, districts experiencing increases in demographic-predicted ideology may also be subject to differential trends in the ideology of the groups that lobby their representatives. To address these concerns, Table A.7 shows that our results are robust to the inclusion of issue-specific controls for the main demographic components used to construct the instrument (e.g., the share of college graduates or Hispanic residents). These specifications require identification from variation in predicted policy preferences across districts with similar changes in major demographic components but differing changes in the subgroups that comprise those components. For example, they compare districts with similar increases in the shares of college graduates and Hispanic residents but different increases in the share of Hispanic college graduates. The robustness of our estimates to these controls suggests that broad demographic changes correlated with potential threats to the exclusion restriction do not drive our results. Table A.7 further shows that the results are robust to controlling for issue-by-district time trends, which accounts for differential trends in lobbying on specific

LOBBYING CENTRISTS Representatives from more ideologically centrist districts tend to be lobbied more. This pattern is consistent with the evidence presented thus far. Lobbying interest groups tend to be less ideologically extreme than legislators (Figure 1) and typically target representatives of ideologically proximate districts (Table A.6; Figure A.4). Because centrist districts are closer in ideology to most lobbying groups, their representatives are more likely to be lobbied.

However, some *quid pro quo* accounts of lobbying (or "vote buying") also predict that centrist legislators are lobbied more frequently. In these frameworks, centrist legislators—who often represent centrist districts—require less effort to persuade than those firmly opposed to an interest group's position, yet might not support the group's preferred policies in the absence of lobbying.

Table A.8 disambiguates between these competing accounts. Legislators whose districts are closer to the median district on an issue are lobbied more intensively on that issue. However, this association disappears after controlling for the amount of lobbying predicted by the ideological proximity between legislators' districts and lobbying interest groups, or after adding district-by-issue fixed effects. This evidence suggests that centrist legislators attract more lobbying not because they are swing targets in a *quid pro quo* sense, but because they represent districts that are ideologically closer to the median lobbying interest group.

## 5 LOBBYING AND ALIGNMENT WITH VOTERS

Thus far, we have examined the relationship between district ideology and lobbying activity. The main takeaway is that interest groups tend to lobby representatives from ideologically similar districts. This pattern is consistent with either a subsidy mechanism—in which lobbying supports legislators who already share the group's goals without altering representation—or an informational mechanism, whereby groups lobby legislators whose constituents favor an issue to encourage alignment with district preferences. The fact that the ideology of lobbying groups closely tracks that of legislators' constituents suggests that lobbying does not distort, and may even enhance, legislative representation. For lobbying to undermine representation, there would need to be systematic misalignment between the preferences of the lobbying groups and those of constituents. The next section directly examines how lobbying affects the link between constituent preferences and legislators' behavior.

Our measure of representation is the slope of the relationship between district ideology on an issue and legislators' roll-call voting. A vast literature, beginning with Miller and Stokes (1963) and Achen (1978), conceptualizes the quality of representation in this way (see also

issues across districts. The OLS estimates are also robust to these additions, increasing our confidence that they are not driven by spurious trends.

Ansolabehere, Snyder and Stewart 2001; Tausanovitch and Warshaw 2013 and Olson and Rogowski 2024). This slope measures how well legislative behavior adheres to the norm that "Conservative districts should have legislators with right-wing views; liberal districts should be represented by left-wingers" (Achen, 1978, 490).[8] To measure this relationship in observed data, one would scale legislative roll-call votes on a given issue to create an issue-specific measure of legislative ideology and then regress the resulting measure against measured district ideology. The challenge for our purposes is that studying the effects of lobbying requires a comparable measure of counterfactual legislative behavior—how legislators would have voted in the absence of lobbying—on the same ideological scale as the observed measure.

We construct these measures by developing a model of roll-call voting in which a legislator's vote on a given bill reflects her latent ideology and the influence of lobbying by groups supporting or opposing the bill. The model is agnostic about the specific form lobbying takes; it assumes only that lobbying can shift the probability that a legislator votes in favor of a bill. This framework yields an interactive fixed-effects estimating equation. Estimating the model allows us to recover three quantities: the net effect of lobbying on legislative voting, spatial bill parameters, and legislators' latent ideology. The estimated latent ideology represents how legislators would be expected to vote in the absence of lobbying. Using the estimated bill parameters, we then construct a corresponding measure of observed legislative behavior that incorporates the effects of lobbying—defined on the same ideological scale as the counterfactual measure.

With these estimates in hand, we can assess how eliminating lobbying would affect the relationship between district preferences and legislative ideology. We find that the net effect of lobbying is modest but tends to strengthen this relationship, slightly steepening the slope between district preferences and legislators' ideological positions.

THEORETICAL SETUP On a given issue, legislators have quadratic preferences. Legislator $i$'s ideal point is $\lambda_i$.

Legislators vote on a number of bills. Bill $j$ would establish policy $p_j$, replacing the status quo $s_j$. Legislator decisions are shaped by their spatial preferences and by lobbying. The utility that legislator $i$ receives from the passage of bill $j$ is

$$u_{ij}^{p} = -(\lambda_i - p_j)^2 + \beta f_{ij}$$

where $f_{ij}$ is the log number of groups lobbying legislator $i$ *in favor* of the bill. The parameter $\beta$ captures the effectiveness of lobbying in influencing legislative voting, and we expect $\beta \geq 0$:

[8] Achen (1977) criticizes Miller and Stokes (1963)'s use of correlation coefficients in this endeavor, but Achen (1978) proposes the regression coefficient approach as a measure of "responsiveness."

groups rarely lobby in ways that would reduce the probability of a favorable vote. Different theories of lobbying make distinct predictions about the magnitude of $\beta$. Under the *quid pro quo* model, $\beta$ should be large, because lobbying directly shifts legislator's voting behavior. Under legislative subsidy or informational models, $\beta$ should be small, since lobbying provides informational or resource support to allied legislators without altering their underlying preferences or votes.

The utility legislator $i$ receives if the bill fails is

$$u_{ij}^{s} = -(\lambda_i - s_j)^2 + \beta a_{ij} + \varepsilon_{ij},$$

where $a_{ij}$ is the log number of groups lobbying *against* the bill, and $\varepsilon_{ij}$ is an idiosyncratic preference shock that legislator $i$ has for the status quo on bill $j$. The shock term $\varepsilon_{ij}$ is assumed to be independently and identically distributed across legislators and bills, with cumulative distribution function $G(x) = P(\varepsilon_{ij} < x)$.

Legislator $i$ votes for the bill if she receives greater utility from its passage than from maintaining the status quo. Formally, the probability that legislator $i$ votes for bill $j$ is

$$\begin{aligned} P(i \text{ votes for } j) &= P\left(\varepsilon_{ij} < -(\lambda_i - p_j)^2 + (\lambda_i - s_j)^2 + \beta(f_{ij} - a_{ij})\right) \\ &= G\left(2\lambda_i(p_j - s_j) + s_j^2 - p_j^2 + \beta(f_{ij} - a_{ij})\right). \end{aligned} \tag{2}$$

ESTIMATION Writing $\alpha_j = s_j^2 - p_j^2$ and $F_j = 2(p_j - s_j)$, the probability that legislator $i$ votes for bill $j$ can be written as

$$P(i \text{ votes for } j) = G(\alpha_j + \beta(f_{ij} - a_{ij}) + \lambda_i F_j).$$

This equation expresses the probability of a legislator voting in favor of a bill as a function of three components: a bill fixed-effect $\alpha_j$, the net effect of lobbying activity $\beta(f_{ij} - a_{ij})$, and an interaction between a legislator-specific loading $\lambda_i$ and a bill-specific factor $F_j$. The legislator-specific loading $\lambda_i$ corresponds to the legislator's ideal point, while the bill factor $F_j$ captures the relative positions of the proposed policy $p_j$ and the status quo $s_j$. A positive $F_j$ indicates that the proposal has a more positive value than the status quo, so legislators with more positive ideal points are more likely to support it. The magnitude of $F_j$ indicates the ideological distance between the proposal and the status quo: larger absolute values imply that the bill more sharply divides legislators along ideological lines.

The decomposition of roll-call voting into a bill fixed effect and an interactive component is standard in the ideal point estimation literature (Heckman and Snyder, 1997; Clinton, Jackman and Rivers, 2004). Our model extends this framework by incorporating the effects of

lobbying through variables $a_{ij}$ and $f_{ij}$. Different ideal point models make different assumptions about the distribution of the legislator-bill preference shock $\varepsilon_{ij}$, and hence about the functional form of the link function $G$. In Clinton, Jackman and Rivers (2004), $\varepsilon_{ij}$ is assumed to follow either a normal distribution, yielding a probit estimator, or a logistic distribution, yielding a logit estimator. Heckman and Snyder (1997) assume a uniform distribution, resulting in a linear probability model.

If we assume that the distribution of $\varepsilon_{ij}$ is uniform over the $[0, 1]$ interval, following Heckman and Snyder (1997), the model simplifies to the following linear interactive fixed effects equation:

$$y_{ij} = \alpha_j + \beta(f_{ij} - a_{ij}) + \lambda_i F_j + e_{ij}, \tag{3}$$

where $y_{ij}$ is 1 if legislator $i$ votes for bill $j$ and 0 otherwise, and $e_{ij}$ is an error term. This equation differs from a conventional linear regression because of the interactive term, $\lambda_i F_j$: the unobserved legislator ideology ($\lambda_i$) interacts with the unobserved direction and divisiveness of the bill ($F_j$).

Bai (2009) proposes an estimator for interactive fixed-effects models such as Equation (3). We apply Bai's estimation routine to estimate $\beta$ and $\lambda_i$ using least squares. The procedure alternates between estimating $\beta$ by regressing the outcome—roll-call votes—on the covariates $(f_{ij} - a_{ij})$ and estimating the bill and legislator components ($F_j$ and $\lambda_i$) by applying principal components analysis to the residuals from that regression. The dependent variable, residualized with respect to these bill and legislator components, is then used to update the estimate of $\beta$; this process iterates until convergence. Bai shows that the model is identified under standard assumptions normalizing the size and rotation of the factors and loadings. We use the procedures developed by Xu (2017) and Liu, Wang and Xu (2024) to estimate Equation (3).[9]

COMPARISONS The estimated factor loadings $\lambda_i$ correspond to legislators' ideology. In the absence of lobbying—that is, when $f_{ij} - a_{ij} = 0$ for all $i$ and $j$—the probability that legislator $i$ votes for bill $j$ simplifies to $\alpha_j + \lambda_i F_j$. In this sense, $\lambda_i$ provides a counterfactual estimate of each legislator's voting behavior in the absence of lobbying.

To study how lobbying affects legislative behavior, we compare the counterfactual measure representing legislators' behavior in the absence of lobbying to an observed measure of legislative ideology. Using the estimated model parameters, we can construct this observed measure on the same scale as $\lambda_i$. Given estimated $\alpha_j$ and $F_j$ for bills $j = 1, ..., J$, we estimate

[9]Interactive fixed-effects models as estimated by Bai (2009) provide the basis for the Generalized Synthetic Control and Interactive Fixed Effects Counterfactual estimators of Xu (2017) and Liu, Wang and Xu (2024).

it by solving the following least squares problem:

$$R_i = \arg\min_{x_i} \sum_{j=1}^{J} (y_{ij} - \alpha_j - x_i F_j)^2. \tag{4}$$

Intuitively, $R_i$ represents the model's estimate of legislator $i$'s ideal point when the influence of lobbying is not explicitly modeled, that is, when the effects of lobbying are absorbed into the observed relationship between legislators and bills. In this sense, $R_i$ captures legislative behavior *including* the influence of lobbying. By contrast, $\lambda_i$ reflects legislators' ideological positions in the absence of lobbying, netting out the direct effect of lobbying activity.[10] $R_i$ and $\lambda_i$ are measured on the same scale. For legislators who are never lobbied, the two measures coincide—that is $R_i = \lambda_i$. Any differences between $R_i$ and $\lambda_i$ therefore reflect the influence of lobbying.

Because our goal is to assess how lobbying affects the relationship between district opinion and legislative behavior, we regress both $\lambda_i$ and $R_i$ on issue-specific measures of district opinion. Since $R_i$ and $\lambda_i$ are defined on the same scale, differences in the estimated slopes can only be attributed to the influence of lobbying, even though voter and legislator ideology are not measured on the same scale. In the observed data, where lobbying is present, legislator behavior is captured by $R_i$; in the counterfactual scenario without lobbying, it is summarized by $\lambda_i$.

Specifically, we estimate the following two regressions:

$$R_i = \theta_1 + \varphi_1 \, \textit{District ideology}_i + \eta_{1i} \text{ and } \lambda_i = \theta_2 + \varphi_2 \, \textit{District ideology}_i + \eta_{2i}. \tag{5}$$

If $\varphi_1 > \varphi_2$, lobbying causes legislators to behave as though they are more responsive to their constituents: removing lobbying would make legislative behavior less aligned with voter preferences. Conversely, if $\varphi_1 < \varphi_2$, lobbying distorts representation by pulling legislators away from their voters' preferences, and eliminating lobbying would strengthen the alignment between legislators and constituents. In Appendix E.1, we show that under additional assumptions, $\varphi$ corresponds to the weight that legislators place on their voters' preferences when deciding how to vote. In that case, a finding that $\varphi_1 > \varphi_2$ implies that lobbying leads legislators to behave as if they attach greater weight to their constituents' preferences.

[10]The distinction is analogous to estimating the effect of education on income with and without controlling for experience: in the model without experience, the estimated coefficient on education reflects both education and experience; in the model with experience included, it isolates the effect of education alone. Similarly, $R_i$ reflects ideology inclusive of lobbying, while $\lambda_i$ estimates ideology in the absence of lobbying.

ESTIMATES We estimate Equations (3), (4), and (5) separately for each issue area. To ensure model convergence, we restrict the sample to the subset of legislators connected through voting on the same set of bills and to those who have cast votes on at least 10 bills on each issue. Table A.9 reports the numbers of legislators, roll-call votes, and average rates of lobbying for and against. Legislators are lobbied by interest groups supporting or opposing the bill on 19% of roll-calls. There is little evidence of counter-lobbying. In just 2% of roll-calls the legislator is lobbied by groups on both sides of the bill. For inference, we bootstrap the entire estimation procedure, resampling at the state level.

Table 3 reports the estimated $\beta$ coefficients. These coefficients capture the association between being lobbied by groups supporting or opposing a bill and the probability that a legislator votes in favor of that bill, holding fixed the average support for the bill and the the interaction between the legislator's latent ideology and the bill's characteristics. Although these $\beta$ coefficients are not our primary quantities of interest, they are informative about the form lobbying takes. If lobbying operates purely as a legislative subsidy—providing resources or information to allied legislators without changing their positions—we would not expect to observe a positive relationship between lobbying and roll-call voting, conditional on legislator ideology.

Table 3: Estimated Effects of Lobbying on Voting for a Bill.

| Issue | $\beta \times 100$ | 95% CI |
|---|---|---|
| Environment | 0.900 | [0.393, 1.476] |
| Healthcare | 1.818 | [1.267, 2.455] |
| Immigration | 0.701 | [-0.519, 1.97] |

*Notes*: This table reports estimates of $\beta$, the effect of net lobbying by groups supporting a bill on the probability of voting in favor of that bill. Estimates are from the interactive fixed-effects model, with separate $\beta$ coefficient for each issues. Coefficients are multiplied by 100 to ease of interpretation. 95% confidence intervals are calculated using the percentile bootstrap method, clustered by state.

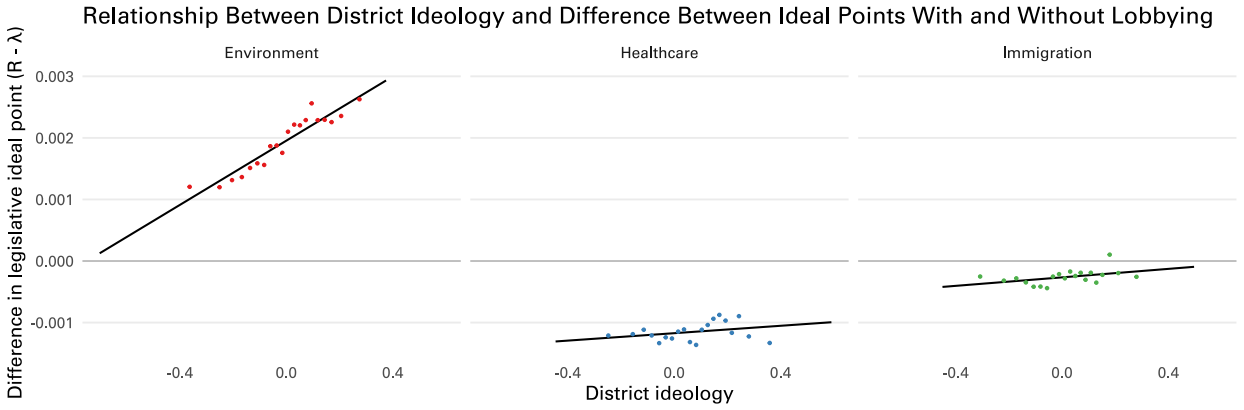
For the environment and healthcare, our estimates indicate that lobbying does influence legislative voting, though the effects are small. On healthcare—the issue with the largest estimated coefficient—a 10% increase in the number of groups lobbying a legislator in favor of a bill corresponds to a 0.2 percentage point increase in the probability of that legislator voting for it.[11] These nonzero estimates suggest that not all lobbying takes the form of a

[11] In Appendix F, we report a slightly larger coefficient for trade.

legislative subsidy. However, the very small magnitudes imply that most lobbying activity likely operates through subsidy-like mechanisms rather than direct persuasion.

Figure 4 plots the difference between observed ideal points inclusive of lobbying and counterfactual ideal points in the absence of lobbying ($R_i - \lambda_i$) against district ideology.[12] A positive slope in Figure 4 indicates that lobbying strengthens the relationship between district ideology and legislators' ideal points. This pattern is most evident for environmental policy, while for the other issues the relationship appears relatively flat. For the environment, the estimated responsiveness gain from lobbying is larger in more conservative districts. In addition to affecting the slope of the relationship between district ideology and legislative behavior, lobbying also shifts its level, although these effects are small in magnitude. Figure 4 suggests that lobbying shifts legislators slightly to the right on environmental issues, but to the left on healthcare and immigration. Appendix E.2 decomposes these effects at the bill level. The leftward shift on healthcare is primarily driven by lobbying in support of the Children's Health Insurance Program Reauthorization Act of 2009 and opposition to efforts to repeal the Affordable Care Act.[13]

Figure 4: The Relationship between District Ideology and Legislative Ideal Points Is Steeper With Lobbying




*Notes*: Each figure displays a binned scatterplot of the relationship between district ideology and the difference in legislator's ideology attributable to lobbying. District ideology (x-axis) is measured using a factor model estimated on CES survey responses. The y-axis represents the difference between legislators' estimated ideal points inclusive of lobbying ($R$) and their counterfactual ideal points in the absence of lobbying ($\lambda$), estimated using an interactive fixed-effects model of roll-call voting.

[12]Figure A.8 presents both sets of ideal points plotted against district ideology across issues. These figures show a positive relationship between district ideology and both measures of ideal points for all issues except trade. Consistent with the small estimated values of $\beta$, the two sets of ideal points are highly similar.

[13]In Appendix F, where trade is included in the analysis, we find that lobbying leads to a leftwards shift in trade policy, driven by lobbying in support of the 2019 Export Finance Agency Act and the 2015 Export-Import Bank Reform and Reauthorization Act.

Table 4 presents regression estimates, with confidence intervals obtained by bootstrapping the entire estimation procedure. Overall, legislators' ideal points inclusive of lobbying are more strongly associated with district ideology than their ideal points in the absence of lobbying. This pattern implies that removing lobbying would weaken the relationship between constituents and legislators. The effect is primarily driven by lobbying on environmental issues.

Table 4: Lobbying Aligns Legislator Behavior With Voter Preferences

| Legislator ideal point: | Inclusive of lobbying ($R_i$) | | Net of lobbying ($\lambda_i$) | | Difference $(R_i - \lambda_i) \times 100$ | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| District ideology | 1.622* | | 1.621* | | 0.093* | |
| | [1.554; 1.736] | | [1.552; 1.735] | | [0.031; 0.148] | |
| × issue = Environment | | 1.804* | | 1.802* | | 0.230* |
| | | [1.718; 1.932] | | [1.714; 1.929] | | [0.090; 0.393] |
| × issue = Healthcare | | 1.291* | | 1.291* | | 0.018 |
| | | [1.209; 1.418] | | [1.209; 1.418] | | [−0.048; 0.084] |
| × issue = Immigration | | 1.864* | | 1.864* | | 0.033 |
| | | [1.774; 2.015] | | [1.775; 2.014] | | [−0.033; 0.132] |
| FE: Issue-period | x | x | x | x | x | x |
| N | 14278 | 14278 | 14278 | 14278 | 14278 | 14278 |
| $R^2$ | 0.459 | 0.471 | 0.459 | 0.471 | 0.404 | 0.408 |

*Notes:* This table examines the relationship between district ideology and legislators' ideal points, estimated using factor models. The unit of analysis is legislator-congress-issue. In models (1)–(2), the dependent variable is the legislator's revealed preference ideal point inclusive of the lobbying ($R_i$), in (3)–(4) the legislator's ideal point net of lobbying ($\lambda_i$), in (5)–(6) the difference between them ($R_i - \lambda_i$), multiplied by 100 for legibility. The independent variable is the district's ideology, in even-numbered models the coefficient varies by issue. All models include issue-by-congress fixed effects. 95% percentile bootstrap confidence intervals clustered by state in brackets. * Null hypothesis value outside the confidence interval.

In estimating the parameters ($\beta$ and $\lambda_i$), the key identification assumption is that the error term ($e_{ij}$) is uncorrelated with lobbying activity ($f_{ij} - a_{ij}$), after controlling for the interaction between legislators' latent ideology and bill characteristics ($\lambda_i F_j$), and for average support for the bill ($\alpha_j$). Our estimation strategy permits lobbying activity to be correlated with legislator ideology—an important feature given the evidence presented in earlier sections that lobbying is systematically related to both legislator and district ideology. This identification assumption is weaker than that required under a standard two-way fixed effects framework. If $F_j = 1$ for all bills, Equation (3) is equivalent to two-way fixed effects. Relative to that framework, our approach does not require that each bill separates legislators along ideological lines in the same way. As Xu (2017) demonstrates, incorporating interactive fixed effects

relaxes the parallel trends assumption that underpins traditional difference-in-differences.

The most plausible threat to our identification assumption arises if interest groups target legislators based not only on their ideology, but also on their idiosyncratic preferences for specific bills (the $\varepsilon_{ij}$ term in Equation (2)). If groups supporting a bill focus their lobbying on legislators who, for reasons unrelated to their ideology on the issue in question, are already more inclined to support the bill, our estimate of $\beta$ would be biased upward. Conversely, if such groups tend to lobby legislators who are less likely to support the bill, our estimate of $\beta$ would be biased downward.

While either form of endogeneity could affect our estimates of $\beta$, it would not alter our substantive conclusions about the effect of lobbying on representation. In Figure A.9, we replicate Figure 4, re-estimating $\lambda_i$ and $R_i$ while fixing $\beta$ at half and twice its estimated value. The resulting patterns are nearly identical, differing only in magnitude. Changing the assumed effectiveness of lobbying does not affect our conclusions about how lobbying influences the relationship between voters and legislators because that conclusion depends on the pattern of lobbying activity relative to district ideology—an empirical relationship that is invariant to the scale of $\beta$.

PREDICTING ROLL-CALL VOTES WITH DISTRICT PREFERENCES Up to this point, we have assessed representation by examining the slope of the relationship between district ideology and legislators' roll-call behavior. An alternative approach is to measure representation by the extent to which district ideology can predict individual roll-call votes. If legislators are responsive to their constituents, then district ideology alone should correctly predict a substantial share of their votes.

