Lobbying and Legislative Representation*

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October 2025

Abstract

A common concern is that lobbying by interest groups distorts democratic representation by shifting legislators away from their constituents' preferences. We examine whether lobbying harms or enhances legislative responsiveness by analyzing 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, on average, strengthens rather than weakens legislative responsiveness.

*We thank Karam Kang, Shiro Kuriwaki, Jim Snyder, Giulia Leila Travaglini and audiences at Bocconi, UC Berkeley, and the Copenhagen Business School Money in Politics Conference for comments on this project.

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1 INTRODUCTION

A common perception—reflected in both media coverage and public opinion—is that lobbying by interest groups harms democracy. A central concern underlying this view is that interest groups influence politicians in ways that lead legislators to prioritize the interests of these groups over those of their constituents. Narratives about politicians being "captured" by special interests are frequent in media reporting and in advocacy groups' campaigns for political reform. In one 2023 poll, 73% of respondents said that lobbyist and special interest groups have "too much influence" over members of congress, while 70% said constituents have too little influence over their representatives (Pew, 2023). But does lobbying actually harm legislative responsiveness? Whether lobbying distorts legislative behavior depends on how closely the preferences of interest groups align with those of the voters represented by the targeted legislators.

Different theories of lobbying offer distinct predictions about which legislators interest groups target. Quid pro quo theories posit that interest groups seek to buy the votes of legislators who oppose their positions (Snyder, 1991), thereby shifting these legislators toward the groups' preferred policies. In this framework, a group engaged in quid pro quo lobbying has no incentive to lobby legislators who already share its priorities. Furthermore, lobbying risks distorting policy away from voters' preferences. Informational theories of lobbying suggest that interest groups possess private information about policies or constituent preferences, and that transferring this information can reduce the uncertainties legislators face (Hansen, 1991; Austen-Smith, 1993; Lohmann, 1995). This family of theories predicts that interest groups will target persuadable legislators—those who are slightly favorable or somewhat opposed to their position—because the information provided can shift these legislators' views (Wright, 1996). A more recent development of the informational theory emphasizes that interest groups may target their allies, who can serve as intermediaries by transmitting information to other members of the legislature (Schnakenberg, 2017; Awad, 2020). Finally, the theory of lobbying as subsidy offers a prediction that interest groups focus on legislators who are already their champions. By providing resources to these allies, interest groups help make them more effective and encourage them to prioritize the issues the groups care about (Hall and Deardorff, 2006; Ellis and Groll, 2020).

Despite offering different predictions about lobbying targets, most theories of lobbying are largely silent on where legislators' alignment with interest group preferences originates. A vast literature on legislative accountability and responsiveness highlights a major source of legislative behavior: constituents' preferences. Understanding the relationship between elected officials and their constituents has long been a core focus of scholarship on representative

democracy (Miller and Stokes, 1963; Achen, 1977; Bartels, 1991). Most studies analyzing members' roll-call voting find a strong correlation between legislators' votes and district public opinion (Fiorina, 1974; Clinton, 2006), although there has been considerable debate over whether this correlation reflects electoral selection, genuine responsiveness, or party influence (Krehbiel, 1993; Snyder and Groseclose, 2000; Butler and Nickerson, 2011). More recent work by Ansolabehere and Kuriwaki (2022) shows that most constituents who express an opinion on issues have an accurate sense of how their representative voted, and that perceived issue agreement strongly predicts voter approval of their representatives. Beyond roll-call voting, Adler and Lapinski (1997) demonstrates that district characteristics play an important role in explaining members' committee assignments—an important factor shaping members' bill sponsorship (Schiller, 1995), legislative effectiveness (Volden and Wiseman, 2014), and interest groups' targeting strategies (Powell and Grimmer, 2016; Fouirnaies and Hall, 2018).

Given that legislative behavior is highly correlated with constituents' characteristics and preferences, interest groups have strong incentives to pay close attention to public opinion within members' districts when advancing specific policies. Many groups indeed rely on survey and polling firms to continuously monitor district opinion, using this information both to guide their lobbying strategies and to inform legislators about constituent preferences (Hansen, 1991; Loomis, 2003). Although voter preferences are central to the lobbying strategies of interest groups—and form the basis for normative evaluations of lobbying in a democracy—the existing literature on lobbying rarely incorporates voter preferences into its analyses.[1] To fully understand the effects of lobbying on legislative behavior—whether it moves legislators away from voter preferences or not—and ultimately its impact on legislative responsiveness, it is crucial to compare the preferences of interest groups and the voters represented by targeted legislators, and to assess how closely those preferences align.

To answer this question, we examine the relationship between interest group ideology, the legislators they target, and the preferences of those legislators' constituents across four issues: the environment, healthcare, immigration, and trade. We develop issue-specific measures of constituency preferences by scaling responses from hundreds of thousands of survey respondents and using multilevel regression and poststratification to adjust for nonrepresentativeness (Tausanovitch and Warshaw, 2013). We measure the ideology of interest groups and legislators by combining public positions of interest groups from MapLight with legislative roll-call votes following Crosson, Furnas and Lorenz (2020). The resulting measures of legislative and constituent ideology are strongly correlated, even when examining within-

[1]Some notable exceptions include Giger and Klüver (2016) and Gilens and Page (2014), which we discuss in greater detail in Section 2.

legislator-constituency variation across issues, suggesting they capture something distinct from general left-right ideology. Because interest groups are not required to disclose which legislators they lobby under the Lobbying Disclosure Act, we build on evidence that lobbyists use campaign contributions to gain access to legislators (Liu, 2022; Bertrand, Bombardini and Trebbi, 2014; Kim et al., Forthcoming). We infer lobbying connections between interest groups and legislators by linking the lobbyists hired by interest groups to the legislators those lobbyists support through campaign contributions.

Our main results concern the relationship between a legislator's constituency's issue-specific ideology and the ideology of the interest groups that lobby that legislator on that 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 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 influenced by both the legislator's 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 measure of legislator ideology net of the distorting effects of lobbying. Our estimates indicate that lobbying does influence legislative voting, although the effects are small. We use the estimated parameters to compare legislator ideology net of lobbying to legislator behavior that incorporates the distortions of lobbying. On average, the relationship between legislator ideology inclusive of lobbying and district opinion is steeper than that between legislator ideology net of lobbying and district opinion. This finding suggests that lobbying strengthens the connection between district preferences and legislative behavior: lobbying by groups aligned with voters helps push legislators to vote more in line with their constituents.

Finally, we examine how lobbying influences the alignment between voters and legislators' tendency to vote in line with a particular interest group: the US Chamber of Commerce. Using voting with the Chamber of Commerce allows us to study issues like trade where the left-right divide in rollcall voting maps ambiguously onto voter preferences. We largely draw the same conclusions from this analysis: lobbying serves to steepen the relationship between district preferences and voting with the Chamber of Commerce. A notable exception concerns trade. Representatives of more protectionist districts are less likely to vote for bills supported by the Chamber of Commerce. Lobbying however weakens this relationship, because representatives of protectionist conservative districts are lobbied by pro-business interest groups.

Our paper makes three key contributions. First, we contribute to the literature on lobbying strategy by demonstrating that public opinion is a critical input into how interest groups decide whom to target. While prior work has emphasized factors such as committee membership as determinants of lobbying strategy, we show that interest groups systematically consider constituency preferences on specific issues when selecting their targets. This highlights the importance of district-level public opinion in shaping the dynamics of interest group influence and suggests that interest groups are responsive not just to legislators' institutional characteristics, but also to the preferences of the voters those legislators represent.

Second, our paper provides an updated empirical assessment of the normative implications of lobbying for legislative representation. Hall and Deardorff (2006)'s account of legislative subsidy lobbying, in which lobbying can enhance legislative representation, was motivated by a long standing and largely impressionistic literature which found that lobbyists tend to target allies (Bauer, Pool and Dexter, 1964). We provide a systematic update to this literature, validating this core insight and providing evidence in favor of theories of lobbying that are less harmful to democracy. We also use new data and methods to study how lobbying distorts legislative representation, and challenge the oversimplified view that lobbying entails interest groups capturing legislators and moving them away from their constituents.

Third, our paper advances the literature on political representation by showing how lobbying functions as an input into the representational process and by offering a tractable framework for studying 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 allows us to assess how factors that influence legislative behavior—including lobbying—ultimately shape the extent to which legislators represent their constituents. In doing so, we provide both empirical evidence and a methodological template for future work on how external pressures interact with legislator preferences to affect 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 those of the general public are misaligned, and that political activity by interest groups tends to move policy away from what the public prefers.

But does this core assumption hold? While a vast body of research underscores the political power of organized interests—especially business groups—over unorganized or diffuse public interests (Schlozman, Sidney and Henry, 2012), relatively few studies directly compare the policy preferences of interest groups and citizens, or examine how each influences legislative behavior. Two notable exceptions stand out. The first is Giger and Klüver (2016), who 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. However, they do not directly measure interest group preferences on specific policies. Instead, they assume that sectional groups (e.g., farmers' associations)

consistently diverge from public preferences, while cause groups (e.g., environmental organizations) tend to align with the majority of citizens—though this assumption is not empirically tested in their analysis.

The second is Gilens and Page (2014), who 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 shape US policymaking. They find a negative correlation between the preferences of average citizens and those of business interest groups, and their analysis 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 the list includes nationally influential organizations, its scope is limited—especially considering that more than 10,000 groups register to lobby at the federal level each year. Moreover, their analysis is conducted at the aggregate level—assessing whether average public opinion across different groups is associated with policy change—rather than at the level of individual legislators. As a result, it is difficult to determine whether interactions with interest groups distort legislative behavior away from voters' preferences at the representative level.

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 are strongly correlated with 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 Rassmussen and Otjes (2025), 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. By contrast, the influence of interest groups in their study appears limited to reinforcing the positions of legislators already predisposed to share their views. The tension between these two perspectives—interest group distortion versus voter-driven responsiveness—raises a fundamental 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; Lohmann, 1995). 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).

One valuable form of information that interest groups can provide to legislators is insight into whether their constituents are likely to support a particular policy. Research shows that legislators often have inaccurate perceptions of public opinion in their districts (Broockman and Skovron, 2018; Hertel-Fernandez, Mildenberger and Stokes, 2019; Pereira, 2021). However, when legislators are presented with district-specific survey data on policy issues, they 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, emphasizing the informational role 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.

If interest groups target legislators whose constituents already share the group's policy

preferences, and if they provide legislative subsidies and relevant information, these interactions can enhance legislative responsiveness to voters. Denzau and Munger (1986) offer a theoretical model demonstrating how constituency preferences constrain the influence of interest groups. Their framework shows that even unorganized voters can be effectively represented, as legislators must balance the electoral costs of deviating from constituent preferences against the benefits of interest group support.