Equation (3) defines a data-generating process for roll-call votes, in which the probability that legislator $i$ votes for bill $j$ depends on a bill fixed effect ($\alpha_j$), the interaction between the legislator's ideal point and the relative positions of the status quo and proposal ($\lambda_i F_j$), and net effect of lobbying $\beta(f_{ij} - a_{ij})$. Using the estimated parameters, we simulate additional roll-call votes under two scenarios—with and without lobbying. We then compare the share of correctly predicted votes under each scenario to assess how lobbying affects representational accuracy. Specifically, we run 1,000 simulations in which, for each bill, we generate a predicted vote for each legislator according to the following probabilities:

$$\begin{aligned} P(i \text{ votes for } j \text{ with lobbying}) &= \alpha_j + \lambda_i F_j + \beta\left(f_{ij} - a_{ij}\right), \\ P(i \text{ votes for } j \text{ without lobbying}) &= \alpha_j + \lambda_i F_j. \end{aligned}$$

In these simulations, we use the observed pattern of lobbying activity across bills, along

with the estimated bill and legislator parameters. For comparability across issues, we orient each simulated roll-call so that a vote in favor of a bill corresponds to a more conservative position, based on the sign of the estimated bill parameter $F_j$. We then regress the simulated roll-call outcomes for each issue on district ideology for that issue, including period fixed effects. Our primary quantities of interest are the shares of correctly predicted votes, averaged across the 1,000 simulations, under the scenarios with and without lobbying. For inference, we bootstrap the entire estimation procedure—including the estimation of bill and legislator parameters—clustering by state.

Table 5 presents the results of this exercise. The logistic regression using district ideology correctly predicts roughly three-quarters of roll-call votes generated under the observed level of lobbying. When we simulate roll-calls setting lobbying to zero, the share of correctly predicted votes decreases slightly—by about 0.04 percentage points—but this difference is statistically significant. In other words, when lobbying influences roll-call voting, district ideology becomes a marginally better predictor of legislators' behavior.

Table 5: District Ideology Predicts Roll-call Votes Slightly Better When Lobbying Is Included in the Data-generating Process

| | % Roll-calls classified correctly | 95% CI |
|---|---|---|
| With lobbying | 74.334 | [70.498, 75.492] |
| Without lobbying | 74.295 | [70.451, 75.457] |
| Difference | 0.039 | [0.008, 0.08] |

*Notes:* This table reports the results of simulating roll-call votes from data-generating processes that either include or exclude lobbying, and then predicting these roll-calls using district ideology on the issue in question. The first row shows the percentage of correctly predicted roll-call votes from a logit model using district ideology, where votes are generated under the lobbying-inclusive process described in Equation (3). The second row reports the same measure when lobbying is set to zero. The third row gives the difference between the two. The right column presents 95% bootstrap percentile confidence intervals, clustered by state.

## 6 LOBBYING, LEGISLATIVE EFFECTIVENESS, AND ISSUE PRIORITIZATION

We have evaluated legislative responsiveness through the lens of roll-call voting across four issue areas. Yet voting captures only one dimension of representation. Legislators also exercise discretion in determining which issues to prioritize, and these agenda-setting choices are central to democratic responsiveness. Given the severe time constraints members of Congress face, lobbying may influence not only how legislators vote but also what they choose to work on. Even when legislators' policy positions align with voter preferences, interest groups can

shape the legislative agenda by supplying information and resources that elevate certain issues. In this sense, lobbying may not alter policy stances but can still affect representation by shifting the relative attention legislators devote to different issues.

To address this question, we begin by examining the relationship between issue-specific lobbying and legislative effectiveness. Legislative effectiveness scores capture both the volume of legislation a member introduces and the extent to which that legislation advances toward enactment (Volden and Wiseman, 2014, 2018). We assess how lobbying on a given issue relates to legislators' effectiveness on that same issue. Table 6 reports the results. Across the first three models, we find a strong positive correlation between lobbying and legislative effectiveness. This relationship may arise because interest groups strategically target legislators who are already effective and therefore well positioned to influence policy, or because lobbying enhances legislative effectiveness by providing additional resources and expertise. While we avoid drawing causal conclusions from this association, the relationship is highly robust. As shown in Table A.10, this relationship is robust to the addition of (a) legislator-by-period fixed effects to account for certain legislators being more effective in general, (b) legislator-by-issue time trends to capture certain legislators becoming more effective on a given issue over time (e.g., due to seniority or experience), and (c) issue-by-congress specific controls including third degree polynomials in the legislator's first dimension DW-Nominate score and the district's issue-specific ideology, which adjust for shifts in congressional composition or the issue-specific policy environment that may increase the likelihood of legislative success.

However, lobbying may also entail trade-offs. Intensive lobbying on one issue could reduce a legislator's effectiveness on others by diverting limited time and attention. Models (4)–(6) provide evidence consistent with this possibility. Controlling for the extent to which a legislator is lobbied on a particular issue, higher lobbying activity on other issues is associated with lower legislative effectiveness on that issue, although this negative relationship attenuates when issue-by-legislator fixed effects are included.

Issue-specific legislative effectiveness captures both the extent to which legislators prioritize an issue through bill introductions and their success in advancing those bills through the legislative process. Table A.11 helps disentangle these components by examining the relationship between lobbying and (a) the number of bills introduced, and (b) the number of bills enacted, conditional on the number introduced. The number of bills introduced reflects the attention legislators allocate to an issue, whereas the passage rate more directly captures their influence within Congress on that issue. We find strong positive associations between lobbying and both outcomes. However, the negative relationship between lobbying on other issues and legislative effectiveness arises only for the number of bills introduced, not for bills passed into law. This pattern is consistent with the idea that lobbying on competing issues

Table 6: Being Lobbied on a Given Issue Is Positively Correlated with Legislative Effectiveness on That Issue, While Lobbying on Other Issues Is Negatively Associated with Effectiveness

| | Log issue-specific legislative effectiveness | | | | | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Log lobbying connections | | | | | | |
| on issue | 0.070* | 0.055* | 0.047* | 0.155* | 0.099* | 0.059* |
| | (0.006) | (0.006) | (0.007) | (0.012) | (0.009) | (0.011) |
| on other issues | | | | −0.099* | −0.051* | −0.016 |
| | | | | (0.010) | (0.009) | (0.011) |
| FE: Issue x congress | x | x | x | x | x | x |
| - Issue x district | | x | x | | x | x |
| - Issue x legislator | | | x | | | x |
| N | 11518 | 11518 | 11518 | 11518 | 11518 | 11518 |
| $R^2$ | 0.029 | 0.299 | 0.529 | 0.042 | 0.301 | 0.529 |

*Notes:* This table shows the relationship between being lobbied on different issues and issue-specific legislative effectiveness. Data are at the congress-legislator-issue level. The dependent variable is the legislator's log issue-specific legislative effectiveness score. The independent variable in models (1)–(3) is the log number of lobbying connections on that issue and period, that is, the number of contributions made to the legislator by lobbyists hired to lobby on that issue, (4)–(6) includes the same but for the other two issues. All models include issue-by-congress fixed effects, (2)–(3), and (5)–(6) add issue-by-district fixed effects, (3) and (6) issue-by-legislator fixed effects. Standard errors clustered by legislator in parentheses. $^{*}p < 0.05$; $^{\dagger}p < 0.1$.

diverts legislators' time and attention, but does not reduce their capacity to navigate the legislative process on other topics.

Another potential concern is that lobbying may divert legislators' attention away from issues their constituents care most about. To evaluate this possibility, Table A.12 examines the relationship between the importance voters assign to an issue and the extent to which their representatives are lobbied on that issue. If lobbying pulled legislators' priorities away from constituent priorities, we would expect a negative relationship. Instead, we find no systematic association between voter-reported issue importance and lobbying intensity.[14]

## 7 CONCLUSION

Our findings challenge the widespread view that lobbying inherently distorts democratic representation. Rather than seeking to pull legislators away from their constituents' preferences,

[14]This result should be interpreted with caution because survey-based measures of issue importance are typically noisy. Consistent with this concern, we also do not observe a clear correlation between constituent issue importance and legislators' effectiveness on the corresponding issue (Table A.13).

we show that interest groups tend to focus their efforts on legislators whose districts already share their policy orientations. This pattern suggests that interest groups strategically engage in lobbying where they are most likely to reinforce, rather than redirect, legislative behavior. Consistent with this intuition, our structural model of roll-call voting shows that lobbying exerts a modest but systematic influence in the direction of constituency opinion. We also find no robust evidence that lobbying on specific issues reduces legislators' effectiveness on other issues or diverts their attention away from the issues their constituents prioritize. Taken together, these results imply that lobbying operates less as a corrupting force and more as a mechanism that amplifies existing connections between voters and legislators.

Why, then, do interest groups devote such substantial resources to lobbying if its effects on roll-call voting are limited? One plausible explanation is that lobbying does not influence how legislators vote on roll calls but does influence which legislators are effective in formulating policy. Groups that lobby can still skew policy towards their preferences by providing resources to legislative allies. This explanation is consistent with the legislative subsidy account that we find broad support for, and with our evidence that lobbied legislators tend to be more effective. It also implies an important distinction between lobbying's effects on dyadic and system-level representation. Although our results indicate that lobbying can enhance dyadic representation—that is, the alignment between an individual legislator and her constituents—it may still distort representation at the aggregate level. As Hall and Deardorff (2006) argue, lobbying tends to benefit legislators whose policy goals already align with those of organized interests by subsidizing their legislative efforts. Consequently, legislators representing constituencies whose views coincide with those of well-resourced groups are better positioned to advance those issues. By contrast, issues favored by constituents lacking equivalent organizational support receive less legislative attention—not because their representatives are unresponsive, but because their allies lack sufficient resources to compete. Thus, democratic distortion can arise through the unequal distribution of policy effort across issues and districts, without any individual legislator being "captured." Examining how the distribution of group resources across issues and the alignment of group and public preferences evolve over time is a promising direction for future research on the divergence between dyadic and system-level representation.

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# Online Appendix for Lobbying and Legislative Representation

**Table of Contents**

# A ADDITIONAL TABLES AND FIGURES

## A.1 *Tables*

| | Legislator ideology | | | | | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| District ideology | 3.737* | 0.702* | 0.298* | 3.235* | 0.653* | 0.354* |
| | (0.115) | (0.063) | (0.090) | (0.097) | (0.066) | (0.079) |
| Including trade | | | | x | x | x |
| FE: Issue x period | x | x | x | x | x | x |
| - Period x legislator | | | x | | | x |
| Controls: Issue x Nominate | | x | x | | x | x |
| N | 16125 | 16123 | 16123 | 18761 | 18759 | 18759 |
| $R^2$ | 0.452 | 0.867 | 0.928 | 0.315 | 0.835 | 0.899 |

This table presents evidence of the relationship between district and legislator ideology. Data is at the congress-legislator-issue level. The dependent variable is the legislator's ideology on the issue, inferred from roll-call votes, the independent variable is the district's ideology, as estimated by MRP from CES data. All models include issue-by-congress fixed effects, (2)–(3) and (5)–(6) control for the legislator's Nominate first-dimension score interacted with the issue, (3) and (6) include congress-by-legislator fixed effects. Models (4)–(6) also include trade as one of the issues. Standard errors clustered by state in parentheses. $^{*}p < 0.05$; $^{\dagger}p < 0.1$.

Table A.1: Issue-specific legislator ideology correlates with district ideology

| | Interest groups | | Legislators | | Contributions | |
|---|---|---|---|---|---|---|
| Issue | Mean | Median | Mean | Median | Mean | Median |
| Environment | 2.00 | 1 | 11.86 | 5 | 17.11 | 6 |
| Healthcare | 3.66 | 1 | 10.36 | 4 | 14.81 | 5 |
| Immigration | 1.66 | 1 | 11.78 | 5 | 16.80 | 6 |
| Trade | 2.31 | 1 | 11.62 | 5 | 16.29 | 6 |

This table reports descriptive statistics for connections between lobbyists and interest groups and legislators. The first set of columns gives the average number of interest groups that hire a lobbyist to lobby on a given issue in a given period, the second gives the average number of legislators to whom a lobbyist hired on an issue in a period contributes, the third gives the average distinct number of contributions.

Table A.2: Lobbyist-level mean and median connections between lobbyists and interest groups and legislators

| | Reports | | Lobbyists | | Legislators | |
|---|---|---|---|---|---|---|
| Issue | Mean | Median | Mean | Median | Mean | Median |
| Environment | 5.69 | 4 | 2.69 | 2 | 27.57 | 10 |
| Healthcare | 7.61 | 5 | 3.82 | 2 | 35.29 | 15 |
| Immigration | 5.70 | 4 | 2.98 | 2 | 28.42 | 9 |
| Trade | 6.35 | 4 | 3.65 | 2 | 37.57 | 13 |

This table reports descriptive statistics for lobbying activity by interest groups on each issue. The first group of columns gives the average number of reports filed on a given issue in a given period by a group lobbying on that issue in that period, the second gives the average number of unique lobbyists listed in reports filed by a group lobbying, the third gives the number of unique legislators contributed to by lobbyists hired.

Table A.3: Interest group-level mean and median connections to lobbyists and legislators

| | Reports | | × Lobbyists | | × Legislators | | × Contributions | |
|---|---|---|---|---|---|---|---|---|
| Issue | Mean | Median | Mean | Median | Mean | Median | Mean | Median |
| Environment | 5.69 | 4 | 11.57 | 7 | 130.77 | 32 | 175.89 | 42 |
| Healthcare | 7.61 | 5 | 17.81 | 8 | 196.02 | 48 | 259.85 | 64 |
| Immigration | 5.70 | 4 | 12.86 | 6 | 138.59 | 26 | 181.75 | 31 |
| Trade | 6.35 | 4 | 15.86 | 8 | 189.40 | 40 | 245.77 | 52 |

This table reports descriptive statistics for lobbying activity by interest groups on each issue. The first group of columns gives the average number of reports filed on a given issue in a given period by a group lobbying on that issue in that period, the second gives the number of reports multiplied by the number of lobbyists listed in those reports, the third gives the number of reports multiplied by the number of lobbyists multiplied by the number of legislators to whom the lobbyists contribute, the fourth gives the number of reports multiplied by the number of lobbyists multiplied by the number of distinct contributions to legislators by those lobbyists.

Table A.4: Interest group-level cumulative mean and median connections to lobbyists and legislators

| | Bill connection (relative to average) | | | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| Log lobbying connections | 1.155* | 0.859* | 0.522* | 0.234* |
| | (0.137) | (0.091) | (0.061) | (0.030) |
| FE: Issue x period | x | | | |
| - Issue x group x period | | x | x | x |
| - Issue x legislator x period | | | x | x |
| - Issue x group x legislator | | | | x |
| N | 3853857 | 3853857 | 3853857 | 3853857 |
| $R^2$ | 0.010 | 0.047 | 0.134 | 0.468 |

This table presents evidence that lobbying connections correlate with another proxy for lobbying: whether the interest group lobbies on a bill sponsored by the legislator. Data is at the interest group-legislator-issue-congress level. The dependent variable is an indicator that the interest group lobbies on the issue on a bill sponsored by a legislator, scaled by the average rate of such connections across dyads. The independent variable is the log number of lobbying connections between the interest group and legislator, on that issue in that period. A coefficient of 1 would indicate that a log unit increase in lobbying connections corresponds to an increase in the probability of a bill connection that is 100% of the base rate of such connections. Model (1) includes issue-by-period fixed effects, (2) adds issue-by-group-by-period fixed effects, which subsume issue-period fixed effects, (3) adds issue-by-legislator-by-period fixed effects, (4) issue-dyad fixed effects. Standard errors clustered by interest group and legislator in parentheses. $^*p < 0.05$; $^\dagger p < 0.1$.

Table A.5: Lobbying connections strongly predict bill-based proxies for lobbying

| | Lobbied (x100) | | | | | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Distance to district ideology | −1.464* | −1.021* | −0.525* | −0.301* | −1.011* | −0.370* |
| | (0.219) | (0.180) | (0.130) | (0.134) | (0.179) | (0.140) |
| Distance to legislator ideology | | | −0.570* | | | |
| | | | (0.167) | | | |
| Including Trade | | | | | x | x |
| FE: Issue x group x period | x | x | x | x | x | x |
| - Issue x legislator x period | | x | x | x | x | x |
| - Issue x group x legislator | | | | x | | x |
| N | 3084512 | 3084512 | 3075143 | 3084512 | 3481764 | 3481764 |
| $R^2$ | 0.175 | 0.245 | 0.246 | 0.592 | 0.251 | 0.602 |

This table presents evidence that an interest group is less likely to lobby legislators whose constituents are ideologically further from the interest group. Data is at the interest group-legislator-issue-congress level. The dependent variable is an indicator that the interest group hires a lobbyist who contributed to the legislator to lobby on the issue in question, multiplied by 100 to aid interpretation. The independent variable is the difference between the interest group's issue-specific ideal point, and the legislator's constituency ideal point, estimated by regressing the legislator ideal points against constituency ideal points. All models include issue-by-interest group-by congress fixed effects, (2)–(6) add issue-by-legislator-by-congress fixed effects. (3) also controls for the difference between the legislator and interest group ideal points, (4) and (6) add legislator-by-interest group-by-issue fixed effects. (5) and (6) include the trade issue. Standard errors clustered by state and interest group in parentheses. $^*p < 0.05$; $^\dagger p < 0.1$.

Table A.6: Interest groups lobby legislators whose constituents agree with them

| | Average ideology of groups lobbying | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) |
| District ideology | 0.205* | 0.370* | 0.230* | 0.458* | 0.221* | 0.406* | 0.220* | 0.382* | 0.200* | 1.566* | 0.191* | 0.371* | 0.173* | 1.688† |
| | (0.048) | (0.088) | (0.059) | (0.076) | (0.055) | (0.067) | (0.057) | (0.067) | (0.052) | (0.529) | (0.079) | (0.146) | (0.073) | (0.862) |
| Model | OLS | TSLS | OLS | TSLS | OLS | TSLS | OLS | TSLS | OLS | TSLS | OLS | TSLS | OLS | TSLS |
| FE: Issue x period | x | x | x | x | x | x | x | x | x | x | x | x | x | x |
| - Issue x district | x | x | x | x | x | x | x | x | x | x | x | x | x | x |
| Controls: % College x issue | x | x | | | | | | | x | x | | | x | x |
| - % Black x issue | | | x | x | | | | | x | x | | | x | x |
| - % Hispanic x issue | | | | | x | x | | | x | x | | | x | x |
| - % Male x issue | | | | | | | x | x | x | x | | | x | x |
| - District x issue trends | | | | | | | | | | | x | x | x | x |
| First stage F-stat | | 274.1 | | 104.9 | | 328.7 | | 134.1 | | 8.5 | | 58.2 | | 19.6 |
| N | 11900 | 11900 | 11900 | 11900 | 11900 | 11900 | 11900 | 11900 | 11900 | 11900 | 11905 | 11900 | 11900 | 11900 |
| $R^2$ | 0.515 | 0.513 | 0.514 | 0.513 | 0.514 | 0.513 | 0.514 | 0.513 | 0.515 | 0.514 | 0.620 | 0.620 | 0.621 | 0.621 |

This table reports the relationship between issue-specific district ideology and the ideology of groups lobbying a legislator, instrumenting for district ideology with values predicted from district demographics. The data are at the congress-legislator-issue level. The dependent variable is the average issue-specific ideal point of groups lobbying the legislator on the issue in question. The indepenent variable is district ideology estimated from CES data. Even-numbered models use an instrumental variable equal to the weighted average of ideological positions of different demographic groups in the first period of the analysis, weighted by each group's population share in the district. All models include issue-by-congress and district-by-issue fixed effects, as in Table 2, models (3) and (4). Models (1) and (2) control for the share of college graduates in the district, allowing the slope of that relationship to vary by issue area, (3) and (4) do the same for the share of Black residents, (5) and (6) for the share of Hispanic residents, (7) and (8) for the share of male residents. (9) and (10) control for all of these demographic shares, allowing each coefficient to vary by issue area. (11) and (12) adds district-by-issue time trends. (13) and (14) include all these additional controls. Standard errors clustered by state in parentheses. $^{*}p < 0.05$; $^{\dagger}p < 0.1$.

Table A.7: Robustness of the relationship between district ideology and the ideology of groups lobbying the representative

| | Log lobbying connections | | | | | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| District distance to median | $-1.144^{*}$ | $-0.500$ | $-0.467$ | $-0.043$ | $-0.093$ | $0.448^{\dagger}$ |
| | (0.261) | (0.316) | (0.309) | (0.318) | (0.184) | (0.243) |
| Predicted log lobbying connections | | $1.264^{*}$ | | $0.866^{*}$ | | $1.176^{*}$ |
| | | (0.321) | | (0.398) | | (0.290) |
| FE: Issue x period | x | x | x | x | x | x |
| - Issue x District | | | x | x | x | x |
| - Issue x Legislator | | | | | x | x |
| N | 12562 | 12562 | 12562 | 12562 | 12562 | 12562 |
| $R^2$ | 0.388 | 0.391 | 0.603 | 0.603 | 0.795 | 0.796 |

This table reports the relationship between issue-specific district ideology and the extent of lobbying. The data are at the congress-legislator-issue level. The dependent variable is log lobbying connections, the log number of contributions to the legislator from lobbyists hired to lobby on the issue, counting lobbyists hired for multiple lobbying efforts multiple times. The main independent variable is the absolute distance between a district's ideology and that of the median district in the corresponding Congress. Models (2), (4), and (6) control for the predicted number of groups lobbying the legislator based on ideological distance between the district and the lobbying interest groups. Predicted log lobbying connections is the log of the sum of lobbying connections predicted from a Poisson regression of lobbying connections against the distance between constituency and interest group ideology at the interest-group-legislator-issue-period level, with interest-group-by-issue-by-period fixed effects. All models include issue-by-congress fixed effects; models (3)–(4) add issue-by-district fixed effects, and models (5)–(6) add issue-by-legislator fixed effects. Standard errors clustered by state in parentheses. $^{*}p < 0.05$; $^{\dagger}p < 0.1$.

Table A.8: Legislators with more centrist districts are lobbied more, but this relationship is attributable to interest groups having centrist preferences and lobbying ideologically-close districts

| Issue | Roll-calls | Legislators | % Lobbied | % both sides | Log for | Log against | Difference |
|---|---|---|---|---|---|---|---|
| Environment | 66579 | 1040 | 22.1 | 1.5 | 0.240 | 0.037 | 0.203 |
| Healthcare | 88298 | 1151 | 18.5 | 2.6 | 0.225 | 0.077 | 0.148 |
| Immigration | 16973 | 731 | 12.4 | 0.2 | 0.106 | 0.051 | 0.056 |
| Trade | 3957 | 332 | 22.8 | 0.0 | 0.346 | 0.000 | 0.345 |
| Total | 175807 | 1154 | 19.4 | 1.9 | 0.222 | 0.058 | 0.164 |

This table reports descriptive statistics related to lobbying on roll-calls used to estimate legislator ideology with and without lobbying. The "Roll-calls" column gives the number of legislator-by-bill roll-call votes used in the estimation, "Legislators" the number of unique legislators. "% Lobbied" gives the percentage of these roll-calls on which the legislator is lobbied by a group supporting or opposing the bill. "% both sides" gives the percentage of roll-calls on which the legislators is lobbied both by groups supporting and those opposing the bill. "Log for" gives the average log (1+) number of groups lobbying the legislator in support of the bill. "Log against" the average log (1+) number of groups lobbying the legislator in opposition of the bill. "Difference" gives the difference between these two, which we use in our estimation.

Table A.9: Number of roll-calls and patterns of lobbying by roll-call

| | Log issue-specific legislative effectiveness | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| Log lobbying connections | 0.077* | 0.054* | 0.055* | 0.054* | 0.053* | 0.053* | 0.057* | 0.051† |
| | (0.018) | (0.026) | (0.027) | (0.027) | (0.015) | (0.021) | (0.022) | (0.026) |
| FE: Issue x congress | x | x | x | x | x | x | x | x |
| - Issue x district | x | x | x | x | x | x | x | x |
| - Issue x legislator | x | x | x | x | x | x | x | x |
| - Legislator x congress | x | x | x | x | x | x | x | x |
| Controls: Legislator time trends | | x | x | x | | x | x | x |
| - Nominate x issue x congress (cubic) | | | x | x | | | x | x |
| - District ideology x issue x congress (cubic) | | | | x | | | | x |
| Sample: Including trade | | | | | x | x | x | x |
| N | 11518 | 11518 | 11515 | 11515 | 15724 | 15724 | 15720 | 13617 |
| $R^2$ | 0.718 | 0.824 | 0.825 | 0.828 | 0.652 | 0.782 | 0.785 | 0.826 |

This table shows the relationship between lobbying activity and legislative effectiveness is robust to the addition of an array of additional fixed effects and controls. Data are at the congress-legislator-issue level. The dependent variable is the legislator's log issue-specific legislative effectiveness score. The independent variable is the log number of lobbying connections on that issue and period. All models include issue-by-congress, issue-by-district, issue-by-legislator, and legislator-by-congress fixed effects. Models (2)–(4) and (6)–(8) add controls for legislator-specific time trends, (3)–(4) and (7)–(8) add issue-by-period specific controls for third-degree polynomials in the legislator's first dimension Nominate score, (4) and (8) add issue-by-period specific controls for third degree polynomials in the district's ideology on the issue in question, estimated from the CES. Models (1)–(4) exclude trade as an issue area, (5)–(8) include it. Standard errors clustered by legislator in parentheses. $^{*}p < 0.05$; $^{\dagger}p < 0.1$.

Table A.10: The relationship between lobbying activity and legislative effectiveness is robust to the addition of a range of additional fixed effects and controls

Table A.11: Being lobbied on a given issue correlates with both bill sponsorship and the number of bills becoming laws

| | Log bills introduced | | | | Log bills passed into law | | | |
|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| Log lobbying connections | | | | | | | | |
| on issue | 0.099* | 0.188* | 0.077* | 0.091* | 0.009* | 0.013* | 0.010* | 0.011* |
| | (0.013) | (0.019) | (0.014) | (0.020) | (0.002) | (0.004) | (0.004) | (0.005) |
| on other issues | | −0.107* | | −0.017 | | −0.005 | | −0.001 |
| | | (0.018) | | (0.021) | | (0.004) | | (0.005) |
| Log bills introduced | | | | | 0.039* | 0.039* | 0.037* | 0.037* |
| | | | | | (0.004) | (0.004) | (0.005) | (0.005) |
| FE: Issue x congress | x | x | x | x | x | x | x | x |
| - Issue x district | x | x | x | x | x | x | x | x |
| - Issue x legislator | | | x | x | | | x | x |
| N | 11518 | 11518 | 11518 | 11518 | 11518 | 11518 | 11518 | 11518 |
| $R^2$ | 0.493 | 0.495 | 0.715 | 0.715 | 0.190 | 0.190 | 0.354 | 0.354 |

This table shows the relationship between being lobbied on two components of legislative effectiveness: bills introduced and bills that successfully become laws. Data are at the congress-legislator-issue level. The dependent variable in models (1)–(4) is the log number of bills introduced, giving substantive bills 5 times the value of commemorative bills, and substantive and significant bills 10 times the value, as in the calculation of legislative effectiveness scores. The dependent variable in models (5)–(8) is the log number of laws enacted, weighting the content as in the other models. The independent variable is the log number of lobbying connections on that issue and period, even-numbered models also include this variable for the other issues. All models include issue-by-congress and issue-by-district fixed effects, (3), (4), (7) and (8) add issue-by-legislator fixed effects. Models examining laws enacted control for the log number of bills introduced (the dependent variable in models (1)–(4)). Standard errors clustered by legislator in parentheses. $^*p < 0.05$; $^\dagger p < 0.1$.

| | Log lobbying connections | | | | | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Issue importance | $-0.214^{\dagger}$ | 0.056 | | | | |
| | (0.119) | (0.075) | | | | |
| Demographic-predicted issue importance | | | $-0.550^{*}$ | $-0.038$ | 0.071 | $-1.287$ |
| | | | (0.219) | (0.181) | (0.471) | (1.133) |
| FE: Issue x period | x | x | x | x | x | x |
| - Period x legislator | | x | | x | | |
| - Issue x district | | | | | x | x |
| - Issue x legislator | | | | | | x |
| N | 3192 | 3192 | 12562 | 12562 | 12562 | 12562 |
| $R^2$ | 0.319 | 0.918 | 0.388 | 0.921 | 0.608 | 0.800 |

This table presents evidence of the relationship between the importance that voters assign to issues in surveys, and the rate at which legislators are lobbied on issues, for the environment, immigration, and healthcare. The dependent variable is the log number of lobbying connections, summing over interest groups. The independent variable in models (1)–(2) is the average importance of the issue for voters surveyed by the CES, coded so that 0 is not important and 4 is very important. Because this data is only available for a limited sample in the 2015 and 2016 waves, in models (3)–(6) we predict issue importance using the demographic mix, using the same strategy as used to generate instruments for district ideology. All models include issue-by-congress fixed effects, (2) and (4) add period-by-legislator fixed effects, (5)–(6) add district-by-issue fixed effects, and (6) adds legislator-issue fixed effects. Standard errors clustered by state in parentheses. $^{*}p < 0.05$; $^{\dagger}p < 0.1$.

Table A.12: Issue-specific lobbying is unrelated to voters' expressed issue importance

| | Log legislative effectiveness | | | | | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Issue importance | −0.093 | 0.031 | | | | |
| | (0.060) | (0.070) | | | | |
| Demographic-predicted issue importance | | | −0.400* | −0.385* | −0.106 | −0.961 |
| | | | (0.135) | (0.143) | (0.195) | (0.737) |
| FE: Issue x period | x | x | x | x | x | x |
| - Period x legislator | | x | | x | | |
| - Issue x district | | | | | x | x |
| - Issue x legislator | | | | | | x |
| N | 3249 | 3249 | 13092 | 13092 | 13092 | 13092 |
| $R^2$ | 0.010 | 0.324 | 0.010 | 0.409 | 0.265 | 0.510 |

This table presents evidence of the relationship between the importance that voters assign to issues in surveys, and the effectiveness of legislators on issues, for the environment, immigration, and healthcare. The dependent variable is the log number of contributions to the legislator from lobbyists hired to lobby on the issue, counting a lobbyist hired to lobby in multiple instances multiple times. The independent variable in models (1)–(2) is the average importance of the issue for voters surveyed by the CES, coded so that 0 is not important and 4 is very important. Because this data is only available for a limited sample in the 2015 and 2016 waves, in models (3)–(6) we predict issue importance using the demographic mix, using the same strategy as used to generate instruments for district ideology. All models include issue-by-congress fixed effects, (2) and (4) add period-by-legislator fixed effects, (5)–(6) add district-by-issue fixed effects, and (6) adds legislator-issue fixed effects. Standard errors clustered by state in parentheses. $^{*}p < 0.05$; $^{\dagger}p < 0.1$.

Table A.13: Issue-specific legislative effectiveness is unrelated to voters' expressed issue importance

## A.2 *Figures*

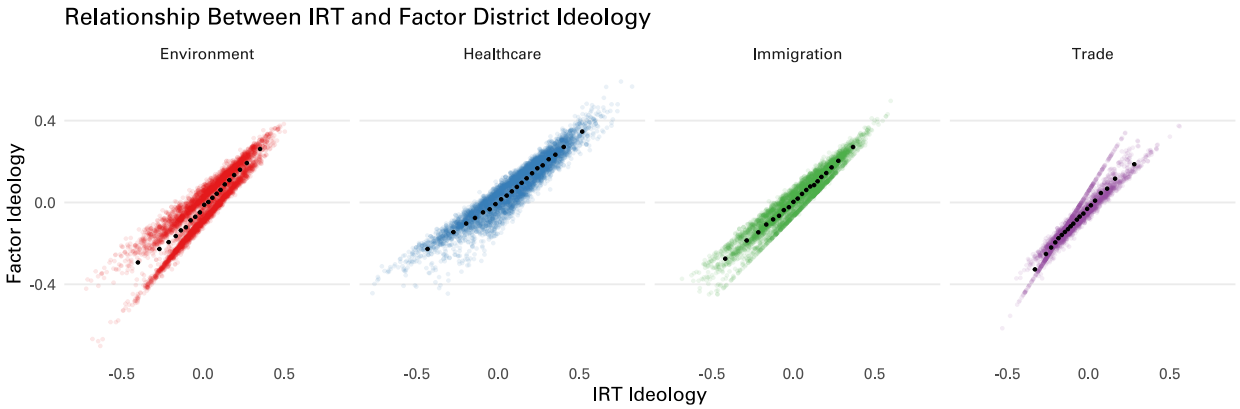


Figure A.1: Comparison of district ideology estimates using IRT and factor models

This figure compares estimates of district ideology from running an IRT model on CES survey data (x axis), to that estimated from running a factor model on the same data (y axis). Both measures correct for non-representativeness using multilevel regression with post-stratification. Black dots are binned averages.

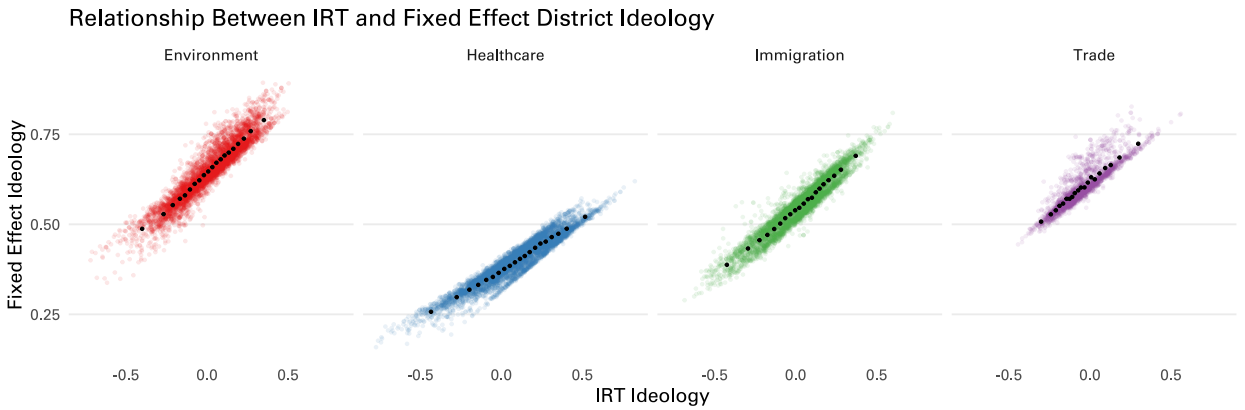


Figure A.2: Comparison of district ideology estimates using IRT and fixed effects models

This figure compares estimates of district ideology from running an IRT model on CES survey data (x axis), to that estimated from running a fixed effects model on the same data (y axis). For this fixed effects model, we regress whether the respondent agrees with the survey question on a survey question and respondent fixed effect, after first recoding the survey questions so that yes answers correspond to more Republican policy preferences. The respondent fixed effect then gives a measure of the respondent's ideology. Both measures correct for non-representativeness using multilevel regression with post-stratification. Black dots are binned averages.

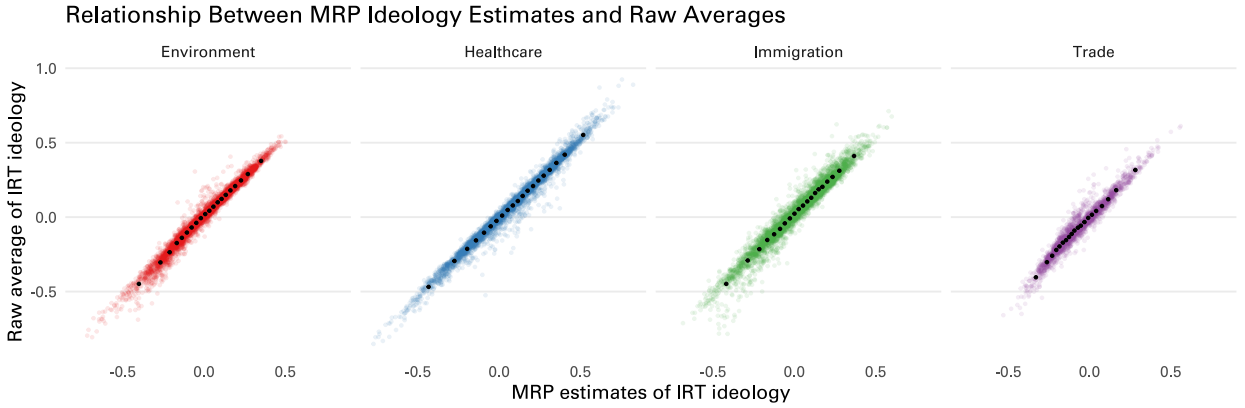


Figure A.3: Comparison of district ideology estimates using multilevel regression and post-stratification against raw averages

This figure compares estimates of district ideology based on IRT estimates from CES survey data. The x axis uses multilevel regression with post-stratification, the y axis plots the averages using CES sampling weights. Black dots are binned averages.

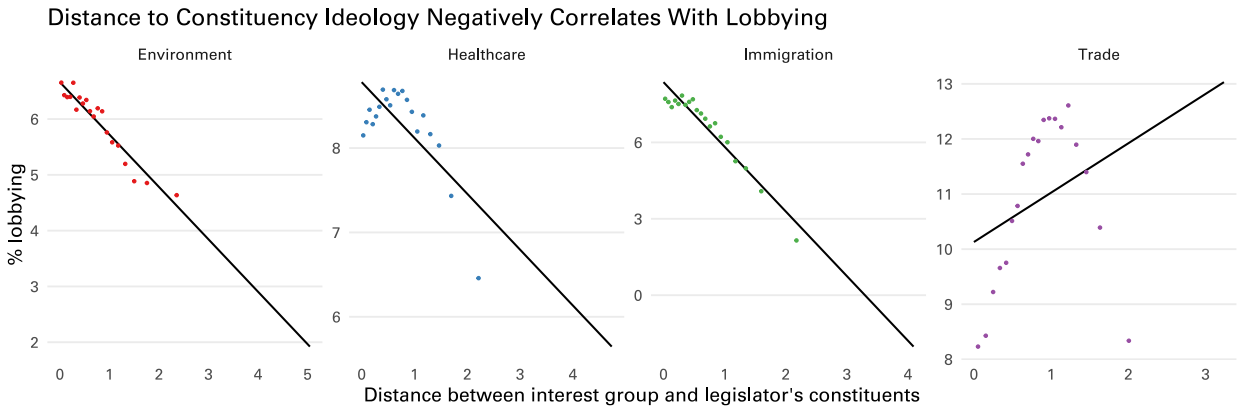


Figure A.4: Interest groups lobby legislators with ideologically close constituents

Each figure shows the binned scatterplot of the relationship between the distance between a given interest group and a given legislator's constituents, and the probability that the interest group lobbies the legislator. Constituency ideology is estimated by running an IRT model on CES survey data; this ideology is then placed on the same scale as interest group ideology by regressing legislator ideology on district ideology. Lines show OLS fits.

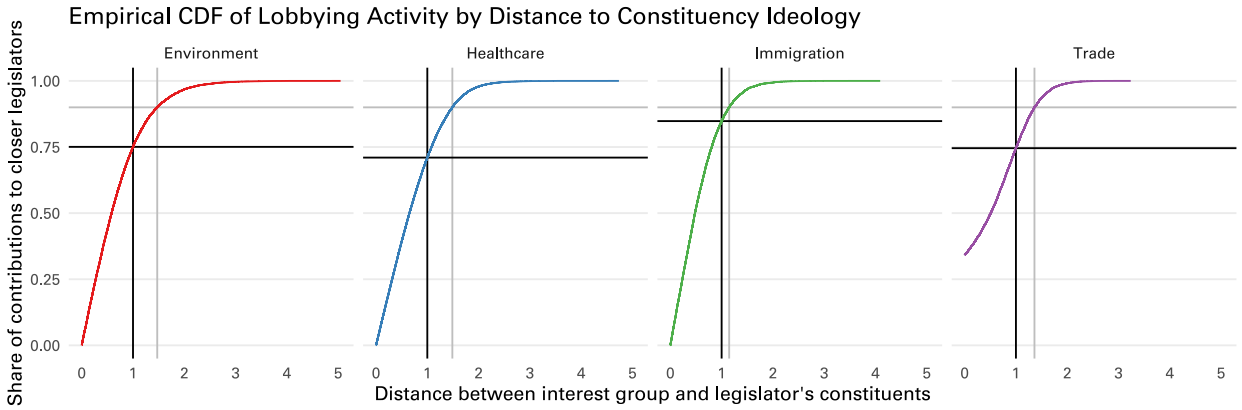


Figure A.5: Most lobbying occurs between interest groups and legislators with ideologically-close districts

Each figure shows the empirical cumulative distribution function of lobbying activity by the district between interest groups and constituency ideology. The y axis shows the share of contributions to legislators by lobbyists hired to lobby on a given issue, for which the distance between the interest group and the legislator's constituency is less than the x axis value. Constituency ideology is estimated by running an IRT model on CES survey data; this ideology is then placed on the same scale as interest group ideology by regressing legislator ideology on district ideology. Black lines show a 1 standard deviation distance between interest groups and districts, gray lines show the 90th percentile of lobbying activity. The share of lobbying activity between groups and districts within one standard deviation of one another is 75%, 71%, 85%, and 75%, for the Environment, Healthcare, Immigration, and Trade, respectively, while 90% of lobbying activity occurs between pairs within 1.47, 1.48, 1.15, and 1.36 standard deviations, respectively.

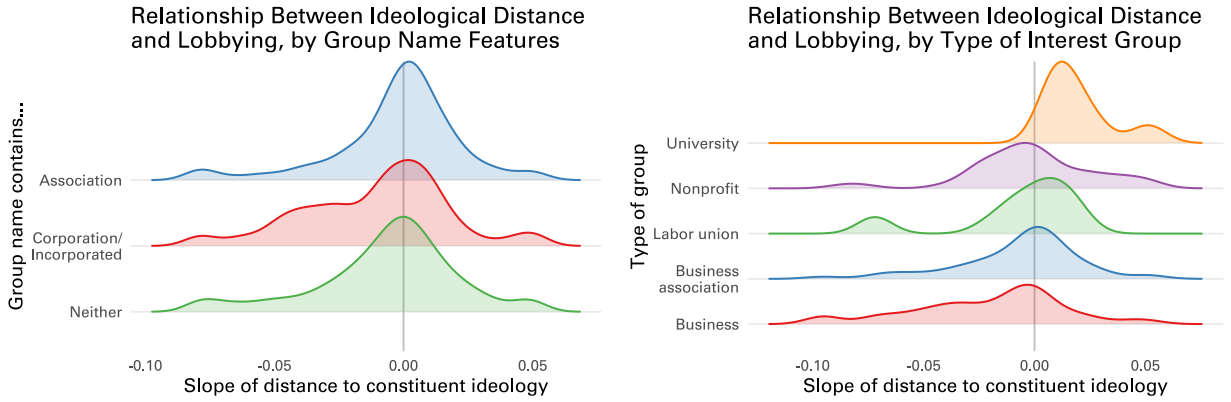


Figure A.6: Distribution of slope of relationship between ideological distance and lobbying, by interest group type

These figures plot the distribution of interest group-specific slopes relating ideological distance to lobbying activity. We estimate the following model:

$$\text{Lobbying connection}_{gijt} = \beta_g \, \text{Distance}_{gijt} + \gamma_{gjt} + \delta_{ijt} + \varepsilon_{gijt},$$

where the dependent variable takes a value of 1 if the interest group $g$ lobbies legislator $i$ on issue $j$ in period $t$, 0 otherwise, the independent variable is the ideological distance between $g$ and $i$'s constituents, and the fixed effects are for interest-group-by-issue-by-period and legislator-by-issue-by-period, as in Table A.6, model (2). Unlike in that table, we allow the slope of the relationship to vary by interest group. The figures plot the distribution of these slope coefficients across interest groups. In the left panel, we automatically classify interest groups based on whether the group name includes "Association," "Corporation" or "Inc" or neither. In the right panel we manually classify the 500 most active interest groups. Each curve is the kernel density for the subgroup in question, winsorized at the 2.5th and 97.5th percentiles for legibility. Of the groups we manually classify, 255 are business associations, 178 are individual businesses, 46 are nonprofits, 15 are labor unions, and 7 are universities.

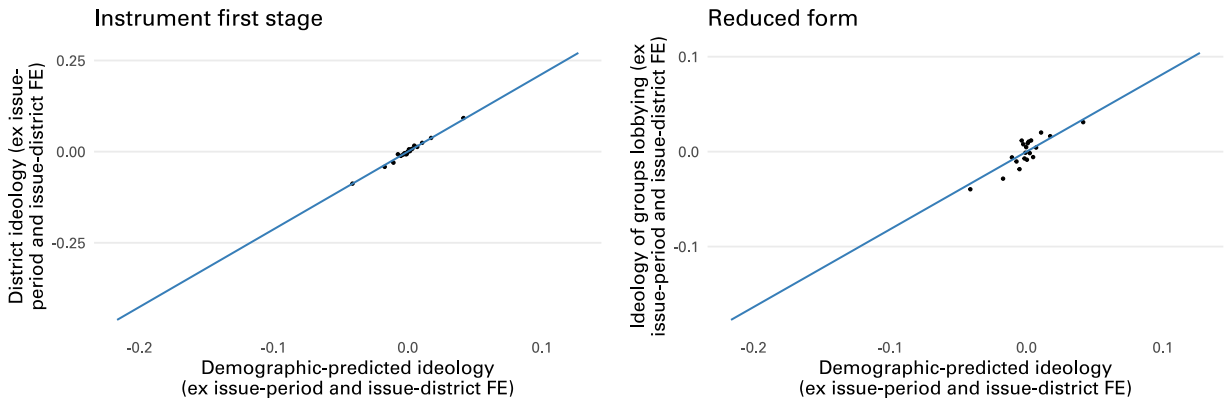


Figure A.7: first stage and reduced form for instrumental variables estimation

The left panel plots the relationship between observed district ideology and district ideology predicted from demographic composition, after residualizing out issue-period and issue-district fixed effects, as in Table 2 model (4). The relationship between the instrument and independent variable is positive and monotonic. The right panel plots the relationship between the ideology of groups lobbying a legislator and district ideology predicted from demographics. It shows that demographic-driven shifts in district ideology are associated with corresponding shifts in the ideology of interest groups lobbying that legislator. Both panels present binned scatterplots with OLS fits.

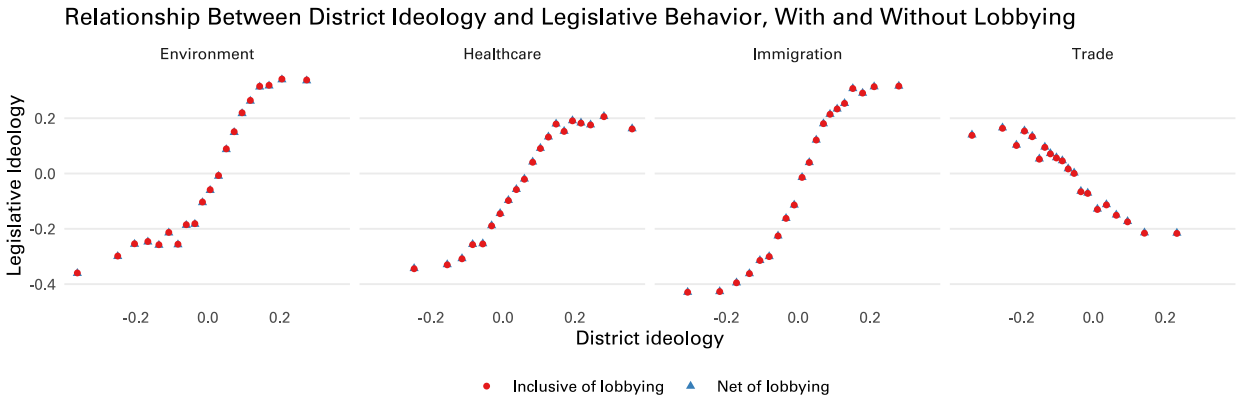


Figure A.8: District ideology and legislator preferences, with and without lobbying

Each figure shows the binned scatterplot of the relationship between district ideology and legislator ideology. Constituency ideology is estimated by running a factor model on CES survey data. Legislator ideology net of lobbying (blue triangle) is the legislator's factor loading estimated by running an interactive fixed effects model with bill fixed effects, legislator-by-bill interactive fixed effects, and covariates for lobbying for and against the bill; it gives the legislator's ideology controlling for the offsetting effects of lobbying ($\lambda_i$). Legislator ideology inclusive of lobbying is that model's predicted ideal point for a legislator who voted the same way but was not lobbied ($R_i$); it gives the prediction from a naive model that does not take into account lobbying.