Bringing together voters, politicians, and interest groups reveals a different picture of how lobbying influences democratic representation. While lobbying is often viewed as a force that distorts policymaking, the actual impact on legislative responsiveness depends on the alignment between interest group preferences and those of constituents. If interest groups target legislators whose districts already support their positions—and provide resources that enhance legislative capacity—then lobbying may reinforce, rather than undermine, responsiveness. 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, on 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 provide a detailed description of each component.

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

Table 1: Overview of preference estimation

3.1 *Public Opinion*

Our primary source of public opinion data is the Cooperative Election Survey (CCES). We make use of issue-specific survey questions to scale states and congressional districts. This

estimation proceeds in two stages, as in Tausanovitch and Warshaw (2013). In the first stage, we fit an IRT model to issue-specific survey data. Doing so allows us to place individuals answering different sets of survey questions on a common scale. We use the algorithms developed by Imai, Lo and Olmsted (2016), which implement the quadratic one-dimensional model of Clinton, Jackman and Rivers (2004). As in Clinton, Jackman and Rivers (2004), we use matrix factorization to calculate starting values. We rotate the measures so that higher scores correspond to policy preferences closer to those preferred by congressional Republicans, and scale them so that the mean on each issue is 0 and the variance 1. Tables A9–A13 report the survey questions, sample sizes, and estimated discrimination parameters for the questions. Before fitting the IRT models we recoded the questions so that positive answers correspond to more conservative positions. It is thus reassuring that the estimated discrimination parameters—the parameters that relate the respondents' ideology to the probability of giving a positive answer—are positive for all questions.

In the second stage, we use multilevel regression with post-stratification to correct for the potential non-representativeness of the CCES data. We estimate models with fixed effects for combinations of respondents' race and education and gender and education, and random effects for congressional districts nested within states, and post-stratify onto race-gender-education data from the American Community Survey at the congressional district or state level.

One might be concerned that these various specification choices—how to scale ideology and whether to correct for non-representativeness—influence our substantive conclusions. Such concerns are not warranted. Figures A18 and A19 compare the district-by-issue estimates of ideology using IRT to those estimated with factor models (Heckman and Snyder, 1997) or fixed effects models (as in Fowler and Hall 2016), and show the three measures are extremely closely correlated. 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. The similarity between the fixed effects and IRT measures raises confidence that the small number of questions per respondent is not biasing the estimates of district-level ideology. Similarly, Figure A20 shows that multilevel regression with poststratification does not make much of a difference to our estimates of district ideology, which makes sense given the large sample size of the CCES. While there are theoretical reasons to prefer the MRP estimates, this should not affect our conclusions.

3.2 *Group and Legislator Positions*

To estimate the issue-specific positions of interest groups and legislators, we follow Crosson, Furnas and Lorenz (2020) and combine data on groups' public positions on bills from Maplight with legislators' rollcalls on the final vote on bills. We use the Congressional Research Service's Policy Area coding to classify bills in specific areas. As above, on each issue we estimate the Clinton, Jackman and Rivers (2004) quadratic ideal point model using the algorithms from Imai, Lo and Olmsted (2016), and rotate the resulting ideal points so that they are positively correlated with the legislators' first-dimension DW Nominate scores. For each issue, this approach gives measures of legislator and interest group preferences on the same scale. We scale the ideal points so that the mean and variance of the legislator ideal points are zero and one respectively.

Figure 1 shows the distributions of these ideal points for the four issues, separating out Republican and Democratic legislators, and interest groups that do and do not lobby (explained below). Tables A14–A17 show the interest groups that receive the highest and lowest ideal point estimates on each issue. These illustrate the validity of our approach: for instance, pro-immigration groups like the Immigrant Legal Resource Center, and anti-immigration groups like Californians for Population Stabilization, appear on the opposite ends of the spectrum. The environmental ideal points compare environmental groups (low) to energy industry groups (high). The healthcare spectrum ranges from unions and pro-abortion groups (low) to anti-abortion groups and health insurance industry groups (high). The trade spectrum ranges from unions and ennvironmental groups (low) to libertarian groups and exporting industries (high). Across issues, lobbying groups tend to be more centrist than legislators, as in Crosson, Furnas and Lorenz (2020).

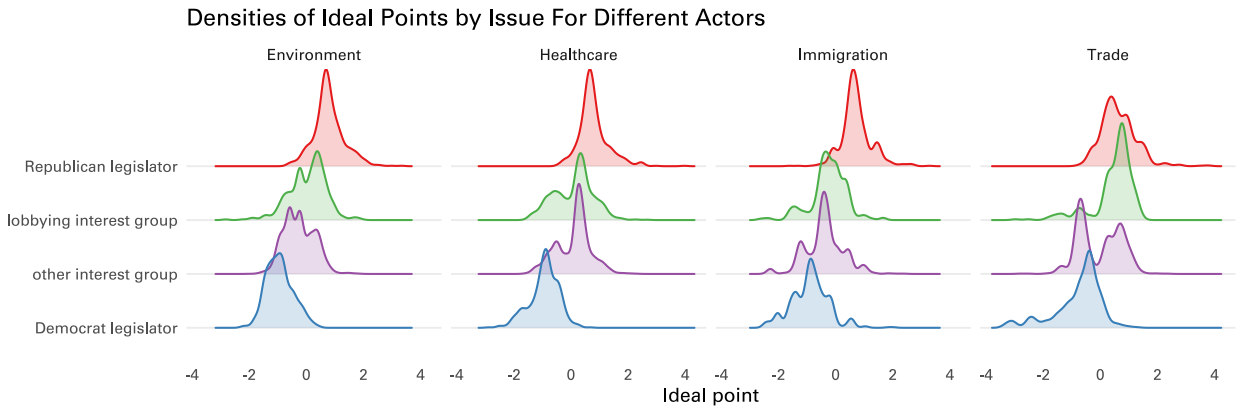

Figure 1: Distribution of legislator and interest group ideal points by issue

Figure 2 shows that district and legislator issue-specific ideology are strongly correlated

on all issues except trade. Table A27 shows that this positive association is not simply due to districts that are more conservative in general electing more conservative legislators: it is robust to the addition of issue-specific controls for the legislator's Nominate score, and legislator fixed effects. These exercises raise our confidence that the district, legislator and interest group ideology relate to one another: districts that are more conservative on a specific issue tend to be represented by legislators who are also more conservative on that issue.

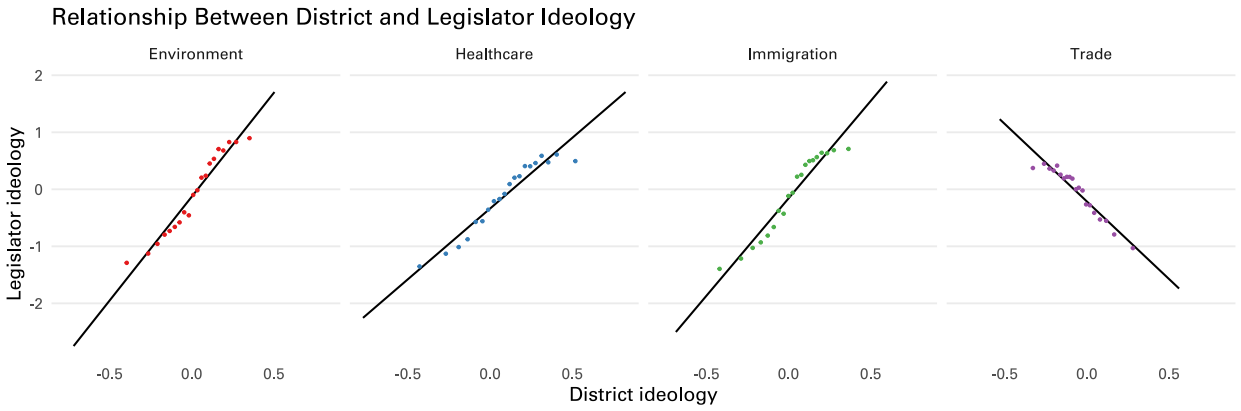

Figure 2: District and Legislator Ideology are Positively Correlated

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 CCES survey data; legislator ideology is estimated by running an IRT model on rollcall votes. Lines show OLS fits.

The negative relationship between district and legislator ideology on trade is due to the changing positions of the parties on trade during the period studied. We investigate this pattern in greater detail in Appendix D. Prior to the 113th congress, Republican legislators were far more supportive of trade. Because of this partisan divide, more positive legislative ideal points on trade correspond to voting with the Republican majority, and so the substantive interpretation of the ideal points becomes unclear as the parties realign on trade. From the 113th congress onwards, legislators with higher trade ideal points tend to vote in a more protectionist direction, as inferred from the rate at which they vote in line with the position taken on bills by the Chamber of Commerce (Figure 7), which is widely considered to be pro-trade (Kim and Osgood, 2019). This same problem affects interest group scores of legislators, which use their entire voting history. Figure A9 shows that our trade ideal points, rotated so that higher scores indicate support for free trade, are negatively correlated with the ratings given to legislators by Public Citizen, a protectionist interest group. The most free trade districts, as inferred from survey questions on the Trans-Pacific Partnership (championed by the Obama administration) and the Trump Administration's tariffs, tend to elect Democrats. Across the entire period for which we have data, there is a

positive relationship between district support for trade and legislators voting in line with the Chamber of Commerce's priorities on trade (Figure A11), but not a consistent relationship between district support for trade and legislator ideal points (Figure A12).

3.3 *Lobbying*

Ideally we would measure which interest group lobbied which legislator on which issue. Doing so is complicated by the fact that lobbyists are not required to disclose who they lobby under the Lobbying Disclosure Act (You, 2020). Instead, we make use of the requirements that interest groups disclose which lobbyists they hire, and that lobbyists disclose to whom they donate. We build on the finding that lobbyists' connections to legislators are valuable (Bertrand, Bombardini and Trebbi, 2014; Hirsch et al., 2023). Lobbyists are able to charge more if they have connections to key legislators and align their lobbying activities with the the issue specialization of those legislators (Bertrand, Bombardini and Trebbi, 2014). These patterns suggest that interest groups hire specific lobbyists to reach specific legislators. As in Bertrand, Bombardini and Trebbi (2014), we infer connections between lobbyists and legislators from contributions made by the lobbyists to the legislators in a given year, which are disclosed under the Lobbying Disclosure Act.

In each year, an interest group has to disclose which issues it lobbied on, which branch of government, and which lobbyists it hired to do so. 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 over a given session of congress gives our interest group-by-legislator-by-congress-by-issue measure of lobbying connections. The data on lobbying is from the Senate Office of Public Records and Kim (2018). Tables A28 and A29 report descriptive statistics for connections between lobbyists, interest groups, and legislators. The median lobbyist hired on a given issue in a given period is hired by one interest group, and contributes to 4–5 legislators depending on the issue. The median interest group lobbying files 4–5 reports on a given issue in a given period, hiring 2 distinct lobbyists, and connecting to 9–15 legislators. Table A30 reports the average number of report-by-lobbyist-by-legislator-by-contribution connections, which we use to measure the intensity of lobbying activity. The distribution of the numbers of connections between interest groups and lobbyists and between lobbyists and legislators is right-skewed, with means considerably larger than medians.

We validate the measure of lobbying by showing it is very strongly correlated with issue-specific legislative effectiveness in Table A31 (Volden and Wiseman, 2014, 2018). Legislative effectiveness scores measure both how much legislation a legislator introduces, and how far that legislation progresses towards being implemented. A strong correlation between lobbying

and legislative effectiveness makes sense either because groups lobby legislators they know to be effective, who are better-positioned to influence policy, or because lobbying makes legislators more effective through the provision of resources. This association is not just due to more effective legislators receiving more contributions from lobbyists in general: it holds with period-by-legislator fixed effects which account for some legislators being more effective across all issues.

3.4 *Representativeness of the Maplight Data*

This paper uses Maplight data to infer groups' positions and investigate how those positions relate to their lobbying strategies. Two plausible concerns are first, that groups in the Maplight dataset are unrepresentative of lobbying groups as a whole, and, second, that groups' publicly expressed preferences differ from those they privately promote via lobbying. We address these concerns in Appendix A. Groups in the Maplight data do differ from other lobbying groups, in that they lobby more intensively (Figure A1). They do not differ in terms of the ideologies of the districts of the legislators that they lobby (Figure A2), nor of the extremism of those districts (Figure A3). 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 patterns, we find similar distributions of estimated ideology (Figure A5). To the second concern, we show that groups are far more likely to lobby on the issues on which they take public stances (Table A2), suggesting public statements picked up by Maplight are complements to, rather than substitutes for, lobbying. Using the data from Kim et al. (2025), we show that the ideology of a group estimated from its public positions in Maplight is positively and extremely strongly correlated with its ideology estimated from its lobbying behavior. In total, these checks indicate that the Maplight data is broadly representative of major groups that lobby, and that the positions groups express publicly are likely close to those 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. With our measures of interest group ideology and lobbying patterns, we calculate the average ideology of groups lobbying each legislator on each issue in each congress. We weight lobbying interest groups by the number of contributions by lobbyists hired. We regress lobbying group ideology against constituent ideology. The logic of this exercise is to distinguish between alternative models of lobbying. If quid pro quo lobbying predominates, then on average representatives of more conservative districts should

be lobbied by more liberal interest groups. Liberal interest groups have no incentive to lobby representatives of liberal districts whose representatives likely share their preferences anyway. Alternatively, if subsidy or informational lobbying predominates, conservative interest groups have strong incentives to lobby representatives of conservative districts, who likely share their preferences, and whom a transfer of resources from the interest group would enable to press for conservative issues. Similarly, if interest groups try to persuade legislators to support an issue by convincing them that their constituents support the issue, we should see representatives of districts that are more conservative being targeted by more conservative interest groups.[2]

Because of the ambiguous relationship between district and legislator and interest group ideology on trade, we exclude trade from the analyses in this and the following sections. This decision is not consequential: Appendix E shows that all aggregate results from these sections replicate including trade. Section 6 presents alternative strategies for studying how lobbying affects representation on trade.

Figure 3 shows the raw relationship between these variables for each issue area. Across issues, representatives of more conservative districts are lobbied by more conservative interest groups on average.

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

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

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, α_{jt} is a fixed effect for issue j in period t, and γ_{ij} is a fixed effect for district i on issue j. Note that all fixed effects are interacted with the issue in question; this specification is equivalent to running a separate regression for each issue with district and period fixed effects and then averaging the coefficients across these regressions. Within district-issue variation in district ideology is driven by changes in the composition of the district and changes in the policy preferences of existing residents. In additional specifications we add legislator-issue fixed effects, which further isolates variation

[2]An advantage of studying the relationship between district and lobbying group ideology is that these conclusions do not require us to place voters and interest groups on the same scale. In the appendix, we do also report specifications relating the distance between interest group and constituent ideology to lobbying; to do so we place constituent ideology on the same scale as legislators and interest groups by regressing legislator ideology against constituent ideology. We find a robust negative relationship between ideological distance between an interest group and legislator's constituents and the probability of the interest group lobbying that legislator (Table A32 and Figure A21). Hill and Huber (2019) point out that it can be difficult to jointly scale voters and legislators—even with data on their expressed preferences on the same issues—because the two inhabit very different information environments.

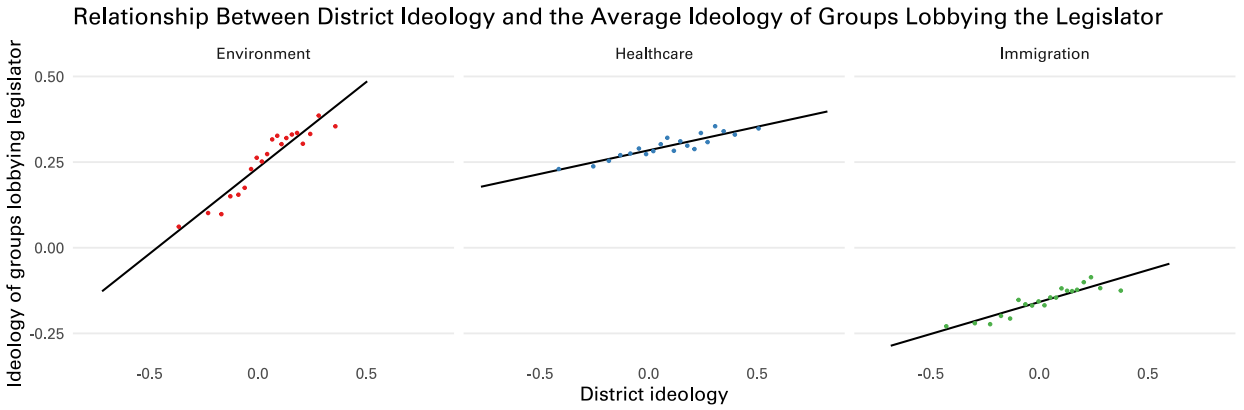

Figure 3: Representatives of more liberal districts tend to be lobbied by more liberal interest groups

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 CCES survey data; interest group ideology is estimated by running an IRT model on stances on rollcall 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.

in ideology on a given issue in a given district within the tenure of a given legislator.

One concern with estimating equation (1) is that interest groups themselves could influence district ideology. One way that interest groups might persuade legislators is by persuading constituents. If such "outside lobbying" were effective, it would create conceptual difficulties in studying 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. The existing empirical evidence downplays this concern. 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 rule out the concern that interest group influence on district ideology accounts for our results, we develop an instrument for district ideology exploiting changes to the demographic composition of districts. Specifically, we use the American Community Survey data to divide each district in a given congress into mutually exclusive and collectively exhaustive components, by gender, race, and education. Write the share of the population of district i in period t with the particular gender, race, and education combination k as σ_{itk}. For instance, σ_{itk} could be the share of Black female college-graduates or the share of Asian male high-school graduates in a particular district. Because these groupings are mutually exclusive and collectively exhaustive, we have $\sum_k \sigma_{itk} = 1$ for all i and t. One way to predict district ideology is to calculate the average ideology in all districts for each gender, race, and

education combination in a base period, and then take the weighted average of these grid cell ideologies, weighted by the population share in the district:

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

where $\textit{Ideology}_{jkb}$ is average ideology on issue j for individuals with characteristics k in base period b. Changes in $\textit{Demographic-predicted ideology}_{ijt}$ within a given district and issue-area over time are due to changes in the demographic shares (σ_{itk}), not in the ideology on a given issue of any demographic group, which is fixed to the base period. For instance, 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. However if college graduates as a whole became more supportive of immigration, that would not change $\textit{Demographic-predicted ideology}_{ijt}$. While one might be concerned that interest groups affect the preferences of voters, and perhaps try to persuade entire demographics, it is implausible that they alter the demographic composition of key districts.

Table 2 shows the resulting estimates. Model (1) just 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 1 (in the case of interest groups, so that legislator ideal points have standard deviation of 1). The model (1) coefficient indicates that a standard deviation shift right in voter ideology corresponds to a legislator being lobbied by groups on average more conservative by around a quarter of a standard deviation for legislators. Model (3) adds district-issue fixed effects, as in Equation (1), which gives a similar coefficient. (5) adds legislator-issue fixed effects and so restricts to variation within a given legislator's tenure, for instance if their district becomes more conservative on a given issue, doing so results in a slightly smaller estimate, which makes sense if part of the way district ideology affects lobbying activity is through replacement of out of step legislators.

Odd-numbered models present two stage least squares (TSLS) estimates, instrumenting for district ideology using the district demographic mix. Across specifications the first stage is strong, and Figure 4 shows the relationship is approximately monotonic. The coefficient on district ideology is positive, and in the more restrictive specifications somewhat larger than the OLS coefficient, though less precisely estimated. The positive coefficients after isolating a component of changes in district ideology that cannot be influenced by interest groups rules out explanations driven by interest group manipulation of both voters and legislators. The difference in magnitudes relative to the OLS coefficients makes sense in that TSLS estimates a local average treatment effect for compliers, in our case, districts that move left or right

	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

This 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 CCES data. Odd-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 2: Changes to district ideology due to demographics correlate with changes in the ideology of groups lobbying the representative

on a given issue due to demographic change. Interest groups may be more responsive to changes in district opinion due to demographics that are easier to predict and forecast, than to within-demographic changes in ideology.

In Tables A33 and A34 we study the relationship between an interest group's ideology on a given issue and the ideology on other issues of legislators and districts it lobbies on other issues. Doing so shows that there is substantial within-interest group variation across issues in lobbying activity. Interest groups with more conservative stances on the environment do tend to also lobby more conservative districts on healthcare, but not on immigration, while interest groups with more conservative positions on immigration do not tend to lobby more conservative districts on healthcare or the environment.