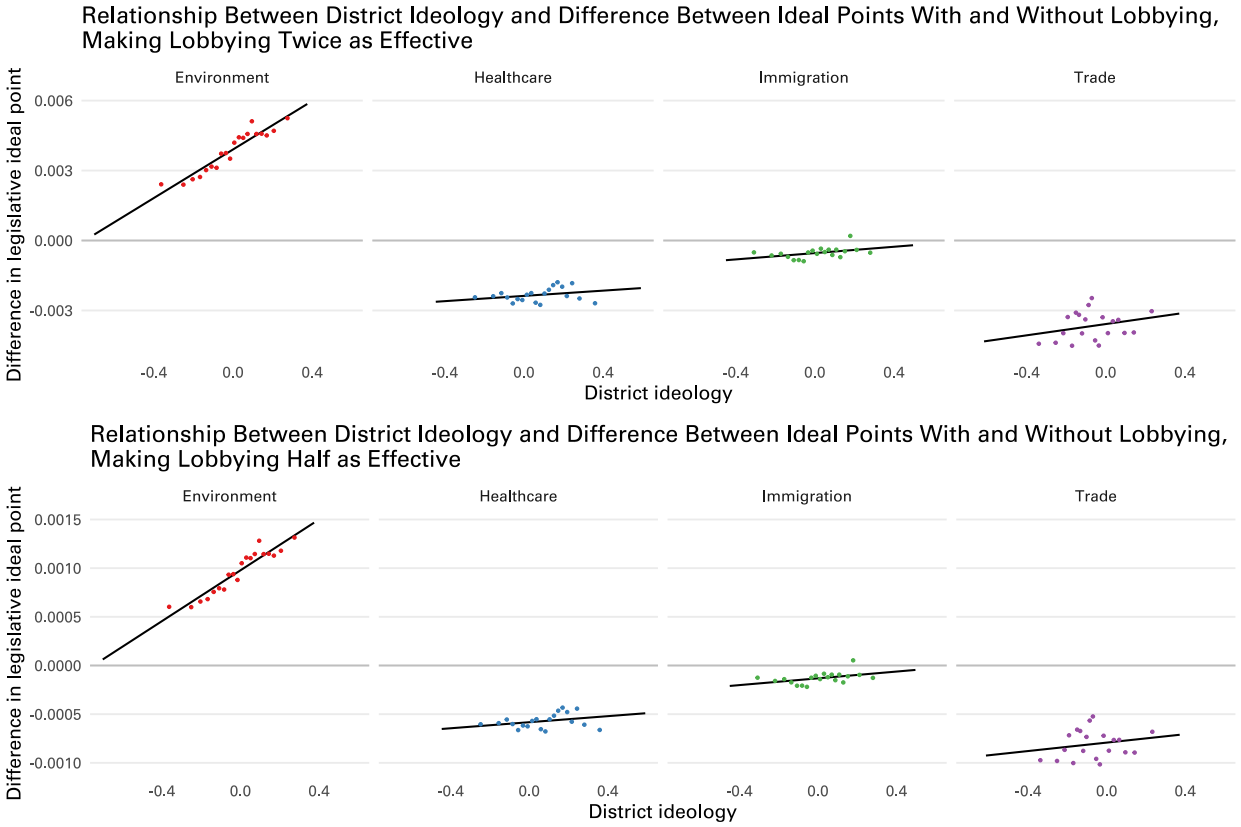


Figure A.9: District ideology and difference in legislator ideal point due to lobbying, fixing the effectiveness of lobbying

These figures reproduce Figure 4, varying the magnitude of lobbying's effects on legislative voting. Each figure shows the binned scatterplot of the relationship between district ideology and the difference in legislator ideology attributable to lobbying. The x axis is district ideology measured by running a factor model on CES data. The y axis is the legislator's ideology inclusive of lobbying, minus their ideology net of lobbying. As in Figure 4, in both sets of panels, the measures of ideology are estimated by running an interactive fixed effects model on roll-calls, adjusting for lobbying by groups supportive or opposed to the bill. Where these figures differ is in fixing the effectiveness of lobbying at twice (top) or half (bottom) the coefficients estimated in Table 3.

# B IDEAL POINT ESTIMATION PARAMETERS

## B.1 *Survey questions*

Table B.1: CES survey questions used to estimate environment ideal points, and discrimination parameters

| Issue | Years asked | Respondents | $\beta$ |
|---|---|---|---|
| Oppose strengthening of enforcement of Clean Air and Water Acts | 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023 | 392,894 | 3.01 |
| Oppose EPA regulating carbon dioxide emissions | 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023 | 392,783 | 2.54 |
| Immediate action on climate is not necessary | 2006, 2007, 2009, 2010, 2011, 2012, 2022 | 225,781 | 2.50 |
| Jobs are more important than environmental protection | 2006, 2007, 2008, 2010, 2012, 2013 | 145,615 | 2.35 |
| Oppose requiring states to use a minimum amount of renewable fuels | 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023 | 392,988 | 2.27 |
| Oppose US membership of Paris Agreement | 2017, 2018, 2019, 2020, 2021, 2022 | 241,504 | 2.13 |
| Oppose carbon cap and trade (American Clean Energy and Security Act) | 2010 | 51,241 | 1.46 |
| Oppose requiring clean energy in federal agencies | 2022 | 59,800 | 1.42 |
| Support repeal of clean power plant rules | 2018, 2019, 2020 | 129,999 | 1.19 |
| Oppose halting new oil and gas leases on federal lands | 2023 | 24,500 | 0.97 |
| Oppose raising average fuel efficiency | 2014, 2015, 2016, 2017, 2018, 2020, 2021, 2022 | 350,406 | 0.96 |
| Oppose carbon tax | 2008 | 22,372 | 0.94 |
| Support increasing US fossil fuel production | 2022, 2023 | 84,492 | 0.90 |

*Note:*
This table shows the CES questions used to estimate environment ideal points. $\beta$ is the estimated discrimination parameter for the question, more positive values indicate that affirmative answers to the question are associated with more positive latent ideology.

Table B.2: CES survey questions used to estimate healthcare ideal points, and discrimination parameters

| Issue | Years asked | Respondents | $\beta$ |
|---|---|---|---|
| Oppose Affordable Care Act | 2010, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023 | 521,066 | 4.37 |
| Oppose expanding Medicare for all Americans | 2018, 2019, 2020, 2021, 2022 | 224,353 | 1.65 |
| Oppose renewing and expanding State Children's Health Insurance Program | 2010 | 51,784 | 1.47 |
| State should refuse to implement the expansion of health care for poor people, even if it costs the state federal Medicaid funds | 2014 | 55,473 | 1.45 |
| Support American Healthcare Act | 2017 | 18,037 | 1.09 |
| Oppose ACA mandate | 2018, 2019, 2020, 2021 | 164,332 | 1.07 |
| Oppose lowering Medicare eligibility age | 2019, 2020 | 78,742 | 1.01 |
| Oppose expanding Medicaid coverage | 2021, 2023 | 50,196 | 0.99 |
| Support repealing ACA mandate, and cutting Medicaid payments and reducing taxes on expensive health plans | 2018 | 59,903 | 0.96 |
| Support restricting Medicaid coverage to those employed | 2021, 2023 | 50,197 | 0.80 |

*Note:*
This table shows the CES questions used to estimate healthcare ideal points. $\beta$ is the estimated discrimination parameter for the question, more positive values indicate that affirmative answers to the question are associated with more positive latent ideology.

Table B.3: CES survey questions used to estimate healthcare including abortion ideal points, and discrimination parameters

| Issue | Years asked | Respondents | $\beta$ |
|---|---|---|---|
| Oppose abortion always being allowed as a matter of choice | 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023 | 636,626 | 3.63 |
| Support prohibiting the use of federal funds for abortions | 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2022 | 351,112 | 2.83 |
| Support allowing employers to decline coverage of abortion in insurance plans | 2014, 2015, 2016, 2017, 2018, 2020, 2022 | 333,352 | 2.67 |
| Oppose Affordable Care Act | 2010, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023 | 521,066 | 1.51 |

| | | | |
|---|---|---|---|
| Support banning abortion after 20 weeks | 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022 | 376,728 | 1.42 |
| Oppose expanding Medicare for all Americans | 2018, 2019, 2020, 2021, 2022 | 224,353 | 1.37 |
| Oppose expanding access to abortion | 2023 | 24,488 | 1.06 |
| Support abortion being illegal in all circumstances | 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023 | 580,922 | 1.04 |
| Oppose renewing and expanding State Children's Health Insurance Program | 2010 | 51,784 | 1.00 |
| State should refuse to implement the expansion of health care for poor people, even if it costs the state federal Medicaid funds | 2014 | 55,473 | 0.95 |
| Support allowing abortion only in cases of rape, incest, or when the woman's life is in danger | 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023 | 401,107 | 0.93 |
| Oppose government guaranteeing health insurance for all US citizens | 2008 | 26,935 | 0.83 |
| Oppose lowering Medicare eligibility age | 2019, 2020 | 78,742 | 0.82 |
| Oppose expanding Medicaid coverage | 2021, 2023 | 50,196 | 0.78 |
| Support American Healthcare Act | 2017 | 18,037 | 0.73 |
| Oppose ACA mandate | 2018, 2019, 2020, 2021 | 164,332 | 0.65 |
| Oppose prohibiting government restrictions on abortion access | 2023 | 24,321 | 0.63 |
| Support repealing ACA mandate, and cutting Medicaid payments and reducing taxes on expensive health plans | 2018 | 59,903 | 0.61 |
| Support restricting Medicaid coverage to those employed | 2021, 2023 | 50,197 | 0.53 |
| Oppose setting up public insurance entity | 2009 | 11,325 | 0.48 |
| Oppose requiring everyone to buy health insurance | 2009 | 10,705 | 0.44 |
| Oppose prohibiting states from requiring that abortions be performed only at hospitals | 2020, 2021 | 86,671 | 0.36 |
| Oppose requiring businesses to provide health insurance | 2009 | 11,189 | 0.23 |

*Note:*

This table shows the CES questions used to estimate healthcare including abortion ideal points.

Table B.4: CES survey questions used to estimate immigration ideal points, and discrimination parameters

| Issue | Years asked | Respondents | $\beta$ |
|---|---|---|---|
| Support building wall between US and Mexico | 2007, 2017, 2018, 2020, 2021, 2022, 2023 | 258,997 | 3.45 |
| Support increasing patrols on US-Mexico border | 2007, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2019, 2020, 2021, 2022, 2023 | 498,720 | 2.51 |
| Support identifying and deporting illegal immigrants | 2014, 2015, 2016, 2017 | 153,250 | 2.38 |
| Support allowing police to question suspected illegal immigrants | 2010, 2011, 2012, 2013, 2014, 2015, 2017 | 235,134 | 2.29 |
| Support withholding federal funding from police failing to report illegal immigrants | 2017, 2018, 2019, 2020, 2021 | 182,698 | 2.22 |
| Support reducing the number of legal immigrants | 2018, 2019, 2020, 2022 | 197,399 | 1.90 |
| Oppose path to citizenship for illegal immigrants (2006 Senate reform) | 2006, 2007 | 42,235 | 1.80 |
| Support sending to prison any person who has been deported and reenters the US | 2018 | 59,929 | 1.39 |
| Oppose granting legal status to illegal immigrants | 2007, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2019, 2020, 2021, 2022, 2023 | 498,747 | 1.37 |
| Support fining businesses that hire illegal immigrants | 2007, 2010, 2012, 2013, 2014, 2015, 2016, 2017 | 185,116 | 1.33 |
| Support denying automatic citizenship to American-born children of illegal immigrants | 2012 | 54,535 | 1.28 |
| Support prohibiting illegal immigrants from using emergency hospital care and public schools | 2012, 2013 | 70,935 | 1.22 |
| Oppose legal status for children of immigrants (DACA) | 2016, 2018, 2019, 2020, 2021, 2023 | 253,559 | 1.19 |
| Support increasing deportations | 2017 | 18,176 | 1.03 |
| Oppose increasing the number of visas for overseas workers | 2015, 2016, 2017 | 45,719 | 0.61 |
| Support increasing criminal penalties for individuals in the country illegally who are convicted of certain crimes, deported, and then re-enter the US illegally (Kate's Law) | 2017 | 18,059 | 0.41 |
| Oppose increasing the number of guest workers | 2007 | 9,999 | 0.17 |

*Note:*
This table shows the CES questions used to estimate immigration ideal points. $\beta$ is the estimated discrimination parameter for the question, more positive values indicate that affirmative answers to the question are associated with more positive latent ideology.

Table B.5: CES survey questions used to estimate trade ideal points, and discrimination parameters

| Issue | Years asked | Respondents | $\beta$ |
|---|---|---|---|
| Oppose tariffs on imports from China | 2018, 2019, 2020, 2021 | 163,690 | 4.56 |
| Oppose increasing tariffs on European aircraft and agricultural products | 2020 | 60,053 | 2.66 |
| Support US membership of Trans-Pacific Partnership | 2015, 2016, 2018, 2019, 2020, 2021 | 242,016 | 1.90 |
| Oppose tariffs on steel and aluminum, including from Canada and Mexico | 2018, 2019, 2020, 2021 | 163,460 | 1.85 |
| Oppose tariffs on steel and aluminum, except from Canada and Mexico | 2018, 2019, 2020 | 137,920 | 1.28 |

*Note:*
This table shows the CES questions used to estimate trade ideal points. $\beta$ is the estimated discrimination parameter for the question, more positive values indicate that affirmative answers to the question are associated with more positive latent ideology.

B.2 *Ideal points of most extreme interest groups*

Table B.6: Interest groups with most extreme environment ideal points, groups taking at least 5 positions

| Most Republican | | Least Republican | |
|---|---|---|---|
| Interest Group | IRT | Interest Group | IRT |
| American Petroleum Institute | 1.93 | Sierra Club | -2.82 |
| American Energy Alliance | 1.87 | League of Conservation Voters | -2.23 |
| National Mining Association | 1.81 | Clean Water Action | -1.99 |
| Americans for Prosperity | 1.80 | Earthjustice | -1.95 |
| Independent Petroleum Association of America | 1.74 | Environment America | -1.94 |
| Americans for Tax Reform | 1.71 | Environmental Working Group | -1.82 |
| National Association of Counties | 1.69 | Natural Resources Defense Council | -1.79 |
| American Conservative Union Strikeforce | 1.67 | U.S. PIRG | -1.74 |
| Council for Citizens Against Government Waste | 1.63 | EarthWorks | -1.69 |
| Western Energy Alliance | 1.56 | Physicians for Social Responsibility | -1.66 |
| Small Business & Entrepreneurship Council | 1.53 | Trout Unlimited | -1.59 |
| National Cattlemen's Beef Association | 1.51 | U.S. Climate Action Network | -1.56 |
| American Commitment | 1.47 | Asbestos Disease Awareness Organization | -1.54 |
| National Petrochemical and Refiners Association | 1.45 | Defenders of Wildlife | -1.53 |
| Petroleum Marketers Association of America | 1.43 | Breast Cancer Prevention Partners (BCPP) | -1.53 |
| Less Government | 1.40 | Wilderness Society | -1.52 |
| Competitive Enterprise Institute | 1.39 | American Rivers | -1.52 |
| American Fuel & Petrochemical Manufacturers | 1.33 | Riverkeeper | -1.50 |
| National Taxpayers Union | 1.33 | Environmental Integrity Project | -1.49 |
| Club for Growth | 1.28 | American Lung Association | -1.48 |

Table B.7: Interest groups with most extreme healthcare ideal points, groups taking at least 5 positions

| Most Republican | | Least Republican | |
|---|---|---|---|
| Interest Group | IRT | Interest Group | IRT |
| Americans for Tax Reform | 2.67 | NARAL Pro-Choice America | -1.64 |
| National Right to Life Committee | 2.36 | American Federation of State, County and Municipal Employees | -1.61 |
| National Taxpayers Union | 2.33 | AARP | -1.57 |
| National Breast Cancer Coalition | 2.18 | Planned Parenthood | -1.55 |
| Association of American Physicians and Surgeons | 2.12 | National Consumers League | -1.51 |
| cigar rights of america | 1.86 | U.S. PIRG | -1.49 |
| International Premium Cigar & Pipe Retailers Association | 1.86 | American Academy of Pediatrics | -1.49 |
| American Benefits Council | 1.83 | American Nurses Association | -1.45 |
| Independent Insurance Agents & Brokers of America | 1.82 | National Women's Law Center | -1.44 |
| Americans for Prosperity | 1.82 | American Heart Association | -1.42 |
| Family Research Council | 1.81 | Health Care for America Now | -1.42 |
| Consumer Brands Association | 1.76 | American Occupational Therapy Association | -1.41 |
| International Franchise Association | 1.75 | Mothers Against Medical Error | -1.41 |
| National Association of Insurance and Financial Advisors | 1.67 | Small Business Majority | -1.40 |
| Competitive Enterprise Institute | 1.66 | National Women's Health Network | -1.39 |
| Concerned Women for America | 1.65 | National Council of Jewish Women | -1.38 |
| Retail Industry Leaders Association | 1.65 | AFL-CIO | -1.38 |
| HR Policy Association | 1.63 | National Committee to Preserve Social Security and Medicare | -1.37 |
| FreedomWorks | 1.58 | National Organization for Women | -1.36 |
| national committee for a human life amendment | 1.58 | American Public Health Association | -1.35 |

Table B.8: Interest groups with most extreme immigration ideal points, groups taking at least 5 positions

| Most Republican | | Least Republican | |
|---|---|---|---|
| Interest Group | IRT | Interest Group | IRT |
| Americans for Legal Immigration | 2.31 | AFL-CIO | -2.63 |
| Act for America | 2.12 | Leadership Conference on Civil and Human Rights | -2.48 |
| Californians for Population Stabilization | 1.98 | Friends Committee on National Legislation | -2.43 |
| progressives for immigration reform | 1.84 | American Federation of State, County and Municipal Employees | -2.31 |
| FreedomWorks | 1.80 | National Latina Institute for Reproductive Health | -2.30 |
| American Hospital Association | 1.67 | OCA - Asian Pacific American Advocates | -2.30 |
| Heritage Foundation | 1.43 | International Rescue Committee | -2.30 |
| Center for Immigration Studies | 1.26 | South Asian Americans Leading Together | -2.29 |
| National Association of Police Organizations | 0.98 | National Korean American Service & Education Consortium | -2.29 |
| National Restaurant Association | 0.96 | Asian Americans Advancing Justice | -2.29 |
| Federation for American Immigration Reform | 0.80 | We Belong Together | -2.28 |
| National Federation of Independent Business | 0.74 | United We Dream | -2.28 |
| Heritage Action for America | 0.62 | Immigrant Legal Resource Center | -2.28 |
| Society for Human Resource Management | 0.57 | National People's Action | -2.28 |
| NumbersUSA | 0.52 | OneAmerica | -2.28 |
| American Council on International Personnel | 0.50 | Asian Law Alliance | -2.28 |
| Real Estate Roundtable | 0.42 | American-Arab Anti-Discrimination Committee | -2.28 |
| North American Meat Institute | 0.41 | Alliance for Citizenship | -2.28 |
| National Association of Home Builders | 0.39 | Just Foreign Policy | -2.28 |
| American Farm Bureau Federation | 0.39 | Immigration Equality Action Fund | -2.28 |

Table B.9: Interest groups with most extreme trade ideal points, groups taking at least 5 positions

| Most Republican | | Least Republican | |
|---|---|---|---|
| Interest Group | IRT | Interest Group | IRT |
| Club for Growth | 2.34 | International Association of Machinists and Aerospace Workers | -2.97 |
| FreedomWorks | 2.02 | International Federation of Professional & Technical Engineers | -2.52 |
| Americans for Prosperity | 1.47 | American Postal Workers Union | -1.86 |
| Heritage Foundation | 1.43 | American Iron and Steel Institute | -1.86 |
| American Soybean Association | 1.36 | Sierra Club | -1.82 |
| United Parcel Service (UPS) | 1.35 | United Steelworkers | -1.80 |
| Information Technology Industry Council | 1.33 | AFL-CIO | -1.70 |
| Americans for Tax Reform | 1.33 | International Brotherhood of Teamsters | -1.63 |
| USA Poultry and Egg Export Council | 1.33 | Public Citizen | -1.59 |
| Taxpayers Protection Alliance | 1.31 | International Brotherhood of Electrical Workers | -1.59 |
| International Dairy Foods Association | 1.30 | Presbyterian Church (U.S.A.) | -1.51 |
| National Fisheries Institute | 1.28 | U.S. Business & Industry Council | -1.51 |
| Pacific Coast Council of Customs Brokers & Freight Forwarders | 1.28 | Communications Workers of America | -1.50 |
| Securities Industry and Financial Markets Association | 1.28 | American Federation of State, County and Municipal Employees | -1.50 |
| North American Meat Institute | 1.27 | UNITE HERE | -1.44 |
| American Chemistry Council | 1.26 | Progressive Democrats of America | -1.44 |
| National Cattlemen's Beef Association | 1.26 | Coalition for a Prosperous America | -1.35 |
| National Council of Farmer Cooperatives | 1.25 | Service Employees International Union | -1.35 |
| Johnson & Johnson | 1.24 | Electronic Frontier Foundation | -1.35 |
| Distilled Spirits Council of the United States | 1.24 | Food And Water Watcg | -1.35 |

## B.3 *Parameters of bills*

Table B.10: Parameters of bills used to estimate legislator and interest group environment ideal points, 10 least and most Republican

| Code | Bill | $\alpha$ | $\beta$ |
|---|---|---|---|
| hr9-116 | Climate Action Now Act | -0.95 | -10.42 |
| sjres14-117 | A joint resolution providing for congressional disapproval under chapter 8 of title 5, United States Code, of the rule submitted by the Environmental Protection Agency relating to Oil and Natural Gas Sector: Emission Standards for New, Reconstructed, and Modified Sources Review. | -0.55 | -10.07 |
| hr3585-111 | Solar Technology Roadmap Act | 1.27 | -8.6 |
| hr2467-117 | PFAS Action Act of 2021 | -0.1 | -8.58 |
| s940-112 | Close Big Oil Tax Loopholes Act | -1.29 | -8.48 |
| hr4715-111 | Clean Estuaries Act of 2010 | 0.53 | -8.44 |
| hr720-110 | Water Quality Financing Act of 2007 | 1.14 | -8.22 |
| hr535-116 | PFAS Action Act of 2019 | 0.14 | -8.19 |
| hr1262-111 | Water Quality Investment Act of 2009 | 1.29 | -8.04 |
| hr3029-111 | A bill to establish a research, development, and technology demonstration program to improve the efficiency of gas turbines used in combined cycle and simple cycle power generation systems. | 0.7 | -8.01 |
| ⋮ | ⋮ | ⋮ | ⋮ |
| hr1582-113 | Energy Consumers Relief Act of 2013 | 2.01 | 10.45 |
| hr806-115 | Ozone Standards Implementation Act of 2017 | 1.13 | 10.48 |
| hr1430-115 | Honest and Open New EPA Science Treatment Act of | 1.26 | 10.57 |
| hjres36-115 | Providing for congressional disapproval under chapter 8 of title 5, United States Code, of the final rule of the Bureau of Land Management relating to Waste Prevention, Production Subject to Royalties, and Resource Conservation. | 0.85 | 10.58 |
| hr1422-113 | EPA Science Advisory Board Reform Act of 2014 | 1.49 | 10.65 |
| hr910-112 | Energy Tax Prevention Act of 2011 | 2.42 | 10.71 |
| hr3893-109 | Gasoline for America's Security Act of 2005 | 1.03 | 10.91 |
| sjres23-114 | A joint resolution providing for congressional disapproval under chapter 8 of title 5, United States Code, of a rule submitted by the Environmental Protection Agency relating to Standards of Performance for Greenhouse Gas Emissions from New, Modified, and Reconstructed Stationary Sources: Electric Utility Generating Units. | 1.25 | 11.14 |

| | | | |
|---|---|---|---|
| hr1030-114 | Secret Science Reform Act of 2015 | 1.83 | 11.26 |
| sjres24-114 | A joint resolution providing for congressional disapproval under chapter 8 of title 5, United States Code, of a rule submitted by the Environmental Protection Agency relating to Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units. | 1.77 | 11.61 |
| hr4480-112 | Domestic Energy and Jobs Act | 1.88 | 12.46 |