LOBBYING CENTRISTS Representatives of more ideologically centrist districts tend to be lobbied more. Figure 5 illustrates this pattern, plotting the log number of lobbyists connected to a legislator hired to lobby on an issue, against the difference in issue-specific ideology

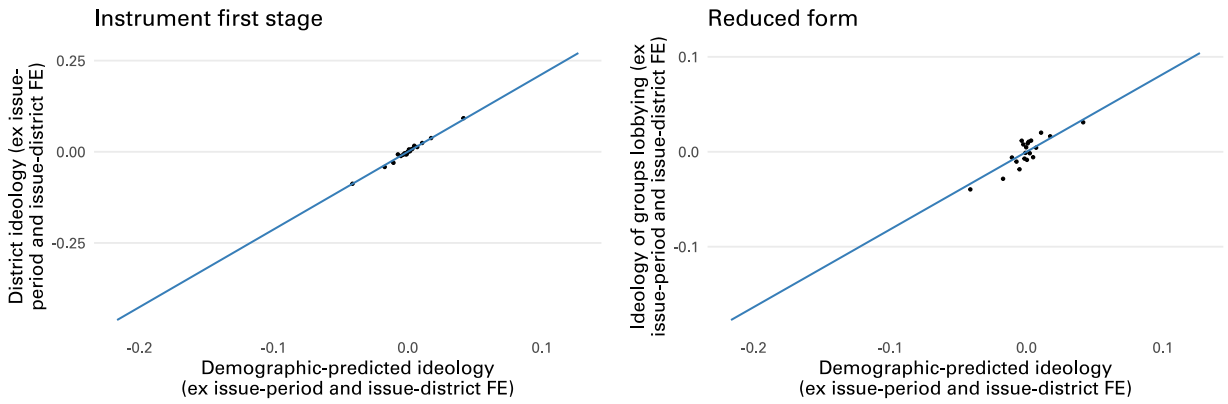

Figure 4: First stage and reduced form for instrumental variables estimation

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 2 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.

between that legislator's district and the median district in the period in question. On all issues, representatives of more extreme districts tend to be lobbied less frequently.

This pattern makes sense given the evidence thus far. Lobbying interest groups tend to be less extreme ideologically than legislators (see Figure 1), and tend to lobby representatives of ideologically-close districts (Table A32 and Figure A21). Because centrist districts are ideologically closer to lobbying interest groups, we would expect their representatives to be lobbied more.

Some quid pro quo accounts of lobbying also make the prediction that centrists are lobbied more frequently. In these accounts, centrist legislators—who likely represent centrist districts—require less effort to influence than those opposed to the lobbying interest group, but might not vote in line with the interest group in the absence of being lobbied.

Table 3 provides a test of these competing theoretical expectations. Specifically, we estimate the log number of groups lobbying a legislator by fitting a Poisson regression at the legislator–interest group–issue–period level. The model regresses the number of contributions by hired lobbyists on the distance between the interest group and the district, while including interest group–issue–period fixed effects to account for the possibility that certain groups lobby more intensively on specific issues in particular periods.[3] The fitted values from this regression provide the predicted volume of lobbying at the dyad level, conditional on the

[3]As in Table A32, we place districts and interest groups on a common ideological scale by regressing legislator ideal points on district ideal points.

ideological proximity between the district and the lobbying interest groups. We then aggregate these predicted contributions to the legislator–issue–period level, yielding a measure of the expected intensity of lobbying directed at a legislator, given both the ideological orientation of the lobbying groups and that of the district.

Model (1) shows the substantial negative relationship between the distance between a legislator's district and the median district, and the log number of contributions by lobbyists hired to lobby on the issue in question. Model (2) shows that this relationship is largely due to representatives of more centrist districts being closer to lobbying interest groups: it controls for our measure of predicted lobbying based on district ideology, which results in the coefficient on distance to the median attenuating. Models (3)–(6) show that the negative relationship between district extremism and lobbying is not robust to including the issue-district and issue-legislator fixed effects from Table 2. Indeed, in model (6) the coefficient flips and is large and positive.

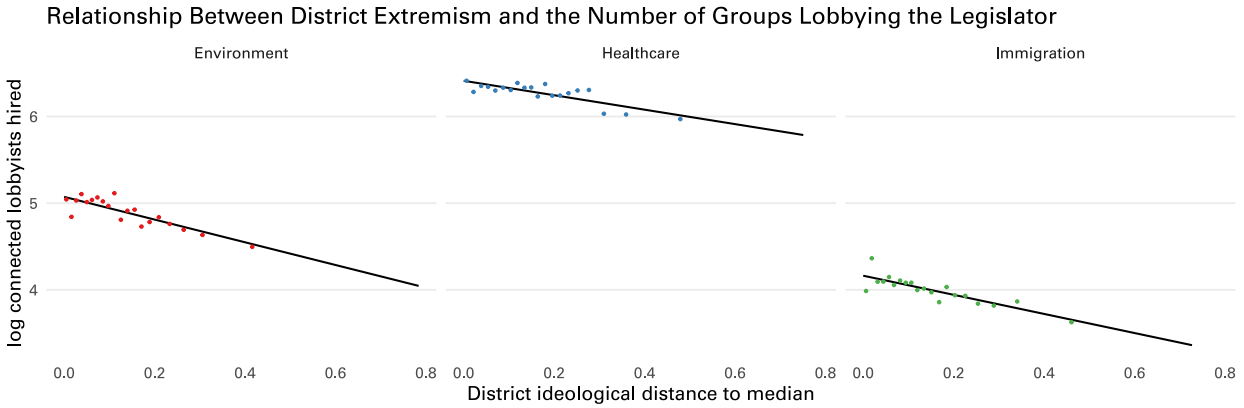

Figure 5: Representatives of more centrist districts tend to be lobbied more

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 CCES 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.

These patterns suggest an explanation for the discrepancy between our findings and those of Giger and Klüver (2016). That study examines the relationship in Switzerland between district preferences—measured with referendum results—and MPs' votes. It finds that MPs lobbied by business groups are more likely to vote in the opposite direction to the majority of their constituents. Our results suggest representatives of more centrist districts are more likely to be lobbied. We would also expect representatives of more centrist districts to more frequently vote against the majority opinion of their districts. It is harder to correctly anticipate the majority position if a district is split 51:49 on an issue, than if it is split 90:10.

	log contributions from lobbyists					
	(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 groups lobbying		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 presents evidence of the relationship between issue-specific district ideology and the ideology of groups lobbying a legislator. Data is 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 a lobbyist hired to lobby in multiple instances multiple times. The main independent variable is the absolute value of the district's ideology on that issue in that period. Models (2), (4), and (6) control for the predicted number of groups lobbying the legislator based on ideological distance from the district to interest groups lobbying. All models include issue-congress fixed effects, (3)–(4) include issue-district fixed effects, (5)–(6) includes issue-legislator fixed effects. Standard errors clustered by state in parentheses. $^{*}p < 0.05$; $^{\dagger}p < 0.1$.

Table 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

A legislator who votes against a 51:49 majority is less out of step with her constituents than one who votes against a 90:10 majority.[4]

5 LOBBYING AND ALIGNMENT WITH VOTERS

Thus far we have analyzed the relationship between district ideology and lobbying activity. The basic takeaway is that legislators lobby representatives with ideologically-close districts, which is consistent with a subsidy mechanism (in which case lobbying has no effect on legislative representation) or an informational mechanism in which interest groups lobby legislators whose districts support an issue in order to convince them to act in line with their constituents' preferences. That the ideology of groups lobbying a legislator responds to the legislator's constituents suggests that lobbying does not distort and may even enhance legislative representation. For lobbying to distort legislative representation there would need to be some misalignment between the groups lobbying a legislator and the legislator's constituents. This section examines directly how lobbying alters the relationship between constituents and legislators.

Our measure of representation is the slope of the relationship between district ideology on an issue and a legislator's rollcall voting. A vast literature dating back to Miller and Stokes (1963) and Achen (1978) conceptualizes the quality of representation in this way (see for instance Ansolabehere, Snyder and Stewart 2001; Tausanovitch and Warshaw 2013 and Olson and Rogowski 2024).[5] To measure this relationship in observed data, one would scale legislative rollcall 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 is that to study the effects of lobbying, one would also need a measure of counterfactual legislative behavior in the absence of lobbying, that is measured on the same scale as the measure of observed legislative ideology.

We construct such measures by developing a model of rollcall voting in which legislators vote in part due to latent ideology and in part due to the distorting effects of being lobbied by groups supporting or opposing the bill. This model generates an interactive fixed effects estimating equation. Estimating the model recovers measures of the net effect of lobbying on legislative voting, spatial bill parameters, and legislators' latent ideology. This measure of

[4]Giger and Klüver (2016) control for "the closeness of the vote among constituents, as it is plausible to expect that it is easier for MPs to defect from the majority of their voters if the difference between supporters and opponents of a policy proposal is small." (197). In their replication code, this variable does not vary across legislators within a referendum, suggesting that it is the closeness of the total referendum, not the result in the legislator's constituency.

[5]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."

latent ideology provides a measure of how legislators would behave in the absence of lobbying. We use the estimated bill parameters to construct a measure of observed legislative behavior incorporating the effects of lobbying, that is measured on the same scale as the measure net of lobbying.

With these quantities in hand, we can study whether shutting down lobbying would strengthen or weaken the relationship between district preferences and legislative ideology. The net effect of lobbying is small, but serves to steepen the relationship between district preferences and legislative ideology.

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

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

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

where f_{ij} is the log number of groups that lobby i *for* the bill. The parameter β governs how effective lobbying is at influencing legislative voting. We would expect $\beta \geq 0$. An interest groups is unlikely to lobby a legislator if doing so would make it less likely that the legislator votes for the group's preferred policy.

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 that lobby *against* the bill, and ε_{ij} is an idiosyncratic preference shock that legislator i has for the status quo on bill j, drawn iid across legislators and bills from a distribution with CDF G.

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

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

ESTIMATION Writing $\alpha_j = s_j^2 - p_j^2$ and $F_j = 2(p_j - s_j)$, we have

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

This equation relates the probability a legislator votes on a bill to a bill fixed effect α_j, the net effect of her being lobbied for and against a bill $\beta(f_{ij} - a_{ij})$ and a legislator-specific loading λ_i which interacts with a bill-specific factor F_j. The legislator-specific loading corresponds to the legislator's ideal point. The bill factor F_j corresponds to the relative positions of the two proposals and the distance between them: a positive F_j indicates that the proposal p_j has a more positive value than the status quo s_j. A legislator with a more positive ideal point λ_i is more likely to vote for a bill that replaces the status quo with a more positive policy. An F_j large in magnitude indicates that the proposal and status quo are far apart, and so the bill will separate legislators of different ideologies.

The decomposition of voting into a bill fixed effect and interactive component is standard in the ideal point estimation literature (Heckman and Snyder, 1997; Clinton, Jackman and Rivers, 2004). Where this model differs is including the effects of lobbying, a_{ij} and f_{ij}.

Different ideal point models make different assumptions about the voter-bill preference shock ε_{ij}, and thus about the link function G. In Clinton, Jackman and Rivers (2004), it is normal, giving a probit estimator, or logistic, giving a logit estimator. In Heckman and Snyder (1997), it is uniform, giving a linear probability model.

If we make the additional assumption that the distribution of ε_{ij} is uniform over the $[0, 1]$ interval, as in Heckman and Snyder (1997), we have 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 the legislator i votes for bill j, and 0 if she votes against, and e_{ij} is an error term. This equation differs from a conventional linear regression equation because of the interactive component, $\lambda_i F_j$: unobserved legislator ideology (λ_i) interacts with the unobserved direction and divisiveness of the bill (F_j).