Table B.11: Parameters of bills used to estimate legislator and interest group healthcare ideal points, 10 least and most Republican

| Code | Bill | $\alpha$ | $\beta$ |
|---|---|---|---|
| hr2-111 | Children's Health Insurance Program Reauthorization Act of 2009 | 3.74 | -11.99 |
| hr3963-110 | Children's Health Insurance Program Reauthorization Act of 2007 | 3.5 | -11.41 |
| hr3-116 | Elijah E. Cummings Lower Drug Costs Now Act | 1.56 | -10.6 |
| s610-117 | Protecting Medicare and American Farmers from Sequester Cuts Act | 2.28 | -10.45 |
| hr987-116 | Strengthening Health Care and Lowering Prescription Drug Costs Act | 1.99 | -10.44 |
| hr3755-117 | Women's Health Protection Act of 2021 | 1.15 | -10.36 |
| hr8296-117 | Women's Health Protection Act of 2022 | 1.17 | -10.31 |
| hr1425-116 | Patient Protection and Affordable Care Enhancement Act | 1.67 | -10.25 |
| hr8542-117 | Mental Health Justice Act of 2022 | 1.56 | -10.04 |
| hr8297-117 | Ensuring Access to Abortion Act of 2022 | 1.57 | -10.02 |
| ⋮ | ⋮ | ⋮ | ⋮ |
| hr3-112 | No Taxpayer Funding for Abortion Act | -0.18 | 9.69 |
| hr1101-115 | Small Business Health Fairness Act of 2017 | -0.74 | 9.72 |
| hr7-113 | No Taxpayer Funding for Abortion and Abortion Insurance Full Disclosure Act of 2014 | -1.09 | 9.89 |
| hr596-114 | To repeal the Patient Protection and Affordable Care Act and health care-related provisions in the Health Care and Education Reconciliation Act of 2010, and for other purposes. | -1.39 | 9.97 |
| hr6079-112 | Repeal of Obamacare Act | -1.03 | 10.09 |
| hr45-113 | To repeal the Patient Protection and Affordable Care Act and health care-related provisions in the Health Care and Education Reconciliation Act of 2010. | -1.43 | 10.59 |

| | | | |
|---|---|---|---|
| hjres43-115 | Joint resolution providing for congressional disapproval under chapter 8 of title 5, United States Code, of the final rule submitted by Secretary of Health and Human Services relating to compliance with title X requirements by project recipients in selecting subrecipients | -1.52 | 10.96 |
| hr2-112 | Repealing the Job-Killing Health Care Law Act | -1.34 | 11.01 |
| hr3134-114 | Defund Planned Parenthood Act of 2015 | -1.59 | 11.22 |
| hr3762-114 | To provide for reconciliation pursuant to section 2002 of the concurrent resolution on the budget for fiscal year 2016. | -1.51 | 11.36 |
| hr1217-112 | To repeal the Prevention and Public Health Fund. | -1.42 | 11.45 |

Table B.12: Parameters of bills used to estimate legislator and interest group immigration ideal points, 10 least and most Republican

| Code | Bill | $\alpha$ | $\beta$ |
|---|---|---|---|
| hr6-116 | American Dream and Promise Act of 2019 | 2.69 | -14.71 |
| hr1573-117 | Access to Counsel Act of 2021 | 1.45 | -14.21 |
| hr2203-116 | Homeland Security Improvement Act | 1.49 | -14.08 |
| hr1333-117 | NO BAN Act | 1.55 | -14.03 |
| hr6-117 | American Dream and Promise Act of 2021 | 2.45 | -13.77 |
| hr7946-117 | Veteran Service Recognition Act of 2022 | 1.69 | -13.33 |
| hr3525-116 | U.S. Border Patrol Medical Screening Standards Act | 1.63 | -13.32 |
| hr3239-116 | Humanitarian Standards for Individuals in Customs and Border Protection Custody Act | 1.62 | -13.17 |
| hres489-116 | Condemning President Trump's racist comments directed at Members of Congress. | 1.96 | -13.03 |
| hr1603-117 | Farm Workforce Modernization Act of 2021 | 3.15 | -12.77 |
| ⋮ | ⋮ | ⋮ | ⋮ |
| hr418-109 | REAL ID Act of 2005 | -0.47 | 10.53 |
| hr2131-113 | SKILLS Visa Act | 0.67 | 10.71 |
| hr2164-112 | Legal Workforce Act | -2.45 | 11.22 |
| hr3009-114 | Enforce the Law for Sanctuary Cities Act | -1.06 | 11.46 |
| hr5272-113 | To prohibit certain actions with respect to deferred action for aliens not lawfully present in the United States, and for other purposes. | -1.84 | 12.23 |
| hr6095-109 | Immigration Law Enforcement Act of 2006 | 0.43 | 12.46 |
| hr3004-115 | Kate's Law | -0.04 | 13.13 |
| hr5759-113 | Preventing Executive Overreach on Immigration Act of 2014 | -1.77 | 13.31 |
| hr3003-115 | No Sanctuary for Criminals Act | -1.52 | 13.4 |
| hr3697-115 | Criminal Alien Gang Member Removal Act | -0.66 | 14.16 |

| | | | |
|---|---|---|---|
| hr4760-115 | Securing America's Future Act of 2018 | -4.43 | 16.69 |

Table B.13: Parameters of bills used to estimate legislator and interest group trade ideal points, 10 least and most Republican

| Code | Bill | $\alpha$ | $\beta$ |
|---|---|---|---|
| hr3920-110 | Trade and Globalization Assistance Act of 2007 | 1.59 | -17.05 |
| hr4863-116 | United States Export Finance Agency Act of 2019 | 1.23 | -15.97 |
| s1619-112 | Currency Exchange Rate Oversight Reform Act of 2011 | 1.35 | -10.7 |
| hr597-114 | Export-Import Bank Reform and Reauthorization Act of 2015 | 2.31 | -10.59 |
| hr2378-111 | Currency Reform for Fair Trade Act | 2.08 | -10.57 |
| hr639-112 | Currency Reform for Fair Trade Act | 0.64 | -10.44 |
| s328-112 | Currency Reform for Fair Trade Act | 0.64 | -10.44 |
| hr4476-117 | DHS Trade and Economic Security Council Act of 2021 | 2.96 | -10.19 |
| hr4105-112 | To apply the countervailing duty provisions of the Tariff Act of 1930 to nonmarket economy countries, and for other purposes. | 3.48 | -9.86 |
| hres1168-117 | Reaffirming the economic partnership between the United States and the Caribbean nations and recognizing the need to strengthen trade and investment between the United States and the Caribbean nations, our Third Border. | 3.02 | -9.25 |
| ⋮ | ⋮ | ⋮ | ⋮ |
| s1307-109 | Dominican Republic-Central America-United States Free Trade Agreement Implementation Act | -0.81 | 9.97 |
| s1641-112 | United States-Colombia Trade Promotion Agreement Implementation Act | -0.99 | 10.33 |
| hr2146-114 | Defending Public Safety Employees' Retirement Act | 0.12 | 10.39 |
| s3569-109 | United States-Oman Free Trade Agreement Implementation Act | -0.34 | 10.89 |
| s1900-113 | Bipartisan Congressional Trade Priorities Act of 2014 | -0.18 | 11.89 |
| hr3045-109 | Dominican Republic-Central America-United States Free Trade Agreement Implementation Act | -0.66 | 13.75 |
| hr1890-114 | Bipartisan Congressional Trade Priorities and Accountability Act of 2015 | -0.6 | 14.26 |
| hr3079-112 | United States-Panama Trade Promotion Agreement Implementation Act | 1.56 | 14.62 |
| s995-114 | Bipartisan Congressional Trade Priorities and Accountability Act of 2015 | -0.7 | 15.51 |
| hr3078-112 | United States-Colombia Trade Promotion Agreement Implementation Act | 0.34 | 17.45 |

| | | | |
|---|---|---|---|
| hr5684-109 | United States-Oman Free Trade Agreement Implementation Act | -0.66 | 19.4 |

## C ADDITIONAL DETAIL ON LEGISLATORS' TRADE PREFERENCES

One striking feature of the ideal point estimates is that voters' ideal points for trade—rotated so that higher values are more pro-trade—are negatively correlated with their representatives' trade ideal points. In this appendix we investigate why this is the case.

Note that the rotation of both sets of ideal points is broadly correct: higher legislative ideal points are associated with more pro-trade stances. We verify the rotation two ways. First, we examine voting on Trade Promotion Authority for the Trans Pacific Partnership in the 114th congress. The CES asks voters about support for the TPP, which is one of the questions used to estimate trade ideal points. Figure C.1 plots the Senate's roll-calls against senators' trade ideal points and voter support for TPP, and shows a strong positive relationship with the senators' ideal points, but not with voters' preferences. Voter support for TPP in this congress does correlate with voter support for trade more broadly. Figure C.2 plots state-level voters' trade ideal points against voter support for TPP in the 114th congress and shows a strong and positive correlation over time.

Second, we examine the relationship between legislators' trade ideal points and ratings by Public Citizen/Global Trade Watch. Public Citizen/Global Trade Watch is a pressure group that in its own words "has led the fight against corporate-rigged 'trade' agreements that provide special powers for Big Pharma to raise medicine prices, promote the outsourcing of jobs to low-wage countries and undermine the food safety and other safeguards on which our families rely."[15] We would therefore expect the legislators rated as sharing Public Citizen's preferences on trade to be more protectionist. Figure C.3 plots Public Citizen's trade ratings against the two measures of trade ideal points used in this paper. Both ideal point measures are negatively correlated with Public Citizen's scores, suggesting we are correct to infer higher ideal points as corresponding to more free-trade positions. The valence of the bills given large and positive discrimination parameters, such as the US Colombia Trade Promotion Agreement and US-Oman Free Trade Agreement, further supports this interpretation (Table B.13).

While the rotation of the ideal points is on average correct, their interpretation is complicated by the positions of the parties changing on trade during the period we study. As an alternative measure of pro-trade roll-calls, we use Maplight data on the public positions of the US Chamber of Commerce. The Chamber of Commerce is widely considered to be supportive of free trade (Kim and Osgood, 2019). If a legislator votes on trade bills in the direction supported by the Chamber of Commerce, they can reasonably be assumed to be voting on the free trade direction. We calculate these scores at the legislator-congress level. Figure C.4 plots these scores against the legislators' trade ideal points, over time. In the 109th-112th congress, higher ideal points are associated with an increased probability of voting with the Chamber of Commerce. From the 113th congress onwards, the two are negatively correlated. Despite this shift in partisan orientation towards trade, throughout the period, voter preferences are postively correlated with legislators voting in line with the

[15] `https://www.citizen.org/article/about-public-citizens-global-trade-watch/`

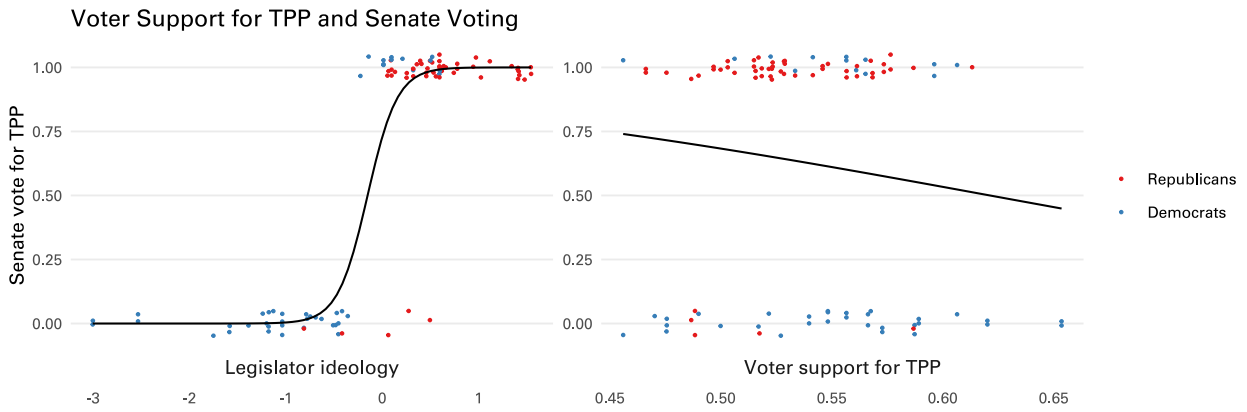


Figure C.1: Senate voting on TPP correlates strongly with legislator ideology, but not with voter support for TPP

This figure plots how a senator voted on HR-2146, which granted Trade Promotion Authority for the Trans Pacific Partnership, in the 114th congress, against the legislator's issue-specific ideology and voter support for TPP in the CES. Each dot corresponds to a senator, points are jittered to increase legibility. Black lines are logit fits.

Chamber of Commerce, though given the sparseness of the data some of these relationships are noisy. Figure C.5 plots the rate of legislators voting with the Chamber of Commerce on trade in each session of congress against the raw percentage of voters giving the pro-trade answer to CES survey questions in that session of congress (we use this measure rather than our estimated voter ideal points because it covers a longer period, with the caveat that the voter scores are not comparable over time).

The non-relationship between voters' and legislators' trade ideal points explains why, in Figure A.4, we find no relationship between the distance between interest groups and voters, and lobbying. In that figure, we calculate distance by first regressing legislator ideal points against voter ideal points, to place voter ideal points on the same scale as interest group and legislator ideal points. Because the two ideal point measures are negatively correlated, a negative relationship between this distance measure and lobbying would in fact indicate that on trade, interest groups lobby legislators with voters who have the opposite preferences. Figure C.7 shows that, in fact, interest groups tend to lobby legislators who are ideologically close to them. The left panel shows the null result from regressing legislator ideal points against voter ideal points, and then taking the difference between the interest group's ideal point and this fitted value. The middle panel uses the legislator's ideal points, and shows that interest groups do tend to lobby idealogically close legislators. The right panel places interest group and voter ideal points on a common scale by Z-scoring both, the assumption being that the means and variances of the two are the same, and then takes the difference between the Z-scored interest group and voter ideal points. This measure of distance is negatively correlated with lobbying, indicating—consistent with Figure 3—that pro-trade interest groups tend to lobby legislators with pro-trade constituents.

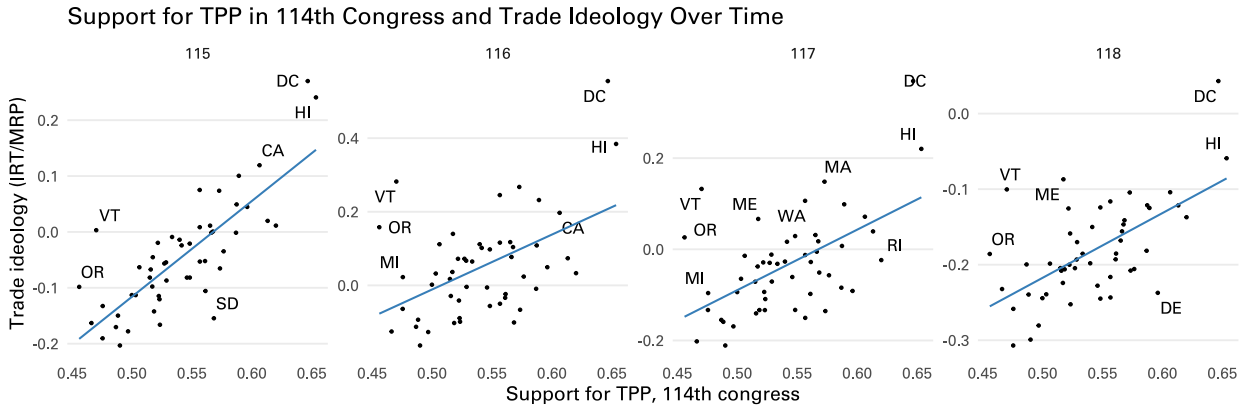


Figure C.2: Voter support for TPP in 114th congress correlates strongly with subsequent trade ideology

This figure plots average trade ideology among voters by state, estimated by fitting an IRT model to CES data and subsequently using multilevel regression and post-stratification to correct for nonrepresentativeness, in various congresses, against average support for the Trans Pacific Partnership among voters in the 114th congress.

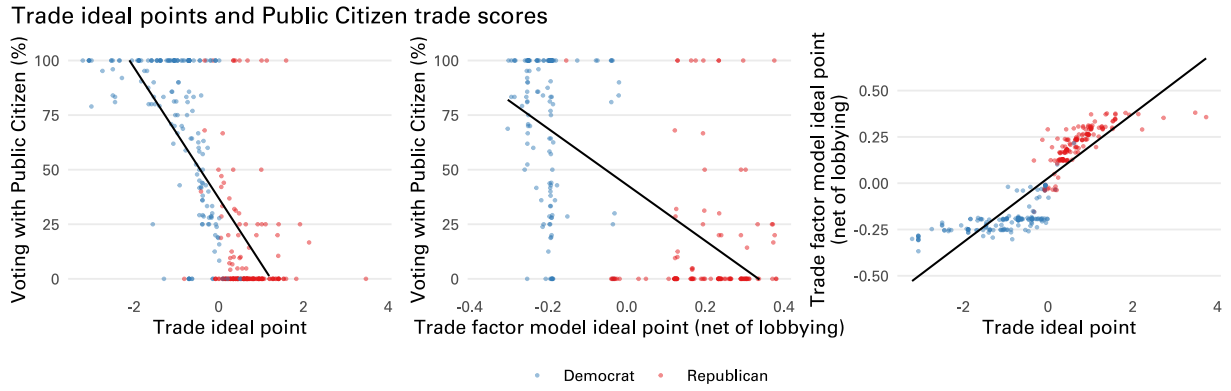


Figure C.3: Trade ideal points are negatively correlated with Public Citizen's "commitment to fair trade and the public interest" scores of legislators

The left panel plots Public Citizen/Global Trade Watch's measure of the percentage of the time that a legislator votes with their preferred position, against the estimated trade ideal point. The center panel plots Public Citizen's scores against the measures of legislative ideal points net of lobbying from a factor model. The right panel plots the two sets of trade ideal points against one another. Each dot is a legislator in the 116th congress. The black lines are OLS fitted values.

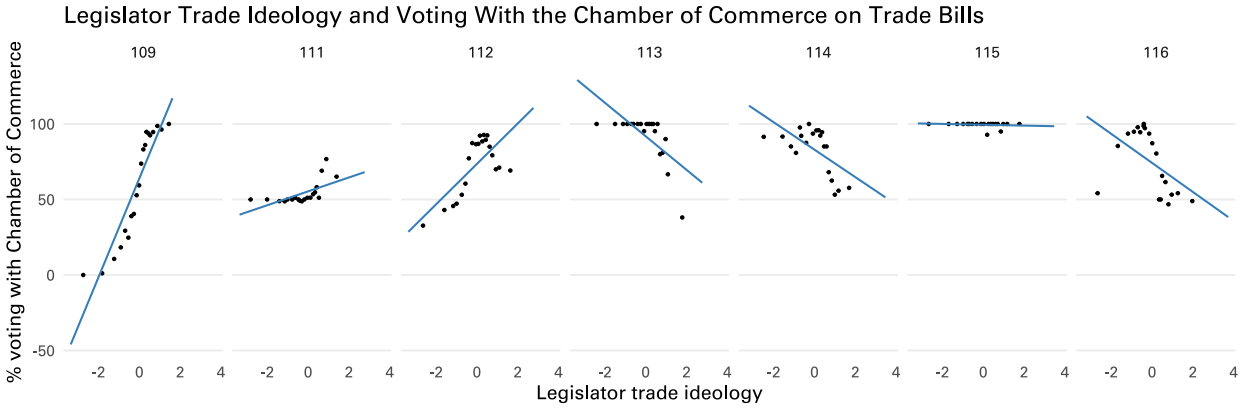


Figure C.4: The relationship between legislator ideal points on trade and voting with the Chamber of Commerce flips over time

Each panel plots the binned average percentage of legislators voting in the direction supported by the U.S. Chamber of Commerce on trade bills against the legislator's estimated ideal point on trade, in a different congress.

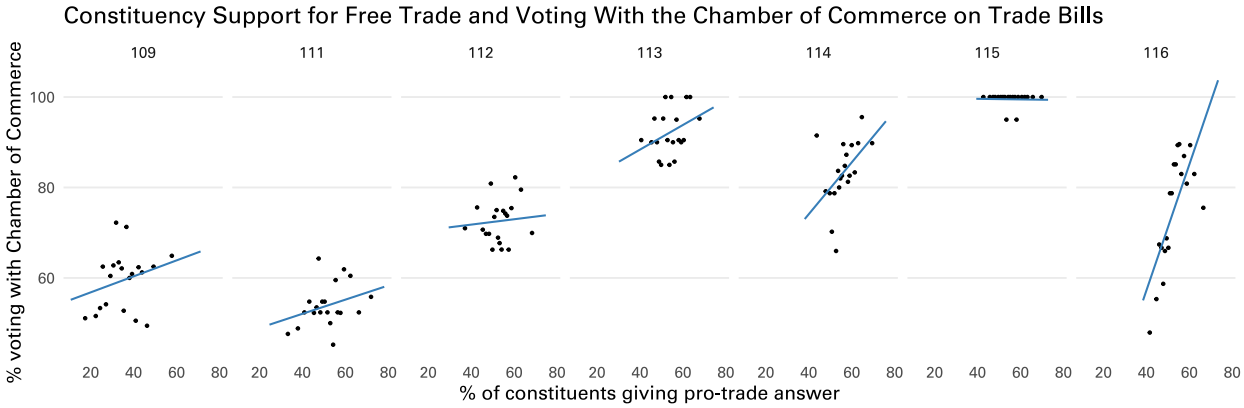


Figure C.5: District support for free trade consistently correlates with legislators voting with the Chamber of Commerce on trade bills, but the relationship strengthens in recent congresses

Each panel plots the binned average percentage of legislators voting in the direction supported by the U.S. Chamber of Commerce on trade bills against the raw share of survey respondents in the district giving the pro-free trade answer to survey questions about trade.

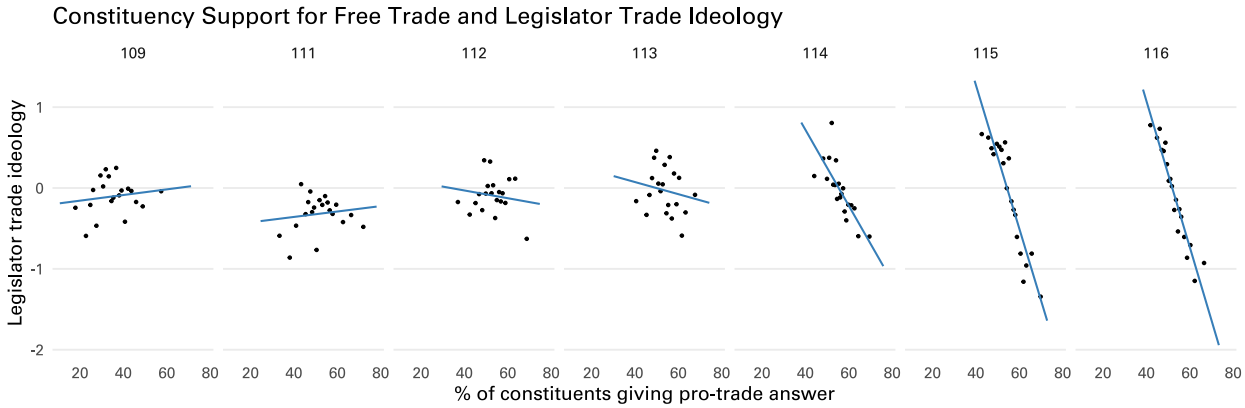


Figure C.6: The relationship between district support for free trade and legislator ideology on trade flips over time

Each panel plots the binned average of legislator trade ideal points against the raw share of survey respondents in the district giving the pro-free trade answer to survey questions about trade.