Bai (2009) proposes an estimator for interactive fixed effects models of the form of Equation (3). We can therefore use Bai's estimation routine to estimate β and λ_i by least squares. This routine alternates between estimating β by regressing the outcome—rollcall votes—on the covariates $(f_{ij} - a_{ij})$, and estimating the bill and legislator components (F_j and λ_i) by applying principal components analysis to the residuals from that regression. The dependent variable residualizing out these bill and legislator components is then used to update the estimate of β and so forth until convergence. Bai shows this model is identified under standard assumptions normalizing the size and rotation of the factors and loadings. We use the implementation from Xu (2017) and Liu, Wang and Xu (2024) to estimate Equation (3).[6]

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

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

In order to study how lobbying affects legislator behavior, we need to compare this counterfactual measure netting out lobbying, to an observed measure of legislative ideology. We can use the estimated model parameters to develop such a measure on the same scale as λ_i. Given estimated α_j and F_j for bills $j = 1, ..., J$, we can estimate such a measure by solving the following least squares problem:

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

One can think of R_i as the model's estimate of i's ideal point, if the model assumed that i had not been lobbied on any bill. This measure incorporates whatever distorting effects lobbying has. For instance, if a given legislator i is compelled by lobbying to support right-wing legislation which i would otherwise not support, for that legislator it would estimate $R_i > \lambda_i$.

R_i and λ_i are measured on the same scale. If a legislator is never lobbied, then for that legislator $R_i = \lambda_i$. Differences between R_i and λ_i are only attributable to lobbying.

Because our focus is on how lobbying influences the relationship between district opinion and legislative behavior, we regress λ_i and R_i against a measure of issue-specific district opinion. Because R_i and λ_i are measured on the same scale, differences between those slopes are attributable to lobbying, even though voter and legislator ideology may not be measured on the same scale. In the observed data, with lobbying, legislator behavior is summarized by R_i. In a counterfactual scenario in which we shut down lobbying, legislator behavior would be λ_i.

Specifically, we run 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 leads legislators to behave as though they are more responsive to voters, removing lobbying would lead to patterns of legislative behavior less correlated with voter preferences. Alternatively, if $\varphi_1 < \varphi_2$, then lobbying distorts legislators away from their voters, and shutting down lobbying would strengthen representation. In Appendix B.1 we show that the under additional assumptions φ_2 corresponds to the weight that legislators place on their voters' preferences when deciding how to vote; if $\varphi_1 > \varphi_2$, lobbying thus leads to legislators behaving as though they place more weight on their constituents' preferences.

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]

This table reports estimates of β, 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 βs 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 4: Estimated effects of net lobbying on voting for a bill.

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 bills, and to legislators who vote on at least 10 bills on each issue. Table A38 gives the numbers of legislators and bills per legislator. For inference, we bootstrap the entire estimation routine, resampling states.

Table 4 shows the β coefficients. These coefficients measures the association between being lobbied by groups supporting or opposing a bill and the probability of a legislator voting for that bill, holding fixed average support for the bill and the the interaction between the legislator's latent ideology and the characteristics of the bill. While these coefficients are not our primary quantities of interest, they are informative about the form lobbying takes. If lobbying purely takes the form of subsidy—and does not persuade legislators—we would not observe a positive relationship between lobbying and legislative voting conditional on legislator ideology.

For the environment and healthcare, our estimates indicate lobbying does influence legislative voting, but the effects are small. On healthcare, for which we estimate the largest coefficient, a 10% increase in the number of groups lobbying a legislator for a bill corresponds to a 0.2 percentage point increase in the probability of that legislator voting for the bill.[7] The non-zero estimates are inconsistent with all lobbying taking the form of subsidy, but the very small magnitudes suggest that much of lobbying does take that form.

Figure 6 plots observed ideal points inclusive of lobbying minus counterfactual ideal points net of lobbying ($R_i - \lambda_i$) against district ideology.[8] A positive relationship there indicates a

[7] In Appendix D, we estimate a slightly larger coefficient for trade.

[8] Figure A22 plots both sets of ideal points against district ideology, across issues. These indicate a positive

stronger relationship between district ideology and ideal points the incorporate the effects of lobbying. Figure 6 shows that is the case for the environment; on other issues the relationship is flatter.

Table 5 presents regression estimates, with confidence intervals from bootstrapping the entire estimation procedure. In the aggregate, legislative ideal points inclusive of lobbying are more steeply related to district ideology than are ideal points net of lobbying; removing lobbying, this implies, would weaken the relationship between constituents and legislators. This relationship is driven by lobbying on environmental issues.

In Appendix B.2 we formally decompose this effect using the first order conditions of the estimator. For lobbying to move a given legislator right, lobbying needs to influence how legislators vote ($\beta > 0$), and that legislator must be on average lobbied in favor of bills which propose policies to the right of the status quo ($F_j > 0$).

In addition to influencing the slope, lobbying influences the level, though the estimates are small. Figure 6 suggests that lobbying pulls legislators on average right on the environment, but left on healthcare and immigration. Appendix B.2 decomposes this effect at the bill level. The leftward effect of lobbying on healthcare is due to lobbying in favor of the Children's Health Insurance Program Reauthorization Act of 2009 and against repealing Obamacare.[9]

In estimating these parameters (β and λ_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 latent ideology and features of the bill ($\lambda_i F_j$) and average support for the bill (α_j). Our estimation approach allows for lobbying activity to be correlated with legislator ideology, which is important given the evidence presented in the preceding sections that lobbying activity is correlated with both legislator and district ideology. The identification assumption is weaker than that required for two-way fixed effects. If $F_j = 1$ for all bills, Equation (3) is equivalent to two-way fixed effects; relative to two-way fixed effects our approach does not require that each bill divide legislators with differing ideologies in the same way. Xu (2017) shows how the use of interactive fixed effects relaxes the parallel trends assumption required for difference in differences.

The most plausible way the identification assumptions could be violated is if interest groups target legislators based not on the legislators' ideology, but on their idiosyncratic preferences for certain bills (the ε_{ij} term in Equation (2)). If interest groups supporting a bill target legislators who, for reasons unrelated to their ideology on the issue in question,

relationship between district ideology and both sets of ideal points for all issues except trade. Unsurprisingly, given the small estimates for β, the two sets of ideal points are very similar to one another.

[9] In Appendix E, when we include trade in the estimation, we find that lobbying leads to a leftwards shift in trade policy, an effect attributable to lobbying for the 2019 Export Finance Agency Act and the 2015 Export-Import Bank Reform and Reauthorization Act.

are more likely to support that bill, that would bias up our estimate of β. Alternatively, if interest groups supporting a bill target legislators who are less likely to support that bill, that would bias down our estimate of β.

While either form of endogeneity would alter our estimates of β, it would not alter our substantive conclusions about the effect of lobbying. In Figure A23, we replicate Figure 6, estimating λ_i and R_i while fixing β at half or twice our estimated values. Doing so results in almost exactly the same patterns, albeit with different magnitudes. The reason why changing the effectiveness of lobbying does not change our conclusions about how lobbying affects the relationship between voters and legislators is because that conclusion depends on the relationship between lobbying activity and district ideology, which is invariant to the size of β. If lobbying has no effect on rollcall votes, that would be consistent with legislative subsidy accounts of lobbying, under which lobbying leads to more effective representation on other margins. It is implausible that lobbying has a negative effect on rollcall voting. An interest group would not lobby a legislator if doing so made that legislator, in expectation, less likely to support bills supported by the group.

As an alternative estimation strategy, in Appendix B.3 we regress whether a legislator votes in the Republican direction on a bill against district ideology for the issue in question, with and without controlling for lobbying by groups supporting or opposing the Republican position on the bill. Controlling for lobbying attenuates the relationship between district preferences and rollcall voting, suggesting that the effect of lobbying is to bias up the relationship between the two (Table A7). This relationship holds with both OLS and logit estimators; the latter helps address concerns that Heckman-Snyder linear probability models of legislative ideology differ from probit or logit models such as Clinton, Jackman and Rivers (2004) and Nominate. That said, Appendix B.3 also shows that this regression-based method requires stronger assumptions about the relative positions of bills than the method used in this section.

PREDICTING ROLLCALL VOTES WITH DISTRICT PREFERENCES Thus far we have measured representation in terms of the slope of the relationship between district ideology and summaries of legislator rollcall votes. An alternative way to quantify representation is with the ability to successfully predict rollcall votes using district ideology. If legislators respond to district ideology then we should be able to predict a large share of rollcalls correctly.

Equation (3) gives a data generating process for rollcall votes. The probability of a legislator voting for a bill is a linear function of a bill fixed effect (α_j), the interaction of the legislator's ideal point and the relative positions of the status quo and proposal ($\lambda_i F_j$), and net lobbying $\beta(f_{ij} - a_{ij})$. We use the estimated parameters to simulate additional rollcalls,

Legislator ideal point:	Inclusive of lobbying (R_i)		Net of lobbying (λ_i)		Difference $(R_i - \lambda_i) \times 100$	
	(1)	(2)	(3)	(4)	(5)	(6)
District ideology	1.623*		1.622*		0.093*	
	[1.554; 1.736]		[1.552; 1.735]		[0.032; 0.148]	
× issue = Environment		1.805*		1.803*		0.231*
		[1.718; 1.932]		[1.715; 1.930]		[0.091; 0.395]
× issue = Healthcare		1.291*		1.291*		0.018
		[1.209; 1.417]		[1.209; 1.417]		[−0.050; 0.086]
× issue = Immigration		1.865*		1.864*		0.032
		[1.774; 2.016]		[1.775; 2.016]		[−0.034; 0.131]
FE: Issue-period	x	x	x	x	x	x
N	14302	14302	14302	14302	14302	14302
R^2	0.459	0.471	0.459	0.471	0.404	0.408

This 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 (λ_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 5: Lobbying aligns legislator behavior with voter preferences

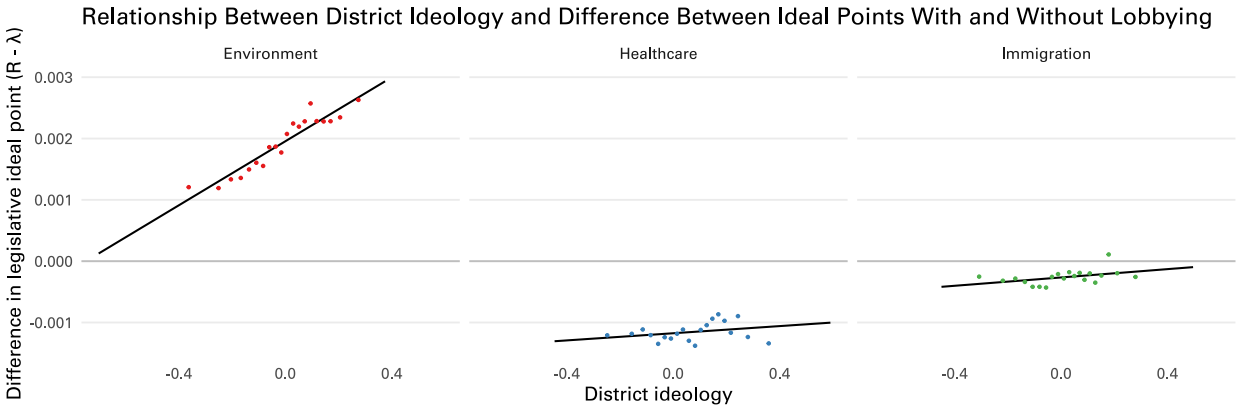

Figure 6: District Ideology and Difference in Legislator Ideal Point Due to Lobbying

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 CCES 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 rollcalls, 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.

with and without lobbying. Specifically, we run 1,000 simulations in which for each bill voted on we simulate how each legislator votes for it, with and without lobbying, given the following probabilities:

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

In these simulations, we use the observed pattern of lobbying across bills and the estimated bill and legislator parameters. We use the bill parameter F_j to flip the simulated rollcalls so that a vote for the bill indicates voting in the more conservative ideological direction. Finally, we run a logistic regression of simulated rollcalls on a given issue against district ideology on that issue, with period fixed effects. Our quantities of interest are the share of votes predicted correctly, averaging over these simulations, with and without lobbying. For inference, we bootstrap the entire estimation procedure, including the bill and legislator parameters, clustering by state.

Table 6 reports the results of this exercise. The logit with district ideology successfully predicts around three quarters of rollcalls generated with lobbying.[10] If we generate rollcalls setting lobbying to zero, the share predicted decreases. This difference is small—around 0.04 percentage points—but statistically significant. In a world where lobbying influences rollcall

[10]Note that we do not include fixed effects for each bill, so the logit will predict poorly on lopsided votes.

	% rollcalls classified correctly	95% CI
With lobbying	74.339	[70.498, 75.492]
Without lobbying	74.300	[70.451, 75.457]
Difference (x1000)	0.039	[0.008, 0.08]

This table reports the results of simulating rollcall votes from data generating processes including or excluding lobbying and then predicting these rollcalls using district ideology on the issue in question. The first row gives the percentage of rollcalls correctly predicted by a logit using district ideology, where rollcalls are generated in a data generating process that includes lobbying, as in Equation (3). The second row uses rollcalls 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 6: Rollcall votes from a data generating process including lobbying are slightly more easily predicted by district ideology

voting, rollcalls are better predicted by district ideology.

6 STUDYING THE RELATIONSHIP BETWEEN LOBBYING AND VOTING IN LINE WITH THE US CHAMBER OF COMMERCE

The previous analyses used patterns of rollcall voting to infer the ideological content of bills and thus examine the relationship between district and legislator ideology. A limitation of that approach is that, on the issue of trade, the resulting measures of legislative ideology are ambiguous. This section instead uses the positions of the US Chamber of Commerce to infer the content of bills. The overall conclusions from this approach are largely the same: lobbying on average strengthens the relationship between district preferences and legislative behavior, though trade is an exception to this pattern.

The relative strength of this approach depends on how well the positions of the Chamber of Commerce pick up the main left-right divide relevant to voters. Figure 7 plots the rates at which legislators vote in line with the Chamber of Commerce against district ideology. For the environment, healthcare, and trade, the two are positively correlated, though on immigration the relationship is inverse-u shaped. These correlations make sense given the economically rather than socially conservative positions of the Chamber of Commerce. These correlations suggest that Chamber of Commerce scores might be more useful for studying the effects of lobbying on representation with respect to trade, but less useful with respect to immigration.

Restricting to rollcall votes on which the Chamber of Commerce takes a stance involves using less data and less variation. The relationship between district preferences and rollcall

votes in Figure 7, even when positive, is noisier than that between district ideology and legislator ideal points in Figures 2 and A22. For trade, there are 6 rollcall votes for which we have both the position of the Chamber of Commerce and of district preferences in the corresponding period. Figure 7 shows that on average, even in the most protectionist districts, the overwhelming majority of rollcall votes correspond to the Chamber of Commerce's position.

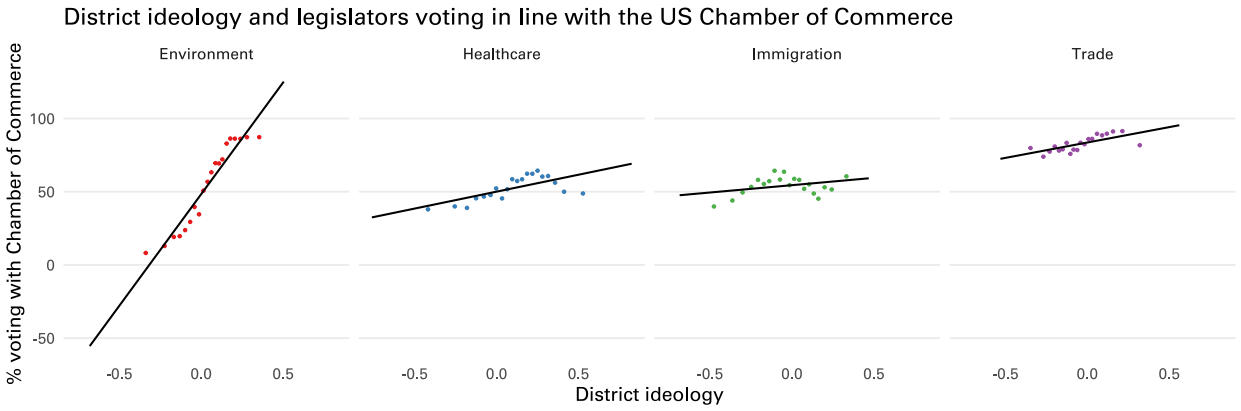

Figure 7: For the environment, healthcare, and trade, district ideology correlates with legislators voting in line with the US Chamber of Commerce

This figure plots the percentage of votes by legislators that correspond to the direction supported by the US Chamber of Commerce (y axis) against the IRT-MRP estimate of district ideology (x axis). Dots are binned averages, lines are OLS fits.

To investigate how lobbying influences the relationship between district preferences and voting with the Chamber of Commerce, we run two sets of regressions, as in Appendix B.3. In the first, we regress whether a legislator votes in line with the Chamber of Commerce against the district's ideology on the issue in question, with a fixed effect for the bill in question. In the second we also control for the log number of groups lobbying the legislator that support the Chamber of Commerce's position, minus the log number opposing it. The difference in coefficients on district ideology in these regressions gives a measure of how lobbying distorts the relationship between voters and legislators. If lobbying pushes legislators to vote in line with their constituents, the coefficient on district ideology without controlling for lobbying should be larger than that controlling for lobbying: lobbying is an omitted confounder that biases up the relationship between district preferences and rollcall voting.

Table 7 reports the results of this estimation strategy. The first two models pool all issues. As in Tables 5 and A7 lobbying slightly strengthens the slope of the relationship between district preferences and rollcall voting. This effect is small: the slope is under 1% steeper without controls for lobbying. The difference in slopes is however precisely estimated

and statistically significant. Models (3) and (4) drop votes related to immigration, given the ambiguous relationship between district preferences and voting with the Chamber of Commerce in Figure 7. Excluding immigration gives extremely similar estimates and patterns of statistical significance. Models (5) and (6) break this difference down by issue area, by allowing the slope on district ideology to vary by issue. For the environment and healthcare, lobbying strengthens the slope of the relationship between district ideology and rollcall votes.

Trade is a conspicuous exception to this pattern. The relationship between district ideology and rollcall voting is stronger when controlling for lobbying, suggesting that lobbying biases down that relationship. Figure 8 plots the raw data relating lobbying by groups supporting or opposing the Chamber of Commerce's position on different bills against district ideology. More protectionist districts are lobbied to a greater extent by interest groups siding with the Chamber of Commerce's position. More protectionist districts tend to be more conservative across the board, and their representatives tend to be lobbied by business interests who support free trade. In contrast, for the environment and immigration, more conservative districts tend to be lobbied by groups more aligned with the Chamber of Commerce.[11]

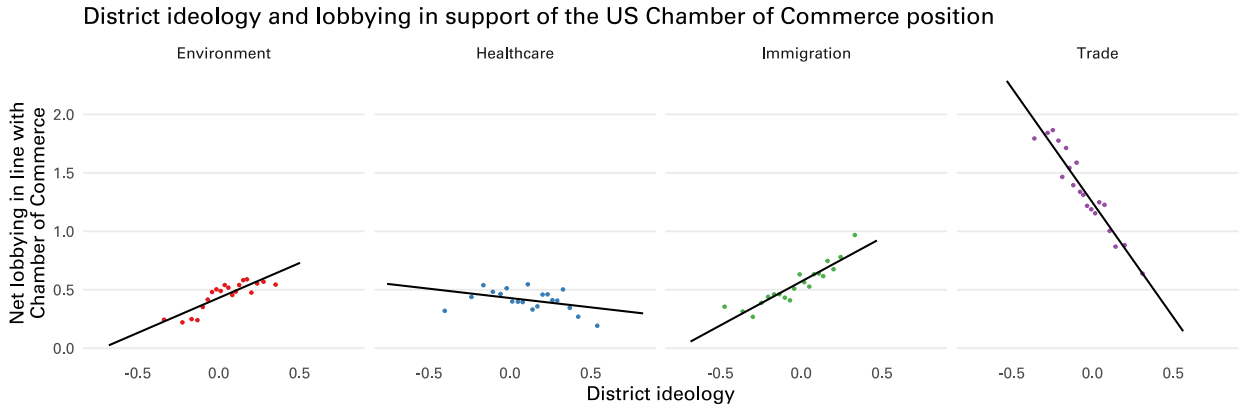

Figure 8: On trade and immigration, conservative districts are lobbied by groups sharing the Chamber of Commerce's preferences, on trade, protectionist districts tend to be lobbied by free trade interest groups

This figure plots the average log number of groups lobbying legislators that support the Chamber of Commerce's position on a bill, minus the log number of groups lobbying the legislator that oppose the Chamber of Commerce's position (y axis) against the IRT-MRP estimate of district ideology (x axis). Dots are binned averages, lines are OLS fits.

[11]Note that for healthcare, the discrepancy between Figure 8—which suggests no relationship between district ideology and being lobbied one way or the other—and Table 7, which indicates that lobbying strengthens the relationship between district ideology and rollcall votes, is attributable to the addition of bill fixed effects in the estimation in Table 7. There is variation over time in average district ideology and lobbying patterns that biases against finding a positive relationship between district ideology and lobbying in Figure 8.