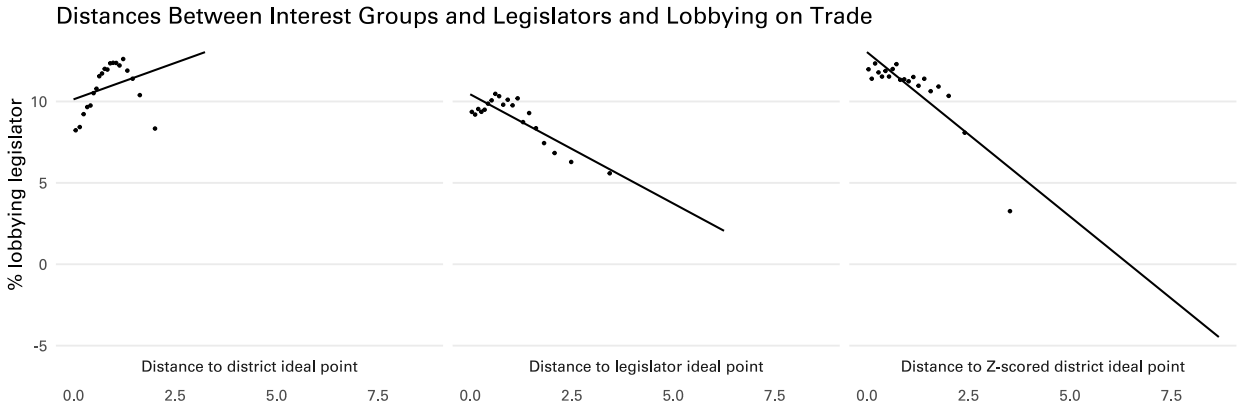


Figure C.7: Interest groups do lobby legislators on trade with aligned constituencies

Each panel plots the binned average percentage of interest groups lobbying a legislator on trade against a different measure of distance between the interest group and the legislator. In the left panel this measure is the difference between the interest group's trade ideal point, and the predicted value from regressing the legislators' trade ideal points against district trade ideal points. In the middle, the difference between the interest group and legislators' ideal points. In the right, the difference between the district ideal point and the interest group's ideal point, where both are Z-scored to (at the interest group or district level) have a mean of 0 and variance of 1. This figure shows that the apparent nonlinear relationship in the left panel is an artifact of the negative relationship between district and legislator ideology.

## D REPRESENTATIVENESS AND STRATEGIC DISCLOSURE IN THE MAPLIGHT DATA

The Maplight data provides information on a subset of interest groups. How concerned should we be about the representativeness of this data? Two specific concerns are, first, that the interest groups picked up by Maplight are unrepresentative of the pool of lobbying interest groups, and, second, that the public positions recorded by Maplight substitute for lobbying or are otherwise unrelated to lobbying.

On the first point, we can examine how, at the interest group-issue-congress level, groups for which we can estimate ideology from Maplight differ from those for which we cannot. Figure D.1 shows that groups in the Maplight data lobby more, on all issues. This form of unrepresentativeness is benign; we are more concerned about the lobbying behavior of groups that lobby more. Figures D.2 and D.3 show that groups in or not in the Maplight data follow similar distributions in terms of the ideologies of the districts of the legislators that they lobby. Table D.1 presents regression estimates of these relationships. Maplight groups lobby much more, but do not tend to lobby representatives of ideologically different districts, except on the environment, where they tend to be slightly more conservative. Maplight groups do not tend to lobby representatives of more or less extreme districts. At the legislator-issue level, lobbying by Maplight groups correlates extremely closely with lobbying by non-Maplight groups. In particular, Figure D.4 shows that for all issues, above a certain size, the relationship between log Maplight lobbying connections and log non-Maplight lobbying connections is essentially one-to-one.

Kim et al. (2025) use a graph neural network to infer the positions of interest groups on bills from lobbying patterns, after first using the texts of lobbying reports and Maplight data to estimate the positions of some groups on some bills. That project provides an alternative source of data on groups' positions. Because this paper's focus is on studying who groups lobby, it is inappropriate to use the Kim et al. (2025) data for our primary analyses for the groups' positions, given that data is also generated by voting patterns. That said, we can use this data to investigate the representativeness of the Maplight data. We estimate issue-specific ideal points using legislators, Maplight interest groups, and interest groups in the Kim et al. (2025) data. We treat groups appearing in the Maplight and Kim et al. (2025) datasets as separate entities. Figure D.5 plots the distributions ideology for these different groups. The distribution of ideology for interest groups that lobby in the Maplight data is similar to that for interest groups in the Kim et al. (2025) data.

Another concern is that groups take public positions strategically and that this strategic behavior complicates our analysis. If groups tended to take public stances to influence policy on one issue, and privately lobby on another, then our conclusions about the relationship between group preferences and lobbying would be incorrect. Table D.2 shows this is not the case. At the bill level, if a group takes a public stance on a bill, the probability that it lobbies on it is extremely close to 1. This suggests that public position taking and lobbying are complements, not substitutes.

We also use the Kim et al. (2025) data to investigate this concern. Figure D.6 plots group ideology estimated from Maplight against group ideology estimated from the Kim et al. (2025) data. The two are strongly positively correlated, with a slope close to 1. This positive relationship indicates that groups public positions are closely related to those inferred from

| | log contributions | | district ideology | | district extremism | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| In Maplight data | 0.583* | | 0.002 | | 0.000 | |
| | (0.059) | | (0.003) | | (0.001) | |
| × issue = Environment | | 0.417* | | 0.014* | | −0.002 |
| | | (0.095) | | (0.004) | | (0.002) |
| × issue = Healthcare | | 0.617* | | −0.004 | | 0.003 |
| | | (0.080) | | (0.004) | | (0.002) |
| × issue = Immigration | | 0.608* | | 0.010 | | −0.005 |
| | | (0.140) | | (0.007) | | (0.003) |
| × issue = Trade | | 0.727* | | −0.003 | | −0.001 |
| | | (0.136) | | (0.003) | | (0.002) |
| FE: Issue x congress | x | x | x | x | x | x |
| N | 28245 | 28245 | 28245 | 28245 | 28245 | 28245 |
| $R^2$ | 0.038 | 0.038 | 0.376 | 0.376 | 0.253 | 0.253 |

This table presents evidence of differences in lobbying behavior between interest groups linked to the Maplight data and those not linked. Data is at the interest group-congress-issue level. In models (1) and (2), the dependent variable is the log number of contributions to legislators by lobbyists hired to lobby by the interest group on the issue in the specific congress. In (3) and (4), it is the average district ideology of legislators lobbied by the interest groups, weighted by the number of contributions by lobbyists hired, in (5) and (6) the average absolute value of district ideology of legislators lobbied. The independent variable is whether the group is in the Maplight data, in even-numbered models, this is allowed to vary by issue. All models include issue-by-congress fixed effects. Standard errors clustered by interest group in parentheses. $^*p < 0.05$; $^\dagger p < 0.1$.

Table D.1: Differences between Maplight and non-Maplight interest groups

| | Lobbies on bill | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| Supports bill | 0.968* | 0.942* | 0.880* |
| | (0.006) | (0.014) | (0.012) |
| Opposes bill | 0.971* | 0.941* | 0.808* |
| | (0.005) | (0.009) | (0.027) |
| FE: Issue x congress | x | | |
| - Issue x congress x group | | x | x |
| - Issue x bill | | | x |
| N | 64503793 | 64503793 | 64503793 |
| $R^2$ | 0.091 | 0.126 | 0.201 |

This table presents evidence of the relationship between interest group public position-taking (in the Maplight data) and lobbying. Data is at the issue-bill-interest group level, with bills nested in congresses. The sample consists of groups in the Maplight data who lobby on the issue in question in the congress in question, and bills lobbied on with the relevant issue code during the congress in question. The dependent variable is 1 if the interest group lobbies on the bill, 0 otherwise, the independent variables measure if the interest group is coded as publicly supporting or opposing the bill. Model (1) includes issue-congress fixed effects, (2) and (3) issue-congress-group fixed effects, (3) issue-bill fixed effects. OLS estimates, with standard errors clustered by interest group in parentheses. $^{*}p < 0.05$; $^{\dagger}p < 0.1$.

Table D.2: Interest groups lobby on the bills they express public positions regarding

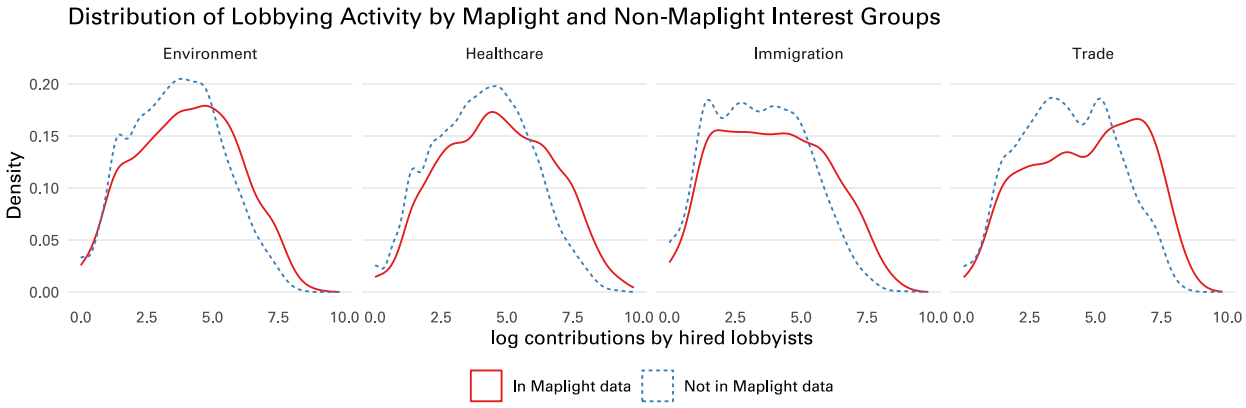


Figure D.1: Interest groups in the Maplight data are larger and lobby more intensively

Each figure plots the distribution of the log number of contributions to legislators by lobbyists hired to lobby on a given issue by an interest group, separating out groups linked to the Maplight dataset for whom we are able to estimate a district-specific ideology.

their lobbying behavior. It is therefore unlikely that interest groups use public pronouncements to advance positions at odds with their lobbying.

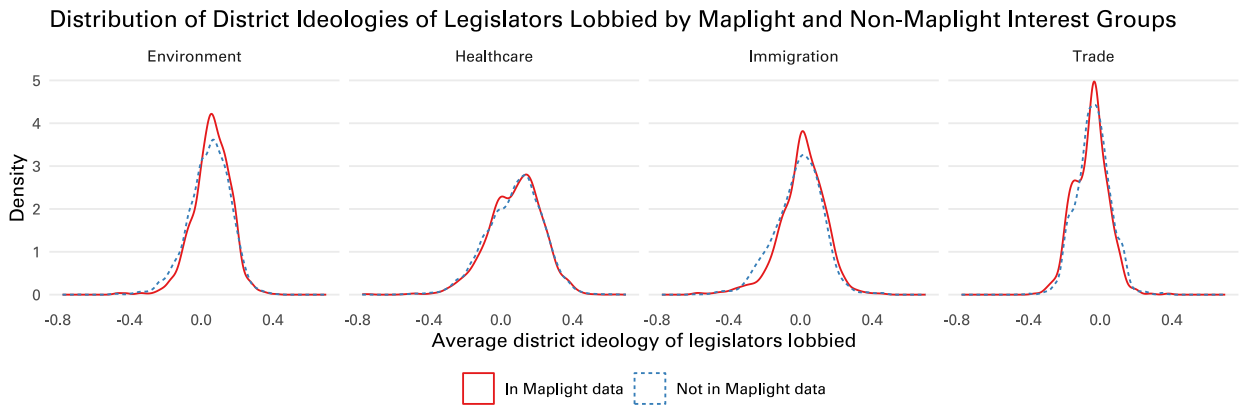


Figure D.2: Interest groups in the Maplight data lobby legislators representing similar districts to those not in the Maplight data

Each figure plots the distribution of the average district ideology of the legislators that a group hires lobbyists connected to, weighted by the number of contributions by hired lobbyists, separating out groups linked to the Maplight dataset for whom we are able to estimate a district-specific ideology.

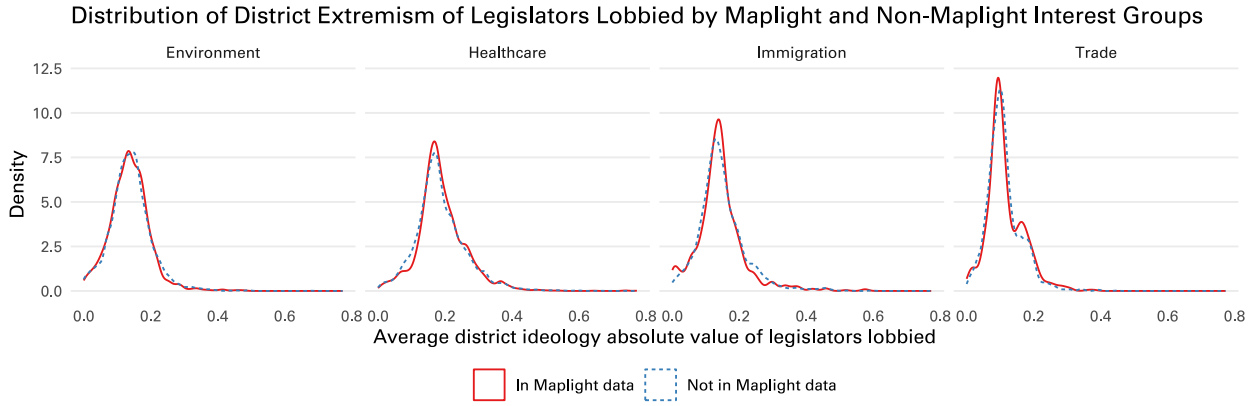


Figure D.3: Interest groups in the Maplight data lobby legislators representing similarly extreme districts to those not in the Maplight data

Each figure plots the distribution of the average absolute value of district ideology of the legislators that a group hires lobbyists connected to, weighted by the number of contributions by hired lobbyists, separating out groups linked to the Maplight dataset for whom we are able to estimate a district-specific ideology.

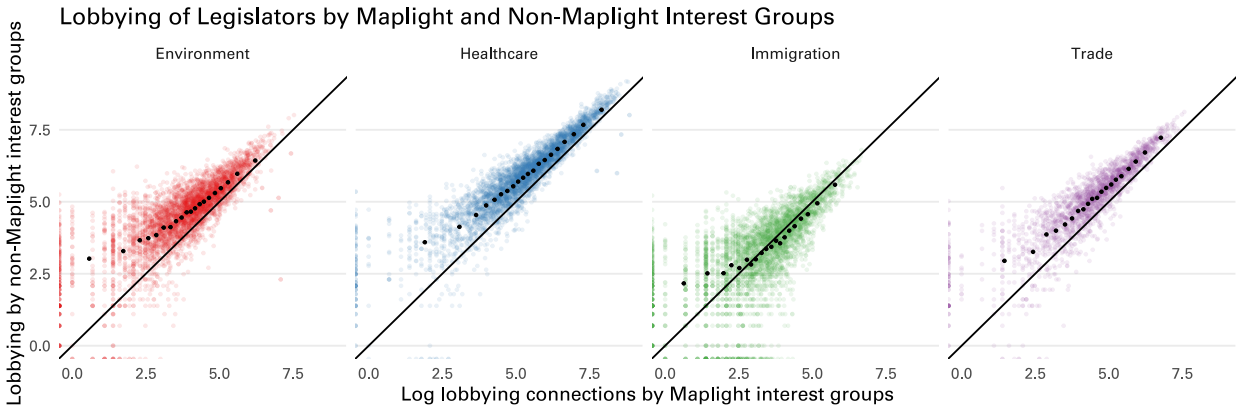


Figure D.4: Legislators are lobbied similarly by interest groups in or not in the Maplight data

Data is at the legislator-issue-congress level. The x axis is the number of contributions by lobbyists hired by Maplight interest groups to lobby on the issue. The y axis is the log number of contributions by lobbyists hired by non-Maplight interest groups. Black lines show the 45 degree line, black dots are binned averages.

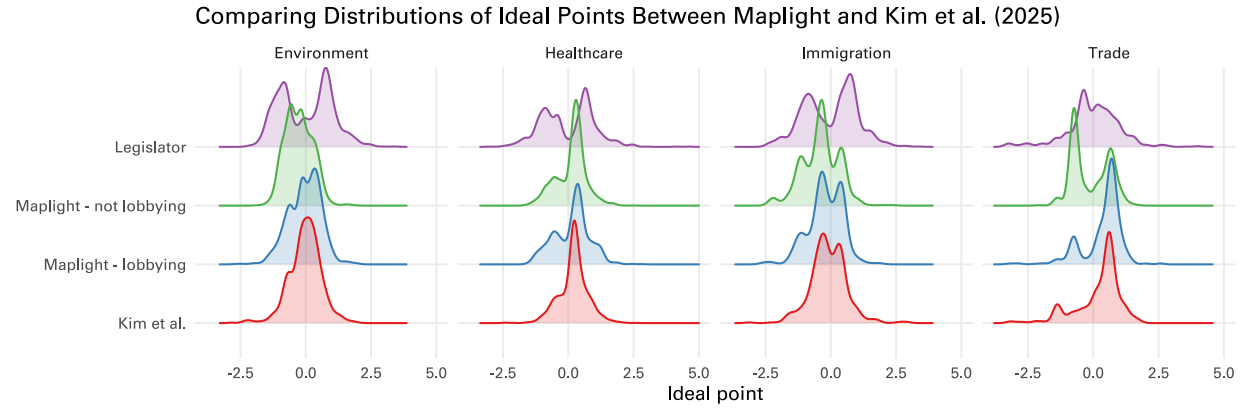


Figure D.5: Ideal points estimated from Maplight data have similar distributions to those estimated from Kim et al. (2025) data

Data is at the interest group-issue level. We jointly estimate issue-specific ideal points using roll-calls, Maplight positions, and positions from Kim et al. (2025). An interest group in the Maplight data is treated as a separate entity to one in the Kim et al. (2025) dataset. The figure shows the densities on each issue area of ideal points for legislators, Maplight groups not linked to lobbying data, Maplight groups linked to lobbying data, and groups in Kim et al. (2025).

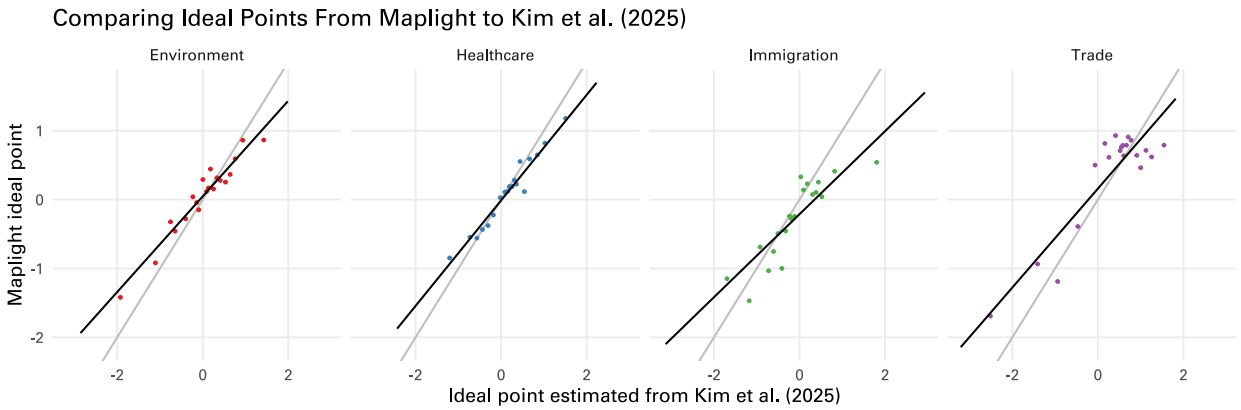


Figure D.6: Ideal points estimated from Maplight data strongly correlate with those estimated from Kim et al. (2025) data

Data is at the interest group-issue level. We jointly estimate issue-specific ideal points using roll-calls, maplight positions, and positions from Kim et al. (2025). An interest group in the maplight data is treated as a separate entity to one in the Kim et al. (2025) dataset. The x axis is the ideal point for the group in inferred from positions in the Kim et al. (2025) dataset, the y axis, its ideal point inferred from Maplight positions. Gray lines show the 45 degree line, black lines are OLS fits, dots are binned averages.

## E MODEL EXTENSIONS AND ADDITIONAL ESTIMATES

### E.1 *Model Extension: Microfounding The Ideology Weights*

A key part of the empirical application of the model involves estimating the relationship between district ideology and legislator ideal points. Here we show that this relationship,

$$\lambda_i = \gamma v_i + (1-\gamma)\xi_i,$$

where $v_i$ is district ideology, can be derived from an extended version of the model in which legislators make tradeoffs between their constituents' preferences and their own idiosyncratic preferences. In this extended model, $\gamma$, the coefficient on district ideology, corresponds to the weight that legislators' place on voter preferences when deciding how to vote.

Legislator $i$ has private ideal point $\xi_i$, and voter $k$ in the district represented by $i$ has ideal point $v_{ki}$. The average ideal point of voters in $i$'s district is $v_i$. Legislator $i$'s district has $N_i$ constituents.

Legislators vote on a number of bills. Bill $j$ would establish policy $p_j$, replacing status quo $s_j$. The utility that voter $k$ receives if the bill passes is $u^p_{kij} = -(v_{ki} - p_j)^2$, and if the bill fails, she receives her utility from the status quo policy: $u^s_{kij} = -(v_{ki} - s_j)^2$.

Legislators care about their voters' preferences and their own policy preferences, and are influenced by lobbying. The utility legislator $i$ receives from bill $j$ passing is

$$u^p_{ij} = -(1-\gamma)(\xi_i - p_j)^2 + \frac{\gamma}{N_i}\sum_{k=1}^{N_i} u^p_{kij} + \beta f_{ij}$$

where $f_{ij}$ is the log number of groups that lobby $i$ *for* the bill. $\gamma \in (0,1)$ is the relative weight the legislator places on the average utility of her constituents, $\frac{1}{N_i}\sum_{k=1}^{N_i} u^p_{kij}$, relative to her own preferences. The utility she receives if the bill fails is

$$u^s_{ij} = -(1-\gamma)(\xi_i - s_j)^2 + \frac{\gamma}{N_i}\sum_{k=1}^{N_i} u^s_{kij} + \beta a_{ij} + \varepsilon_{ij},$$

where $a_{ij}$ is the log number of groups that lobby *against* the bill, and $\varepsilon_{ij} \sim G$ is an idiosyncratic preference shock that legislator $i$ has for the status quo on issue $j$.

$i$ votes for the bill if she receives more utility if it passes than if it fails:

$$\begin{aligned} P(i \text{ votes for } j) = P\Bigg( & \varepsilon_{ij} < -(1-\gamma)\left((\xi_i - p_j)^2 + (\xi_i - s_j)^2\right) \\ & - \frac{\gamma}{N_i}\sum_{k=1}^{N_i}\left((v_{ki} - p_j)^2 - (v_{ki} - s_j)^2\right) + \beta(f_j - a_j)\Bigg) \\ = G\left(2\left(\gamma v_i + (1-\gamma)\xi_i\right)(p_j - s_j) + s_j^2 - p_j^2 + \beta(f_j - a_j)\right). & \end{aligned}$$

Note that for $\lambda_i = (\gamma v_i + (1-\gamma)\xi_i)$, this expression is isomorphic to that derived in the main text.

Under the assumption that $\xi_i$ is uncorrelated with $v_i$, $\mathbb{E}[(\xi_i - \bar{\xi})v_i] = 0$, a regression of $\lambda_i$ on $v_i$ estimates $\gamma$. This assumption is reasonable if one thinks of $\xi_i$ as capturing the component of legislator ideology that is not influenced by voters, that is, if voters systematically elect legislators who share their preferences and so vote in line with them, but if there are idiosyncratic deviations from that tendency.

A regression of $R_i$ against $v_i$ then estimates the welfare weight that legislators appear to place on voter preferences, inclusive of lobbying distorting their behavior.