	Vote in Chamber of Commerce direction								
	(1)	(2)	Diff. (×100)	(3)	(4)	Diff. (×100)	(5)	(6)	Diff. (×100)
District ideology	1.061*	1.053*	0.809*	1.195*	1.187*	0.8*			
	(0.026)	(0.026)	[0.346; 1.41]	(0.030)	(0.030)	[0.317; 1.392]			
× issue = Environment							1.612*	1.602*	0.98*
							(0.047)	(0.047)	[0.388; 1.659]
× issue = Healthcare							0.583*	0.578*	0.46*
							(0.029)	(0.029)	[0.073; 0.932]
× issue = Immigration							−0.056	−0.066	0.906*
							(0.046)	(0.046)	[0.338; 1.744]
× issue = Trade							0.410*	0.426*	−1.609*
							(0.063)	(0.060)	[−3.092; −0.43]
log net lobbying in Chamber of Commerce direction		0.034*			0.034*			0.030*	
		(0.007)			(0.008)			(0.007)	
Excluding immigration				x	x				
FE: Bill	x	x		x	x		x	x	
N	45449	45449		41465	41465		45449	45449	
R^2	0.398	0.400		0.432	0.434		0.448	0.449	

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 direction supported by the US Chamber of Commerce. The independent variable is district ideology, estimated by fitting an IRT model to survey data and adjusting with MRP. Models (2), (4), and (6) control for the log number of groups lobbying the legislator that support the Chamber of Commerce position on the bill, minus the log number lobbying that oppose the Chamber of Commerce position. Models (3) and (4) exclude votes related to immigration policy. Models (5) and (6) allow the coefficient on district ideology to vary by the issue in question. The columns between (2) and (3), (4) and (5) and after (6) 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. All models are estimated by OLS. Standard errors clustered by state in parentheses. For the differences, 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 7: Regression evidence of lobbying aligning legislator behavior with voter preferences, using the positions of the US Chamber of Commerce to infer right-wing rollcalls

7 CONCLUSION

Our findings challenge the widespread view that lobbying inherently undermines democratic representation. Rather than targeting legislators to move them away from their constituents' preferences, we show that interest groups often direct their efforts toward legislators whose district opinion already aligns with the group's policy goals. This pattern suggests that interest groups strategically engage in lobbying where they are most likely to reinforce, rather than redirect, legislative behavior. Moreover, our structural model of roll-call voting reveals that lobbying exerts a modest but consistent influence in the direction of constituency opinion. These findings indicate that, under many conditions, lobbying may function less as a distortionary force and more as a channel that amplifies existing representative linkages between voters and legislators.

We study legislative responsiveness in the context of roll-call voting on four issue areas. However, voting is only one dimension of responsiveness, and our analysis does not fully capture other facets of representative democracy. For instance, given the time constraints members of Congress face, the issues they choose to prioritize carry significant implications for representation. It is plausible that interest groups influence legislators' issue agendas by lobbying them, even when their positions on those issues align with voter preferences. In such cases, voters may care less about the issue, but lobbying efforts—through the provision of legislative subsidies and information—may lead legislators to devote more attention to it. Thus, while lobbying may not shift policy positions, it could still shape legislative behavior by distorting the prioritization of issues. Table A35 presents some evidence consistent with this concern: conditional on the extent a legislator is lobbied on a given issue, the extent of lobbying on other issues is associated with decreased legislative effectiveness on the issue in question, though these results are somewhat sensitive to the model specification. Another related concern is that lobbying could divert legislator effort away from issues voters care about. In Table A36 we analyze the relationship between how important voters say an issue is, and the extent to which their representatives are lobbied on that issue. A negative relationship would suggest that lobbying diverts legislators away from their constituents' priorities; instead we find no clear relationship between the two.[12]

To fully understand the implications of lobbying for legislative representation, an important next step is to examine how lobbying influences the composition of legislators' policy portfolios and the allocation of their time and resources across issues. This analysis should be paired with a comparison of these legislative priorities against the issue preferences and salience among

[12]This result comes with the caveat that survey measures of issue importance may be unreliable: we also do not find a clear correlation between constituent issue importance and legislators' effectiveness on a given issue (Table A37).

constituents. Such a comparison can reveal whether lobbying shifts legislators' focus toward the agendas of organized interests or whether it amplifies the concerns of their constituents, thereby providing a more comprehensive assessment of lobbying's impact on democratic responsiveness.

Another important direction for future research is to investigate the extent to which interest groups shape public opinion. In this paper, we treat the preferences of voters and interest groups as distinct and exogenous, without modeling how voters form issue-specific preferences, and isolate shifts in district ideology due to demographic change. However, interest groups may play a significant role in shaping public attitudes through advertising, public campaigns, and other forms of outside lobbying (Rasmussen, Mader and Rehere, 2018; Dür, 2019; Kalla and Porter, 2021). Incorporating the persuasive effects of interest group efforts on voter preferences would offer a deeper understanding of the dynamic interactions between voters and organized interests. It would also shed light on how these interactions feed back into legislative behavior, potentially amplifying or constraining the influence of interest group lobbying.

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Online Appendix for Lobbying and Legislative Representation

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A 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 A1 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 A2 and A3 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 A1 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 A4 shows that for all issues, above a certain size, the relationship between log Maplight lobbying instances and log non-Maplight lobbying instances 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 problematic 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 A5 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 A2 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 A6 plots group ideology estimated from Maplight against group ideology estimated from the Kim et al. (2025) data. The two are strongly positively correalted, 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 A1: 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 A2: Interest groups lobby on the bills they express public positions regarding

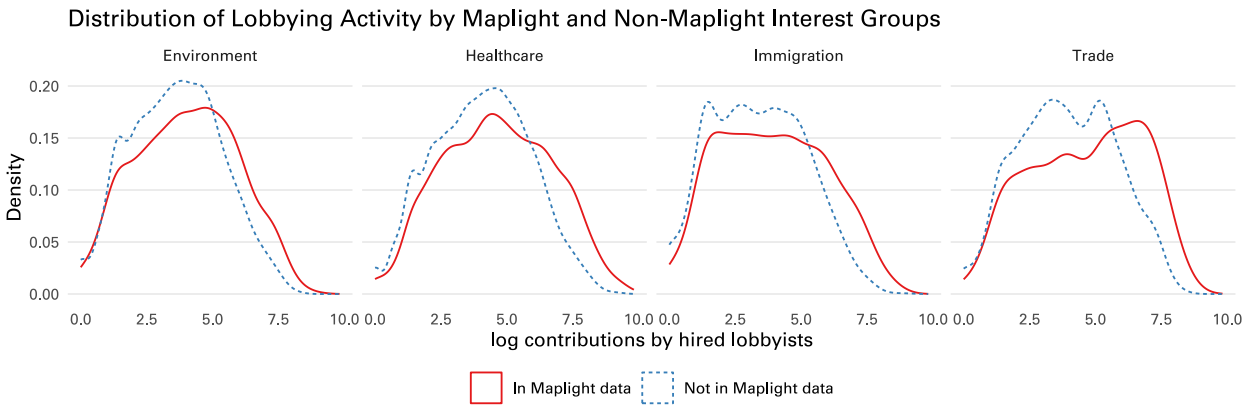

Figure A1: Interest Groups in the Maplight Data Are Larger and Lobby More Intensively

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.

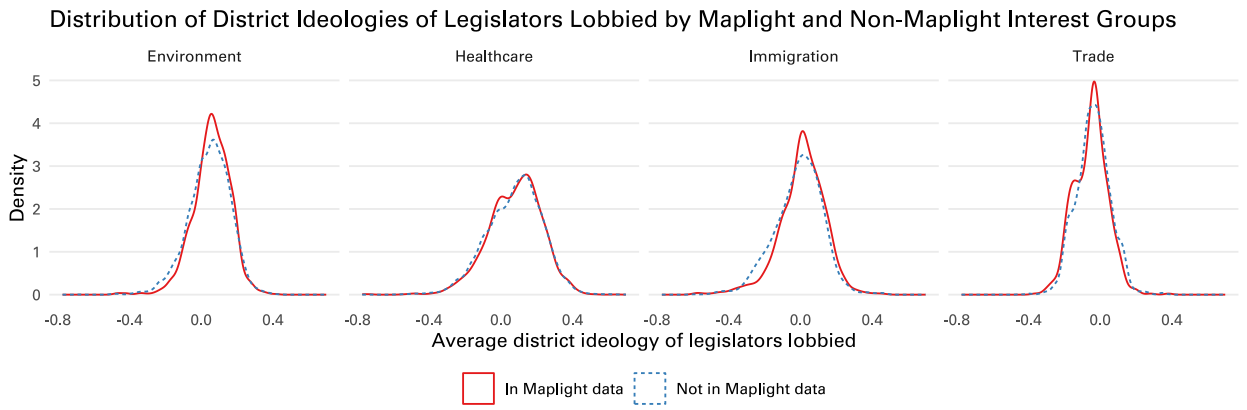

Figure A2: Interest Groups in the Maplight Data Lobby Legislators Representing Similar Districts to Those Not in the Maplight Data

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.

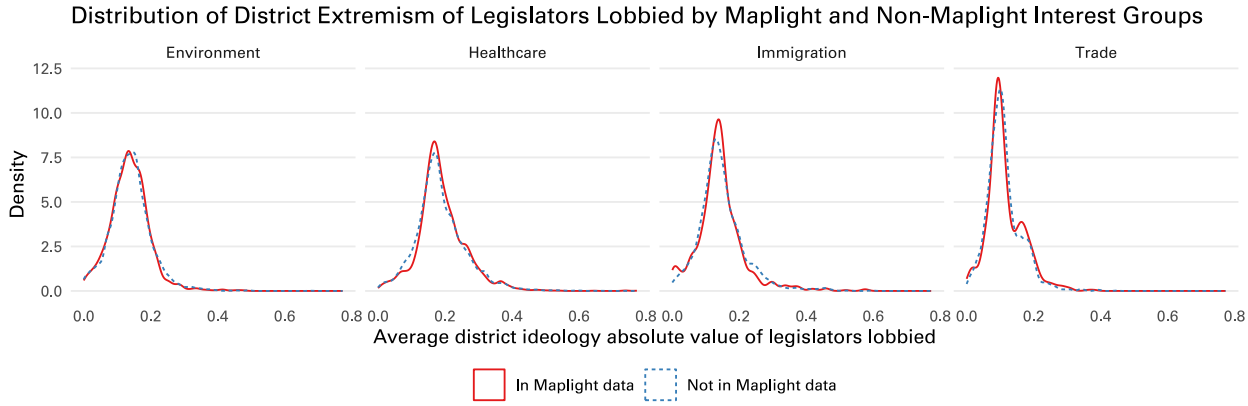

Figure A3: Interest Groups in the Maplight Data Lobby Legislators Representing Similarly Extreme Districts to Those Not in the Maplight Data

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.