All these derivation assume that voter preferences are measured on the same scale as legislator preferences. In our context that assumption is not satisfied. Nonetheless, the difference in coefficients between regressions of legislative ideology incorporating lobbying ($R_i$) and legislative ideology netting out lobbying ($\lambda_i$) against district opinion still captures a difference in implied welfare weights.

Instead of observing $v_i$, we observe a measure of voter preferences on a different scale, *District ideology*$_i$. We assume the following linear relationship:

$$v_i = \delta \, \textit{District ideology}_i + e_i,$$

where $e_i$ is the component of $v_i$ uncorrelated with $m_i$. Inserting this identity, we have

$$\lambda_i = \gamma\delta \, \textit{District ideology}_i + \gamma e_i + (1-\gamma)\xi_i.$$

Regressing $\lambda_i$ on *District ideology*$_i$, the coefficient on *District ideology*$_i$ corresponds to $\gamma\delta$ and the intercept and error correspond to $\gamma e_i + (1-\gamma)\xi_i$, a mix of components of voter preferences not captured by *District ideology*$_i$, and the legislator's preferences. Regressing $R_i$ and $\lambda_i$ against *District ideology*$_i$, the $\delta$ component would be the same across specifications; the only difference would be in $\gamma$, the weight that legislators appear to place on voter welfare.

### E.2 *Decomposing Estimated Effects*

LEGISLATOR-LEVEL To gain more intuition about the variation driving our estimates of the legislator-level effects of lobbying, note that the loss function being minimized for $\lambda_i$ is

$$\sum_{i=1}^{N}\sum_{j=1}^{J}\left(y_{ij} - \beta\left(f_{ij} - a_{ij}\right) - \alpha_j - \lambda_i F_j\right)^2.$$

Taking the derivative with respect to $\lambda_i$ gives the following first order condition

$$-2\sum_{j=1}^{J}\left(y_{ij} - \beta\left(f_{ij} - a_{ij}\right) - \alpha_j - \lambda_i F_j\right)F_j = 0$$

which we can rearrange to give

$$\lambda_i = \frac{\sum_{j=1}^{N}\left(y_{ij} - \beta\left(f_{ij} - a_{ij}\right) - \alpha_j\right)F_j}{\sum_{j=1}^{J} F_j^2}.$$

If $i$'s propensity to vote for a bill, net of average support for the bill and the effects of lobbying $(y_{ij} - \beta(f_{ij} - a_{ij}) - \alpha_j)$ is positively correlated with the direction of the bill $(F_j)$, then $i$'s ideology $(\lambda_i)$ is more positive. Applying the same derivation to the estimation of $R_i$, which uses the estimated values of $F_j$ and $\alpha_j$ from estimating $\lambda_i$, gives

$$R_i = \frac{\sum_{j=1}^{J}(y_{ij} - \alpha_j)F_j}{\sum_{j=1}^{J}F_j^2}.$$

The difference between the two, which isolates the effect of lobbying, is then

$$R_i - \lambda_i = \frac{\beta\sum_{j=1}^{J}(f_{ij} - a_{ij})F_j}{\sum_{j=1}^{J}F_j^2}.$$

If $i$ tends to be lobbied more in favor $(f_{ij} - a_{ij})$ of bills which shift the status quo up $(F_j > 0)$, the difference between $R_i$ and $\lambda_i$ will be more positive.

BILL-LEVEL The average difference between legislator ideal points inclusive and net of lobbying is the average over legislators:

$$\frac{1}{N}\sum_{i=1}^{N}(R_i - \lambda_i) = \frac{\beta}{N}\sum_{i=1}^{N}\frac{\sum_{j=1}^{J}(f_{ij} - a_{ij})F_j}{\sum_{j=1}^{J}F_j^2} = \underbrace{\frac{\beta}{\sum_{j=1}^{J}F_j^2}}_{\text{issue-specific constant}}\sum_{j=1}^{J}\underbrace{\sum_{i=1}^{N}\frac{(f_{ij} - a_{ij})F_j}{N}}_{\text{directional effect of lobbying on bill } j}.$$

This difference can thus be decomposed into a sum over bills of the average over legislators of lobbying for or against the bill $(f_{ij} - a_{ij})$, multiplied by the direction and dispersion of the bill $(F_j)$. These derivations assume that all legislators vote on all bills. With differences in legislator presence the equivalent expression is

$$\beta\sum_{j=1}^{N}\sum_{i=1}^{N}\frac{(f_{ij} - a_{ij})F_j\mathbf{1}_{\{i \text{ votes on } j\}}}{N\sum_{j=1}^{J}F_j^2\mathbf{1}_{\{i \text{ votes on } j\}}}.$$

To measure the bill-level effect on the average difference betwee ideal points inclusive and net of lobbying, we calculate the average of

$$\frac{(f_{ij} - a_{ij})F_j}{\sum_{j=1}^{J}F_j^2}$$

for legislators who vote on bill $j$.

Tables E.1–E.4 give the average values of this parameter for each bill, as well as the factor loading for the bill $(F_j)$ and the average net lobbying on the bill $(\frac{1}{N}\sum_{i=1}^{N}f_{ij} - a_{ij})$. We see that the protectionist average effect of lobbying on trade is due to lobbying in favor of the US Export Finance Agency Act of 2019, the Export-Import Bank Reform and Reauthorization Act of 2015, and the American Manufacturing Competitiveness Act of 2016 (though note there are few bills on trade in this period). The leftwards net effect of healthcare lobbying is

due to lobbying for bills like the Children's Health Insurance Program Reauthorization Act of 2009, which extended the Children's Health Insurance Program to cover certain children of legal immigrants, the Family Smoking Prevention and Tobacco Control Act, and lobbying against the American Health Care Act of 2017 which would have partially repealed the Affordable Care Act.

Table E.1: Bills ordered by average contribution to difference in legislator ideal points with and without lobbying, for environment

| Code | Bill | $F_j$ | $\frac{1}{N}\sum_{i=1}^{N}(f_{ij}-a_{ij})$ | $\frac{1}{N}\sum_{i=1}^{N}\frac{(f_{ij}-a_{ij})F_j}{\sum_{j=1}^{J}F_j^2}$ |
|---|---|---|---|---|
| hr5019-111 | Home Star Energy Retrofit Act of 2010 | -1.201 | 0.157 | -0.004 |
| hr2454-111 | American Clean Energy and Security Act of 2009 | -1.182 | 0.156 | -0.004 |
| hr9-116 | Climate Action Now Act | -1.258 | 0.104 | -0.003 |
| hr3585-111 | Solar Technology Roadmap Act | -0.891 | 0.07 | -0.001 |
| sjres37-112 | A joint resolution to disapprove a rule promulgated by the Administrator of the Environmental Protection Agency relating to emission standards for certain steam generating units. | 1.321 | -0.015 | -0.001 |
| hr2417-112 | Better Use of Light Bulbs Act | 1.259 | -0.049 | -0.001 |
| hr4480-112 | Domestic Energy and Jobs Act | 1.294 | -0.045 | -0.001 |
| hr2126-113 | Energy Efficiency Improvement Act of 2014 | -0.181 | 0.336 | -0.001 |
| hr6190-112 | Asthma Inhalers Relief Act of 2012 | 1.029 | -0.051 | -0.001 |
| hjres36-115 | Providing for congressional disapproval under chapter 8 of title 5, United States Code, of the final rule of the Bureau of Land Management relating to Waste Prevention, Production Subject to Royalties, and Resource Conservation. | 1.281 | -0.031 | 0 |
| ⋮ | ⋮ | ⋮ | ⋮ | ⋮ |
| hr2218-113 | Coal Residuals Reuse and Management Act of 2013 | 1.136 | 0.415 | 0.005 |
| hr3826-113 | Electricity Security and Affordability Act | 1.297 | 0.393 | 0.005 |
| hr5682-113 | To approve the Keystone XL Pipeline. | 1.192 | 0.454 | 0.005 |

| | | | | |
|---|---|---|---|---|
| sjres26-111 | A joint resolution disapproving a rule submitted by the Environmental Protection Agency relating to the endangerment finding and the cause or contribute findings for greenhouse gases under section 202(a) of the Clean Air Act. | 1.322 | 0.094 | 0.006 |
| hr2250-112 | EPA Regulatory Relief Act of 2011 | 1.167 | 0.473 | 0.007 |
| hr2401-112 | Transparency in Regulatory Analysis of Impacts on the Nation Act of 2011 | 1.297 | 0.442 | 0.007 |
| hr535-116 | PFAS Action Act of 2019 | -1.127 | -0.183 | 0.007 |
| hr1941-116 | Coastal and Marine Economies Protection Act | -1.211 | -0.201 | 0.008 |
| hr2467-117 | PFAS Action Act of 2021 | -1.158 | -0.146 | 0.009 |
| sjres23-114 | A joint resolution providing for congressional disapproval under chapter 8 of title 5, United States Code, of a rule submitted by the Environmental Protection Agency relating to Standards of Performance for Greenhouse Gas Emissions from New, Modified, and Reconstructed Stationary Sources: Electric Utility Generating Units. | 1.282 | 0.477 | 0.012 |
| sjres24-114 | A joint resolution providing for congressional disapproval under chapter 8 of title 5, United States Code, of a rule submitted by the Environmental Protection Agency relating to Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units. | 1.297 | 0.558 | 0.014 |

Table E.2: Bills ordered by average contribution to difference in legislator ideal points with and without lobbying, for healthcare

| Code | Bill | $F_j$ | $\frac{1}{N}\sum_{i=1}^{N}(f_{ij}-a_{ij})$ | $\frac{1}{N}\sum_{i=1}^{N}\frac{(f_{ij}-a_{ij})F_j}{\sum_{j=1}^{J}F_j^2}$ |
|---|---|---|---|---|
| hr2-111 | Children's Health Insurance Program Reauthorization Act of 2009 | -1.43 | 0.804 | -0.033 |
| hr1256-111 | Family Smoking Prevention and Tobacco Control Act | -1.017 | 0.661 | -0.019 |

| | | | | |
|---|---|---|---|---|
| s610-117 | Protecting Medicare and American Farmers from Sequester Cuts Act | -1.558 | 0.405 | -0.011 |
| hr1628-115 | American Health Care Act of 2017 | 1.573 | -0.397 | -0.006 |
| hr987-116 | Strengthening Health Care and Lowering Prescription Drug Costs Act | -1.608 | 0.228 | -0.005 |
| hr3922-115 | Continuing Community Health And Medical Professional Programs to Improve Our Nation, Increase National Gains, and Help Ensure Access for Little Ones, Toddlers, and Hopeful Youth by Keeping Insurance Delivery Stable Act of 2017 | 1.553 | -0.321 | -0.005 |
| hr1425-116 | Patient Protection and Affordable Care Enhancement Act | -1.618 | 0.212 | -0.005 |
| hr2-114 | Medicare Access and CHIP Reauthorization Act of 2015 | -0.237 | 1.184 | -0.004 |
| hjres43-115 | Joint resolution providing for congressional disapproval under chapter 8 of title 5, United States Code, of the final rule submitted by Secretary of Health and Human Services relating to compliance with title X requirements by project recipients in selecting subrecipients | 1.669 | -0.16 | -0.004 |
| hr2339-116 | Protecting American Lungs and Reversing the Youth Tobacco Epidemic Act of 2020 | -1.49 | 0.189 | -0.004 |
| ⋮ | ⋮ | ⋮ | ⋮ | ⋮ |
| hr849-115 | Protecting Seniors Access to Medicare Act | 1.029 | 0.166 | 0.002 |
| hr2667-113 | Authority for Mandate Delay Act | 1.5 | 0.139 | 0.002 |
| hr6082-115 | Overdose Prevention and Patient Safety Act | 0.416 | 0.522 | 0.002 |
| hr2-112 | Repealing the Job-Killing Health Care Law Act | 1.66 | 0.125 | 0.003 |
| hr1190-114 | Protecting Seniors' Access to Medicare Act of 2015 | 1.586 | 0.2 | 0.003 |
| hr4-110 | Medicare Prescription Drug Price Negotiation Act of 2007 | -1.501 | -0.129 | 0.003 |
| hr3590-111 | Patient Protection and Affordable Care Act | -1.802 | -0.061 | 0.004 |
| hr3-116 | Elijah E. Cummings Lower Drug Costs Now Act | -1.62 | -0.22 | 0.005 |
| hr5-112 | Protecting Access to Healthcare Act | 1.567 | 0.272 | 0.005 |

| | | | | |
|---|---|---|---|---|
| hr1215-115 | Protecting Access to Care Act of 2017 | 1.525 | 0.384 | 0.007 |
| hr3762-114 | To provide for reconciliation pursuant to section 2002 of the concurrent resolution on the budget for fiscal year 2016. | 1.684 | 0.639 | 0.014 |

Table E.3: Bills ordered by average contribution to difference in legislator ideal points with and without lobbying, for immigration

| Code | Bill | $F_j$ | $\frac{1}{N}\sum_{i=1}^{N}(f_{ij}-a_{ij})$ | $\frac{1}{N}\sum_{i=1}^{N}\frac{(f_{ij}-a_{ij})F_j}{\sum_{j=1}^{J}F_j^2}$ |
|---|---|---|---|---|
| hr4760-115 | Securing America's Future Act of 2018 | 1.156 | -0.632 | -0.03 |
| s744-113 | Border Security, Economic Opportunity, and Immigration Modernization Act | -1.218 | 0.059 | -0.009 |
| hr6-117 | American Dream and Promise Act of 2021 | -1.269 | 0.18 | -0.008 |
| hr6-116 | American Dream and Promise Act of 2019 | -1.273 | 0.169 | -0.008 |
| hr4038-114 | American Security Against Foreign Enemies Act of 2015 | 1.02 | -0.137 | -0.007 |
| hr3004-115 | Kate's Law | 1.183 | -0.135 | -0.007 |
| hr3003-115 | No Sanctuary for Criminals Act | 1.284 | -0.115 | -0.006 |
| hr1603-117 | Farm Workforce Modernization Act of 2021 | -1.147 | 0.141 | -0.006 |
| hr3012-112 | Fairness for High-Skilled Immigrants Act of 2011 | -0.092 | 0.589 | -0.004 |
| hr1044-116 | Fairness for High-Skilled Immigrants Act of 2020 | -0.339 | 0.138 | -0.002 |
| ⋮ | ⋮ | ⋮ | ⋮ | ⋮ |
| s3157-117 | Bridging the Gap for New Americans Act | -0.307 | 0 | 0 |
| s3245-112 | A bill to extend by 3 years the authorization of the EB-5 Regional Center Program, the E-Verify Program, the Special Immigrant Nonminister Religious Worker Program, and the Conrad State 30 J-1 Visa Waiver Program. | -0.008 | 0 | 0 |
| s504-115 | An act to permanently authorize the Asia-Pacific Economic Cooperation Business Travel Card Program | -0.01 | 0 | 0 |
| s5168-117 | Energy Security and Lightering Independence Act of 2022 | -0.139 | 0 | 0 |

| | | | | |
|---|---|---|---|---|
| sjres46-117 | A joint resolution providing for congressional disapproval under chapter 8 of title 5, United States Code, of the rule submitted by the Department of Justice and the Department of Homeland Security relating to Procedures for Credible Fear Screening and Consideration of Asylum, Withholding of Removal, and CAT Protection Claims by Asylum Officers. | 1.334 | 0 | 0 |
| sjres54-116 | A joint resolution relating to a national emergency declared by the President on February 15, 2019. | -1.231 | 0 | 0 |
| hr6136-115 | Border Security and Immigration Reform Act of 2018 | 0.654 | 0.007 | 0 |
| hr3401-116 | Emergency Supplemental Appropriations for Humanitarian Assistance and Security at the Southern Border Act, 2019 | 0.548 | 0.024 | 0.001 |
| hr158-114 | Visa Waiver Program Improvement and Terrorist Travel Prevention Act of 2015 | 0.153 | 0.263 | 0.002 |
| hr5038-116 | Farm Workforce Modernization Act of 2019 | 1.253 | 0.153 | 0.008 |
| hr6429-112 | STEM Jobs Act of 2012 | 1.15 | 0.548 | 0.047 |

Table E.4: Bills ordered by average contribution to difference in legislator ideal points with and without lobbying, for trade

| Code | Bill | $F_j$ | $\frac{1}{N}\sum_{i=1}^{N}(f_{ij}-a_{ij})$ | $\frac{1}{N}\sum_{i=1}^{N}\frac{(f_{ij}-a_{ij})F_j}{\sum_{j=1}^{J}F_j^2}$ |
|---|---|---|---|---|
| hr4863-116 | United States Export Finance Agency Act of 2019 | -2.107 | 0.365 | -0.063 |
| hr597-114 | Export-Import Bank Reform and Reauthorization Act of 2015 | -1.444 | 0.448 | -0.055 |
| hr4923-114 | American Manufacturing Competitiveness Act of 2016 | -0.036 | 1.556 | -0.005 |

| | | | | |
|---|---|---|---|---|
| hr2142-115 | An act to improve the ability of U.S. Customs and Border Protection to interdict fentanyl, other synthetic opioids, and other narcotics and psychoactive substances that are illegally imported into the United States, and for other purposes | 0.003 | 0 | 0 |
| hr4324-115 | Strengthening Oversight of Iran's Access to Finance Act | 2.028 | 0 | 0 |
| hr4476-117 | DHS Trade and Economic Security Council Act of 2021 | -0.867 | 0 | 0 |
| hr5841-115 | Foreign Investment Risk Review Modernization Act of 2018 | -0.012 | 0 | 0 |
| hr6968-117 | Ending Importation of Russian Oil Act | -0.103 | 0 | 0 |
| hr7108-117 | Suspending Normal Trade Relations with Russia and Belarus Act | -0.044 | 0 | 0 |
| hr8351-117 | Formula Act | -0.062 | 0 | 0 |
| hres1168-117 | Reaffirming the economic partnership between the United States and the Caribbean nations and recognizing the need to strengthen trade and investment between the United States and the Caribbean nations, our Third Border. | -0.921 | 0 | 0 |
| hr5788-115 | STOP Act of 2018 | 0.751 | 0.277 | 0.018 |
| hr5430-116 | United States-Mexico-Canada Agreement Implementation Act | 0.428 | 1.382 | 0.05 |

### E.3 *Regression-Based Estimates*

As an alternative, less parametric way to study how lobbying affects the alignment between voters and legislators, we can regress roll-call votes on district ideology, with and without controls for lobbying. Specifically, we estimate the following regressions:

As an alternative way to study how lobbying affects representation, we can run the following two regressions:

$$y_{ij} = \theta \,\text{district ideology}_{ik(j)} + \beta \,\text{lobbied}_{ij} + \alpha_j + \varepsilon_{ij} \tag{6}$$

and

$$y_{ij} = \theta' \,\text{district ideology}_{ik(j)} + \alpha'_j + \varepsilon'_{ij},$$

where $y_{ij}$ is 1 if legislator $i$ votes in the Republican direction on bill $j$, 0 if not, $\text{lobbied}_{ij}$ is a measure of net lobbying of $i$ in the Republican direction on $j$, $\text{district ideology}_{ij}$ is $i$'s district's ideology on issue $k$ of which bill $j$ is an example, $\alpha_j$ and $\alpha'_j$ are bill fixed effects, and $\varepsilon_{ij}$ is the error term. $\theta$ is then a measure of the relationship between district ideology and legislative voting, net of the effects of being lobbied. $\theta'$ is a measure of that relationship inclusive of the effects of being lobbied. The difference $\theta' - \theta$ thus provides a measure of how lobbying changes the relationship between district preferences and legislative behavior.

Table E.5 shows the resulting estimates, using both OLS and logit estimators. The slope of the relationship between district ideology and legislative voting is less steep when controlling for lobbying. This difference indicates that lobbying likely serves to push legislators' votes in the direction of their voters' preferences. Table F.8 shows this result is robust to including roll-call votes and lobbying on trade.

Note however that this estimation strategy requires stronger and less plausible assumptions about roll-call voting than the main estimation strategy in Section 5. Take the model from Section 5. Suppose that legislators' ideal points $\lambda_i$ can be written as a linear function of district ideology and an unobserved component uncorrelated with district preferences: $\lambda_i = \delta \,\text{district ideology}_i + \xi_i$. Such a functional form could emerge if legislators care about their voters' own quadratic preferences, and have their own ideal point orthogonal to those of their voters, as in Appendix E.1. Inserting these into (3) gives

$$P(i \text{ votes for } j) = (\delta \,\text{district ideology}_i + \xi_i)F_j + \beta\,(f_{ij} - a_{ij}) + \alpha_j.$$

If the bills have beeen recoded so that voting for the bill means voting in the Republican direction, this equation is equivalent to (6), if the magnitude of $F_j$ does not vary across bills. This assumption is strong and unlikely to hold in the data; Tables B.10–B.13 indicate that there is substantial variation across bills in how far bills divide left from right-wing legislators. The substantive interpretation of $F_j$ is the distance between the bill proposed and status quo policy $F_j = 2(p_j - s_j)$; there is no reason ex-ante to assume that would not vary across bills.

In addition, the estimate of $\beta$, the effect of lobbying, requires stronger assumptions in this specification, though that difference would not affect conclusions about the relationship between district preferences and legislative voting. Specifically, this estimation assumes lobbying is uncorrelated with the component of legislative ideology not attributable to district ideology ($\xi_i$). If lobbying has no effect on legislative voting, but interest groups target

| | Vote in R direction | | | | | |
|---|---|---|---|---|---|---|
| | (1) | (2) | Difference (x100) | (3) | (4) | Difference (x100) |
| District ideology | 0.885* | 0.883* | 0.208* | 9.372* | 9.360* | 1.193* |
| | (0.027) | (0.027) | [0.12; 0.3] | (0.398) | (0.397) | [0.12; 2.111] |
| log net lobbying in R direction | | 0.042* | | | 0.246* | |
| | | (0.006) | | | (0.045) | |
| Estimator | OLS | OLS | | Logit | Logit | |
| FE: Bill | x | x | | x | x | |
| N | 165505 | 165505 | | 165505 | 165505 | |
| $R^2$ | 0.484 | 0.485 | | | | |
| Pseudo-$R^2$ | | | | 0.519 | 0.520 | |

This table presents evidence of the relationship between district ideology and voting behavior. Data is at the legislator-bill level. The dependent variable is coded as 1 if the legislator votes in the Republican direction, inferred using the discrimination parameters from estimating ideal points, 0 if they vote against the Republican direction. The independent variable is district ideology, estimated by fitting an IRT model to survey data and adjusting with MRP. Models (2) and (4) controls for the log number of groups lobbying the legislator that support the Republican position on the bill, minus the log number lobbying that oppose the Republican position. Models (1) and (2) are estimated by OLS, (3) and (4) are logits. The columns between (2) and (3) and after (4) give the differences in the coefficients on district ideology, multiplied by 100 for legibility. A positive difference indicates that lobbying strengthens the relationship between district ideology and legislative voting. Standard errors clustered by state in parentheses. For the difference, we report the 95% percentile confidence interval, calculated with a fractional random weight bootstrap clustered by state. $^*p < 0.05$; $^\dagger p < 0.1$.

Table E.5: Regression evidence of lobbying aligning legislator behavior with voter preferences

legislators who share their preferences for reasons other than district ideology, this estimation strategy would estimate a positive $\beta$ coefficient. Consistent with that account, the coefficient on lobbying in Table E.5 model (2) is larger than those in Table 3.

## F ROBUSTNESS OF RESULTS TO INCLUDING TRADE

This appendix reproduces results from Sections 4–6 of the main text, including trade as an issue area in addition to the environment, healthcare, and immigration. The key takeaway is that the aggregate results are unchanged, despite difficulties in measuring ideology consistently for trade. Most tables and figures in previous appendices report results including trade separately. This appendix also shows that those which do not are also robust to adding trade.

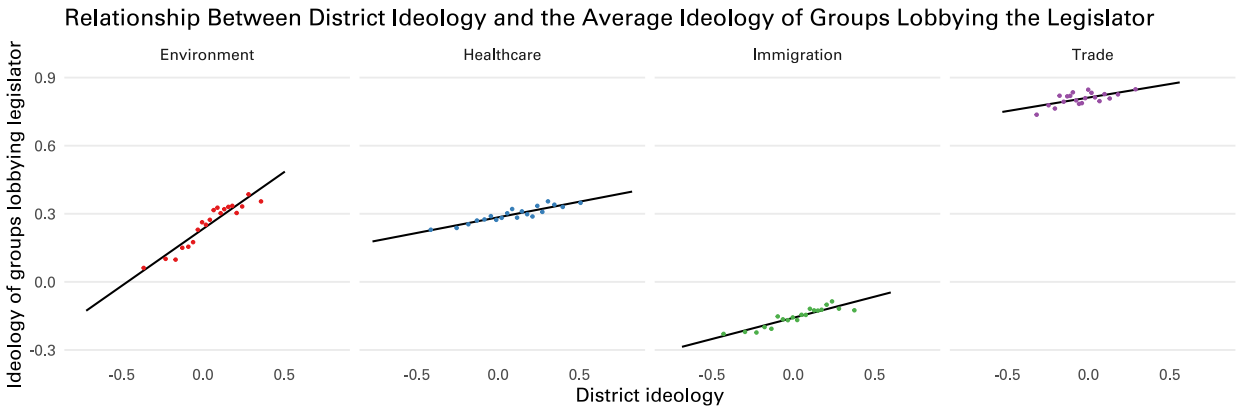


Figure F.1: Representatives of more liberal districts tend to be lobbied by more liberal interest groups, including trade

This figure reproduces Figure 3, adding trade as an issue area. Each figure shows the binned scatterplot of the relationship between district ideology and the average ideology of groups lobbying the legislator, weighted by the number of contributions made by lobbyists hired by each group. Constituency ideology is estimated by running an IRT model on CES survey data; interest group ideology is estimated by running an IRT model on stances on roll-call votes. Note that the district and interest group ideologies are not on the same scale: interest group ideology is scaled so that legislator ideal points have mean 0 and standard deviation 1. Lines show OLS fits.

| | Average ideology of groups lobbying | | | | | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| District ideology | 0.240* | 0.231* | 0.203* | 0.363* | 0.081† | 0.288* |
| | (0.020) | (0.027) | (0.049) | (0.069) | (0.044) | (0.139) |
| Model | OLS | TSLS | OLS | TSLS | OLS | TSLS |
| FE: Issue x period | x | x | x | x | x | x |
| - Issue x district | | | x | x | x | x |
| - Issue x legislator | | | | | x | x |
| First stage F-stat | | 132.1 | | 162.7 | | 29.7 |
| N | 13935 | 13930 | 13935 | 13930 | 13935 | 13930 |
| $R^2$ | 0.585 | 0.578 | 0.676 | 0.675 | 0.771 | 0.771 |

This table replicates Table 2 adding trade as an additional issue. The table presents evidence of the relationship between issue-specific district ideology and the ideology of groups lobbying a legislator, instrumenting for district ideology with ideology predicted based on district demographics. Data is at the congress-legislator-issue level. The dependent variable is the average issue-specific ideal point for groups hiring lobbyings to lobby on the issue who have contributed to the legislator, weighted by the number of such lobbyist contributions. The indepenent variable is district ideology estimated from CES data. Even-numbered models instrument using the weighted average of district ideology for different demographic groups in the first period used in the analysis, weighted by the share of those groups in the district population. All models include issue-congress fixed effects. (3)–(6) add fixed effects for the district (e.g. Utah 1st) interacted with the issue in question, (5)–(6) add legislator-issue fixed effects. Standard errors clustered by state in parentheses. $^{*}p < 0.05$; $^{\dagger}p < 0.1$.

Table F.1: Changes to district ideology due to demographics correlate with changes in the ideology of groups lobbying the representative, including trade

| | Average ideology of groups lobbying | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) |
| District ideology | 0.188* | 0.346* | 0.209* | 0.434* | 0.202* | 0.390* | 0.201* | 0.358* | 0.180* | 1.284* | 0.176* | 0.354* | 0.157* | 1.342† |
| | (0.042) | (0.084) | (0.053) | (0.074) | (0.049) | (0.067) | (0.051) | (0.068) | (0.046) | (0.478) | (0.077) | (0.148) | (0.071) | (0.736) |
| Model | OLS | TSLS | OLS | TSLS | OLS | TSLS | OLS | TSLS | OLS | TSLS | OLS | TSLS | OLS | TSLS |
| FE: Issue x period | x | x | x | x | x | x | x | x | x | x | x | x | x | x |
| - Issue x district | x | x | x | x | x | x | x | x | x | x | x | x | x | x |
| Controls: % College x issue | x | x | | | | | | | x | x | | | x | x |
| - % Black x issue | | | x | x | | | | | x | x | | | x | x |
| - % Hispanic x issue | | | | | x | x | | | x | x | | | x | x |
| - % Male x issue | | | | | | | x | x | x | x | | | x | x |
| - District x issue trends | | | | | | | | | | | x | x | x | x |
| First stage F-stat | | 339.2 | | 102.4 | | 393.5 | | 143.3 | | 10.7 | | 53.5 | | 20.7 |
| N | 13930 | 13930 | 13930 | 13930 | 13930 | 13930 | 13930 | 13930 | 13930 | 13930 | 13935 | 13930 | 13930 | 13930 |
| $R^2$ | 0.676 | 0.676 | 0.676 | 0.675 | 0.676 | 0.676 | 0.676 | 0.675 | 0.677 | 0.676 | 0.750 | 0.749 | 0.750 | 0.750 |

This table shows that the results of Table A.7 are robust to adding trade as an issue area. The table reports the relationship between issue-specific district ideology and the ideology of groups lobbying a legislator, instrumenting for district ideology with values predicted from district demographics. The data are at the congress-legislator-issue level. The dependent variable is the average issue-specific ideal point of groups lobbying the legislator on the issue in question. The indepenent variable is district ideology estimated from CES data. Even-numbered models use an instrumental variable equal to the weighted average of ideological positions of different demographic groups in the first period of the analysis, weighted by each group's population share in the district. All models include issue-by-congress and district-by-issue fixed effects, as in Table F.1, models (3) and (4). Models (1) and (2) control for the share of college graduates in the district, allowing the slope of that relationship to vary by issue area, (3) and (4) do the same for the share of Black residents, (5) and (6) for the share of Hispanic residents, (7) and (8) for the share of male residents. (9) and (10) control for all of these demographic shares, allowing each coefficient to vary by issue area. (11) and (12) adds district-by-issue time trends. (13) and (14) include all these additional controls. Standard errors clustered by state in parentheses. $^{*}p < 0.05$; $^{\dagger}p < 0.1$.

Table F.2: Robustness of the relationship between district ideology and the ideology of groups lobbying the representative, including trade

| | log lobbying connections | | | | | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| District distance to median | $-1.238^{*}$ | $-0.624^{\dagger}$ | $-0.526^{\dagger}$ | $-0.125$ | $-0.163$ | 0.333 |
| | (0.260) | (0.313) | (0.297) | (0.306) | (0.183) | (0.234) |
| Predicted log lobbying connections | | $1.231^{*}$ | | $0.848^{*}$ | | $1.125^{*}$ |
| | | (0.302) | | (0.377) | | (0.290) |
| FE: Issue x period | x | x | x | x | x | x |
| - Issue x District | | | x | x | x | x |
| - Issue x Legislator | | | | | x | x |
| N | 14677 | 14677 | 14677 | 14677 | 14677 | 14677 |
| $R^2$ | 0.358 | 0.361 | 0.599 | 0.599 | 0.792 | 0.793 |

This table replicates Table A.8, adding trade as an issue area. The table reports the relationship between issue-specific district ideology and the extent of lobbying of the legislator. The data are at the congress-legislator-issue level. The dependent variable is the log number of contributions to the legislator from lobbyists hired to lobby on the issue, counting lobbyists hired for multiple lobbying efforts multiple times. The main independent variable is the absolute distance between a district's ideology and that of the median district in the corresponding Congress. Models (2), (4), and (6) control for the predicted number of lobbying connections the legislator based on ideological distance between the district and the lobbying interest groups. All models include issue-by-congress fixed effects; models (3)–(4) add issue-by-district fixed effects, and models (5)–(6) add issue-by-legislator fixed effects. Standard errors clustered by state in parentheses. $^{*}p < 0.05$; $^{\dagger}p < 0.1$.

Table F.3: Legislators with more centrist districts are lobbied more, but this relationship is attributable to interest groups having centrist preferences and lobbying ideologically-close districts, including lobbying on trade

| Issue | $\beta \times 100$ | 95% CI |
|---|---|---|
| Environment | 0.900 | [0.393, 1.476] |
| Healthcare | 1.818 | [1.267, 2.455] |
| Immigration | 0.701 | [-0.519, 1.97] |
| Trade | 3.050 | [1.791, 4.433] |

This table reproduces Table 3, adding trade as an issue area. The table reports estimates of $\beta$, the effect of net lobbying by groups supporting a bill on voting for that bill. Estimates are from an interactive fixed effects model. We estimate separate $\beta$s for different issues. Coefficients are multiplied by 100 to aid interpretation. 95% confidence intervals are calculated using the percentile bootstrap method, clustered by state.

Table F.4: Estimated effects of net lobbying on voting for a bill, including trade

| Legislator ideal point: | Inclusive of lobbying ($R_i$) | | Net of lobbying ($\lambda_i$) | | Difference $(R_i - \lambda_i) \times 100$ | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| District ideology | 1.426* | | 1.425* | | 0.090* | |
| | [1.367; 1.536] | | [1.366; 1.536] | | [0.031; 0.140] | |
| × issue = Environment | | 1.804* | | 1.802* | | 0.230* |
| | | [1.718; 1.932] | | [1.714; 1.929] | | [0.090; 0.393] |
| × issue = Healthcare | | 1.291* | | 1.291* | | 0.018 |
| | | [1.209; 1.418] | | [1.209; 1.418] | | [−0.048; 0.084] |
| × issue = Immigration | | 1.864* | | 1.864* | | 0.033 |
| | | [1.774; 2.015] | | [1.775; 2.014] | | [−0.033; 0.132] |
| × issue = Trade | | −0.963* | | −0.963* | | 0.044 |
| | | [−1.083; −0.860] | | [−1.083; −0.861] | | [−0.150; 0.261] |
| FE: Issue-period | x | x | x | x | x | x |
| N | 15751 | 15751 | 15751 | 15751 | 15751 | 15751 |
| $R^2$ | 0.370 | 0.465 | 0.370 | 0.465 | 0.379 | 0.383 |

This table reproduces Table 4 including roll-call votes and lobbying on trade. The table presents evidence of the relationship between district ideology and legislator ideal points, estimated using factor models. Data is at the legislator-congress-issue level. In models (1) and (2), the dependent variable is the legislator's revealed preference ideal point inclusive of the effects of lobbying ($R_i$), in (3)–(4) the legislator's ideal point net of lobbying ($\lambda_i$), in (5)–(6) the difference between them ($R_i - \lambda_i$), multiplied by 100 for legibility. The independent variable is the district's ideology, in even-numbered models, this is allowed to vary by issue. All models include issue-by-congress fixed effects. 95% percentile bootstrap confidence intervals clustered by state in brackets. * Null hypothesis value outside the confidence interval.

Table F.5: Lobbying aligns legislator behavior with voter preferences, including trade

| | % Roll-calls classified correctly | 95% CI |
|---|---|---|
| With lobbying | 74.391 | [70.547, 75.569] |
| Without lobbying | 74.339 | [70.499, 75.529] |
| Difference | 0.052 | [0.019, 0.094] |

This table reproduces Table 5, adding trade as an issue area. The table reports the results of simulating roll-call votes from data generating processes including or excluding lobbying and then predicting these roll-calls using district ideology on the issue in question. The first row gives the percentage of roll-calls correctly predicted by a logit using district ideology, where roll-calls are generated in a data generating process that includes lobbying, as in Equation (3). The second row uses roll-calls generated by the same data generating process but setting lobbying to zero. The third row gives the difference between the two. The right column gives 95% bootstrap percentile confidence intervals, clustered by state.

Table F.6: Roll-call votes from a data generating process including lobbying are slightly more easily predicted by district ideology, including trade

| | Log issue-specific legislative effectiveness | | | | | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Log lobbying connections | | | | | | |
| on issue | 0.066* | 0.050* | 0.044* | 0.145* | 0.090* | 0.047* |
| | (0.005) | (0.005) | (0.006) | (0.010) | (0.008) | (0.010) |
| on other issues | | | | −0.091* | −0.047* | −0.004 |
| | | | | (0.009) | (0.009) | (0.010) |
| FE: Issue x congress | x | x | x | x | x | x |
| - Issue x district | | x | x | | x | x |
| - Issue x legislator | | | x | | | x |
| N | 15724 | 15724 | 15724 | 15724 | 15724 | 15724 |
| $R^2$ | 0.031 | 0.280 | 0.503 | 0.040 | 0.281 | 0.503 |

This table replicates Table 6, adding trade as an issue area. This table shows the relationship between being lobbied on different issues and issue-specific legislative effectiveness. Data are at the congress-legislator-issue level. The dependent variable is the legislator's log issue-specific legislative effectiveness score. The independent variable in models (1)–(3) is the log number of lobbying connections on that issue and period, that is, the number of contributions made to the legislator by lobbyists hired to lobby on that issue, (4)–(6) include the same but for the other three issues. All models include issue-by-congress fixed effects, (2)–(3) and (5)–(6) add issue-by-district fixed effects, (3) and (6) issue-by-legislator fixed effects. Standard errors clustered by legislator in parentheses. $^{*}p < 0.05$; $^{\dagger}p < 0.1$.

Table F.7: Being lobbied on a given issue correlates with legislative effectiveness, while lobbying on other issues is negatively associated with legislative effectiveness, including trade as an issue area

| | Vote in R direction | | | | | |
|---|---|---|---|---|---|---|
| | (1) | (2) | Difference (x100) | (3) | (4) | Difference (x100) |
| District ideology | 0.857* | 0.855* | 0.202* | 8.875* | 8.863* | 1.214* |
| | (0.026) | (0.026) | [0.115; 0.291] | (0.367) | (0.366) | [0.145; 2.138] |
| log net lobbying in R direction | | 0.043* | | | 0.257* | |
| | | (0.006) | | | (0.042) | |
| Estimator | OLS | OLS | | Logit | Logit | |
| FE: Bill | x | x | | x | x | |
| N | 172147 | 172147 | | 172147 | 172147 | |
| $R^2$ | 0.482 | 0.483 | | | | |
| Pseudo-$R^2$ | | | | 0.511 | 0.512 | |

This table reproduces Table E.5, including trade as an issue area. The table presents evidence of the relationship between district ideology and voting behavior. Data is at the legislator-bill level. The dependent variable is coded as 1 if the legislator votes in the Republican direction, inferred using the discrimination parameters from estimating ideal points, 0 if they vote against the Republican direction. The independent variable is district ideology, estimated by fitting an IRT model to survey data and adjusting with MRP. Models (2) and (4) controls for the log number of groups lobbying the legislator that support the Republican position on the bill, minus the log number lobbying that oppose the Republican position. Models (1) and (2) are estimated by OLS, (3) and (4) are logits. The columns between (2) and (3) and after (4) give the differences in the coefficients on district ideology, multiplied by 100 for legibility. A positive difference indicates that lobbying strengthens the relationship between district ideology and legislative voting. Standard errors clustered by state in parentheses. For the difference, we report the 95% percentile confidence interval, calculated with a fractional random weight bootstrap clustered by state. $^*p < 0.05$; $^\dagger p < 0.1$.

Table F.8: Regression evidence of lobbying aligning legislator behavior with voter preferences, including trade

Table F.9: Being lobbied on a given issue correlates with both bill sponsorship and the number of bills becoming laws, including trade

| | Log bills introduced | | | | Log bills passed into law | | | |
|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| Log lobbying connections | | | | | | | | |
| on issue | 0.083* | 0.172* | 0.070* | 0.062* | 0.009* | 0.014* | 0.009* | 0.013* |
| | (0.010) | (0.017) | (0.012) | (0.020) | (0.002) | (0.003) | (0.003) | (0.004) |
| on other issues | | −0.105* | | 0.010 | | −0.006† | | −0.004 |
| | | (0.017) | | (0.021) | | (0.004) | | (0.004) |
| Log bills introduced | | | | | 0.034* | 0.034* | 0.032* | 0.032* |
| | | | | | (0.003) | (0.003) | (0.004) | (0.004) |
| FE: Issue x congress | x | x | x | x | x | x | x | x |
| - Issue x district | x | x | x | x | x | x | x | x |
| - Issue x legislator | | | x | x | | | x | x |
| N | 15724 | 15724 | 15724 | 15724 | 15724 | 15724 | 15724 | 15724 |
| $R^2$ | 0.467 | 0.468 | 0.682 | 0.682 | 0.188 | 0.188 | 0.350 | 0.350 |

This table reproduces Table A.11, adding trade as an issue area. The table shows the relationship between being lobbied on two components of legislative effectiveness: bills introduced and bills that successfully become laws. Data are at the congress-legislator-issue level. The dependent variable in models (1)–(4) is the log number of bills introduced, giving substantive bills 5 times the value of commemorative bills, and substantive and significant bills 10 times the value, as in the calculation of legislative effectiveness scores. The dependent variable in models (5)–(8) is the log number of laws enacted, weighting the content as in the other models. The independent variable is the log number of lobbying connections on that issue and period, even-numbered models also include this variable for the other issues. All models include issue-by-congress and issue-by-district fixed effects, (3), (4), (7) and (8) add issue-by-legislator fixed effects. Models examining laws enacted control for the log number of bills introduced (the dependent variable in models (1)–(4)). Standard errors clustered by legislator in parentheses. $^{*}p < 0.05$; $^{\dagger}p < 0.1$.

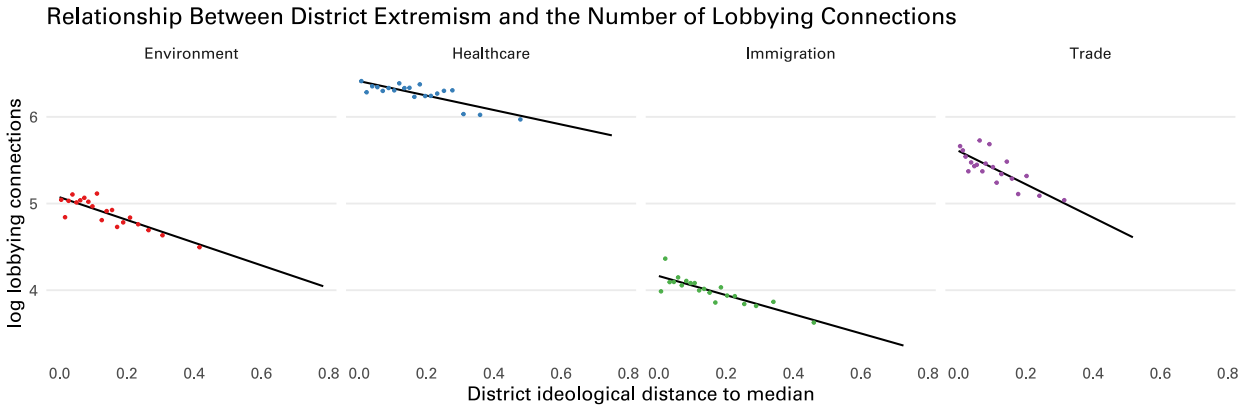


Figure F.2: Representatives of more centrist districts tend to be lobbied more, adding trade

This figure reproduces Figure **??**, adding trade as an issue area. Each figure shows the binned scatterplot of the relationship between district ideology and the log number of lobbyists who have donated to the legislator being hired to lobby on the issue, weighted by the number of contributions made by lobbyists hired by each group. Constituency ideology is estimated by running an IRT model on CES survey data. The x axis is the distance from the district's ideology to the ideology of the median district in that congress. Lines show OLS fits.

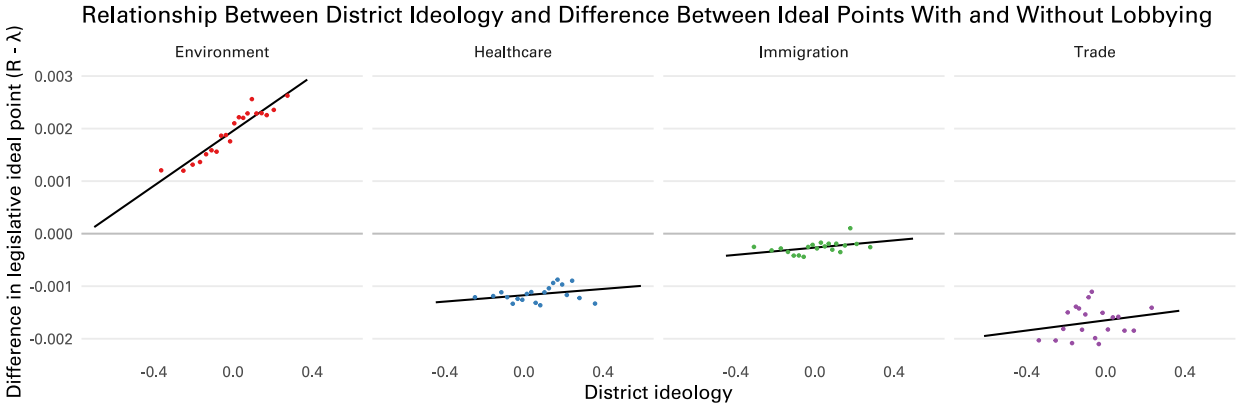


Figure F.3: District ideology and difference in legislator ideal point due to lobbying, adding trade

This figure reproduces Figure 4, adding trade as an issue area. Each figure shows the binned scatterplot of the relationship between district ideology and the difference in legislator ideology attributable to lobbying. The x axis is district ideology measured by running a factor model on CES data. The y axis is the legislator's ideology inclusive of lobbying, minus their ideology net of lobbying. Both are estimated by running an interactive fixed effects model on roll-calls, controlling for lobbying by groups supportive or opposed to the bill; the measure net of lobbying is the estimated factor loading, the measure inclusive of lobbying is the factor loading one would estimate given the same voting behavior but assuming no lobbying.

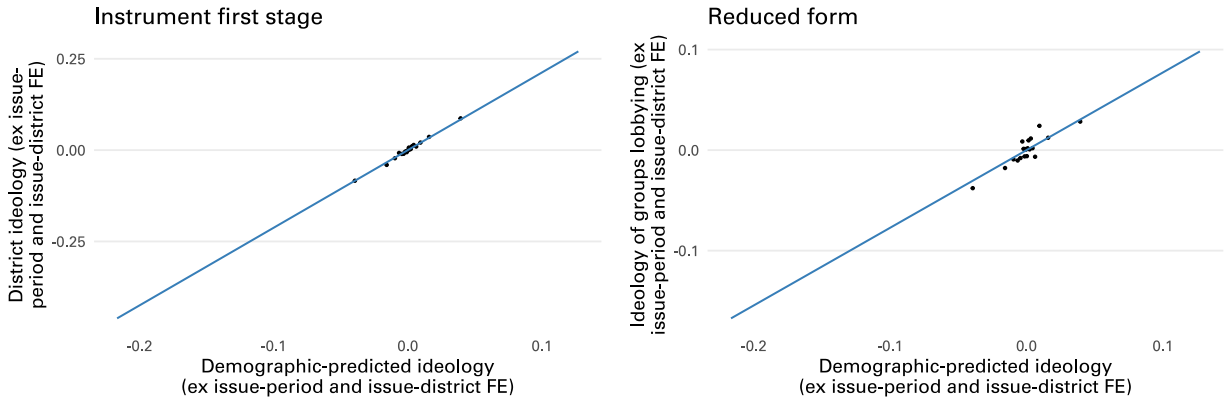


Figure F.4: First stage and reduced form for instrumental variables estimation, including trade

This figure reproduces Figure A.7, adding trade as an issue area. The left panel plots the relationship between district ideology and district ideology predicted based on demographic mix, after residualizing out issue-period and issue-district fixed effects, as in Table F.1 model (4). This shows that the relationship between the instrument and independent variable is positive and monotonic. The right panel plots the relationship between the ideology of groups lobbying the legislator and district ideology predicted based on demographic mix, again after residualizing out fixed effects. It shows that shifts in district ideology due to demographics correlate with shifts in the ideology of interest groups lobbying a legislator. The figures show binned scatterplots and OLS fits.