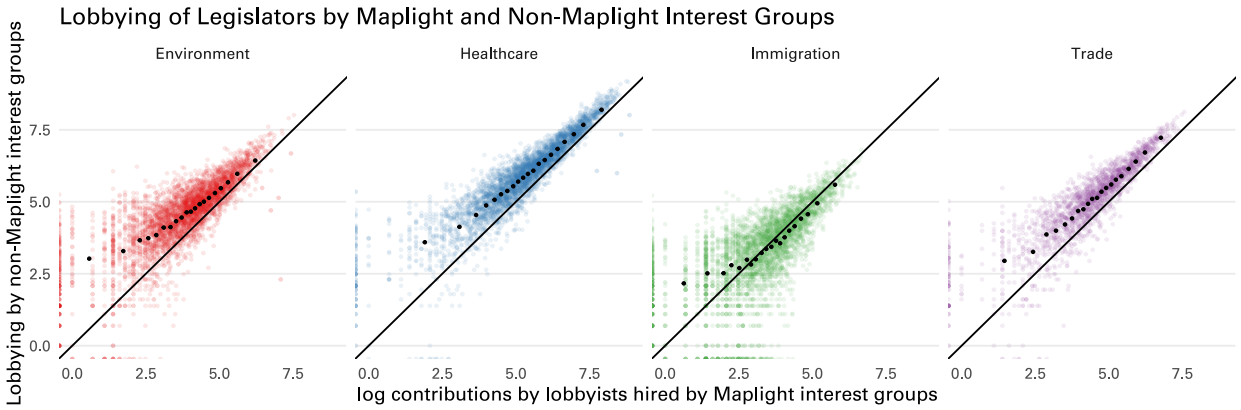

Figure A4: Legislators are lobbied similarly by interest groups in or not in the Maplight data

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.

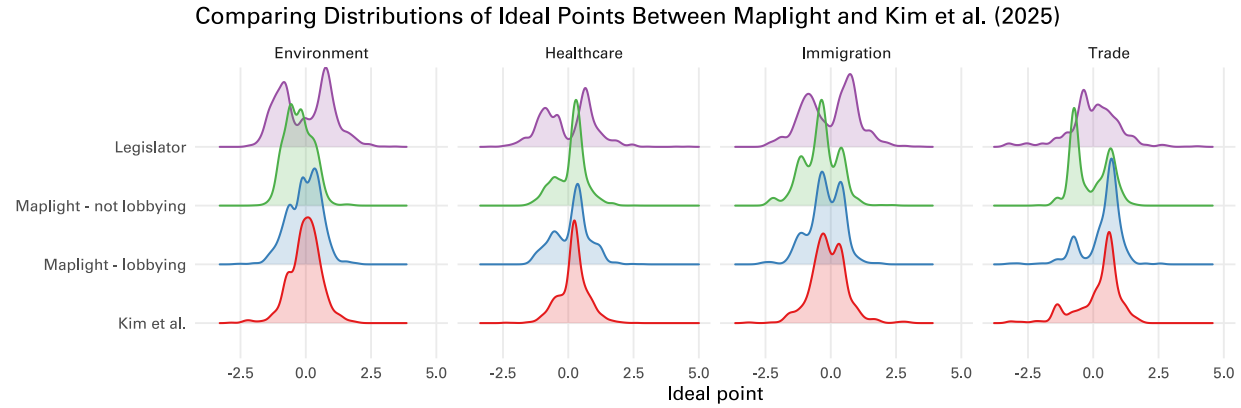

Figure A5: Ideal points estimated from Maplight data have similar distributions to those estimated from Kim et al. (2025) data

Data is at the interest group-issue level. We jointly estimate issue-specific ideal points using rollcalls, 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).

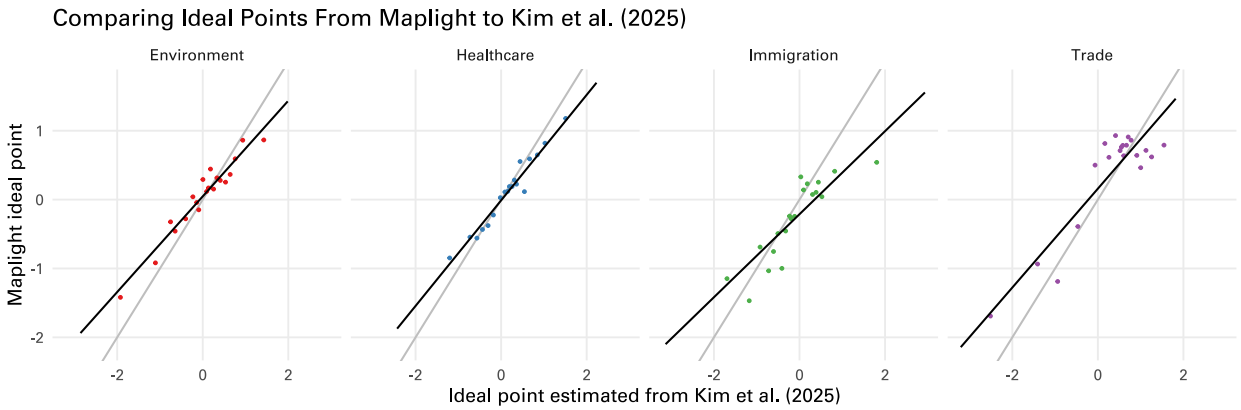

Figure A6: Ideal points estimated from Maplight data strongly correlate with those estimated from Kim et al. (2025) data

Data is at the interest group-issue level. We jointly estimate issue-specific ideal points using rollcalls, 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.

B MODEL EXTENSIONS AND ADDITIONAL ESTIMATES

B.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,

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

can be derived from an extended version of the model in which legislators make tradeoffs between their constituents' preferences and their own idiosyncratic preferences.

Legislator i has private ideal point ξ_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 her own preferences relative to the average utility of her constituents, $\frac{1}{N_i}\sum_{k=1}^{N_i} u^p_{kij}$. 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 ξ_i is uncorrelated with v_i, $\mathbb{E}[(\xi_i - \bar{\xi})v_i] = 0$, a regression of λ_i on v_i estimates γ. This assumption is reasonable if one thinks of ξ_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 (λ_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 λ_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 λ_i against *District ideology*$_i$, the δ component would be the same across specifications; the only difference would be in γ, the weight that legislators appear to place on voter welfare.

B.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 λ_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 λ_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 $(y_{ij} - \beta\left(f_{ij} - a_{ij}\right) - \alpha_j)$ is positively correlated with the direction of the bill (F_j), then i's

ideology (λ_i) is more positive. Applying the same derivation to the estimation of R_i, which uses the estimated values of F_j and α_j from estimating λ_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 λ_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 A3–A6 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 A3: 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 A4: 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 A5: 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 A6: 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

B.3 *Regression-Based Estimates*

As an alternative, less parametric way to study how lobbying affects the alignment between voters and legislators, we can regress rollcall 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, 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, α_j and α'_j are bill fixed effects, and ε_{ij} is the error term. θ is then a measure of the relationship between district ideology and legislative voting, net of the effects of being lobbied. θ' 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 A7 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 A8 shows this result is robust to including rollcall votes and lobbying on trade.

Note however that this estimation strategy requires stronger and less plausible assumptions about rollcall voting than the main estimation strategy in Section 5. Take the model from Section 5. Suppose that legislators' ideal points λ_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 B.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 A18–A21 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 β, 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 (ξ_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*	0.209*	9.374*	9.362*	1.202*
	(0.027)	(0.027)	[0.122; 0.294]	(0.398)	(0.398)	[0.198; 2.117]
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	165657	165657		165657	165657	
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 A7: Regression evidence of lobbying aligning legislator behavior with voter preferences

	Vote in R direction					
	(1)	(2)	Difference (x100)	(3)	(4)	Difference (x100)
District ideology	0.857*	0.855*	0.203*	8.878*	8.866*	1.223*
	(0.026)	(0.026)	[0.117; 0.287]	(0.367)	(0.366)	[0.199; 2.117]
log net lobbying in R direction		0.043*			0.256*	
		(0.006)			(0.042)	
Estimator	OLS	OLS		Logit	Logit	
FE: Bill	x	x		x	x	
N	172299	172299		172299	172299	
R^2	0.482	0.483				
Pseudo-R^2				0.511	0.512	

This table reproduces Table A7, 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 A8: Regression evidence of lobbying aligning legislator behavior with voter preferences, including trade

legislators who share their preferences for reasons other than district ideology, this estimation strategy would estimate a positive β coefficient. Consistent with that account, the coefficient on lobbying in Table A7 model (2) is larger than those in Table 4.

C IDEAL POINT ESTIMATION PARAMETERS

C.1 *Survey questions*

Table A11: CCES survey questions used to estimate healthcare including abortion ideal points, and discrimination parameters

Issue	Years asked	Respondents	β
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 CCES questions used to estimate healthcare including abortion ideal points.

Table A9: CCES survey questions used to estimate environment ideal points, and discrimination parameters

Issue	Years asked	Respondents	β
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 CCES questions used to estimate environment ideal points. β 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 A10: CCES survey questions used to estimate healthcare ideal points, and discrimination parameters

Issue	Years asked	Respondents	β
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 CCES questions used to estimate healthcare ideal points. β 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 A12: CCES survey questions used to estimate immigration ideal points, and discrimination parameters

Issue	Years asked	Respondents	β
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 CCES questions used to estimate immigration ideal points. β 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 A13: CCES survey questions used to estimate trade ideal points, and discrimination parameters

Issue	Years asked	Respondents	β
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 CCES questions used to estimate trade ideal points. β 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 A14: 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 A15: 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 A16: 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 A17: 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

Table A18: Parameters of bills used to estimate legislator and interest group environment ideal points, 10 least and most Republican

Code	Bill	α	β
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 A19: Parameters of bills used to estimate legislator and interest group healthcare ideal points, 10 least and most Republican

Code	Bill	α	β
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 A20: Parameters of bills used to estimate legislator and interest group immigration ideal points, 10 least and most Republican

Code	Bill	α	β
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 A21: Parameters of bills used to estimate legislator and interest group trade ideal points, 10 least and most Republican

Code	Bill	α	β
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

D 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 CCES asks voters about support for the TPP, which is one of the questions used to estimate trade ideal points. Figure A7 plots the Senate's rollcalls 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 A8 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."[13] We would therefore expect the legislators rated as sharing Public Citizen's preferences on trade to be more protectionist. Figure A9 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 A21).

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 rollcalls, 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 A10 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 Chamber of Commerce, though given the sparseness of the data some of these relationships are noisy. Figure A11 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

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

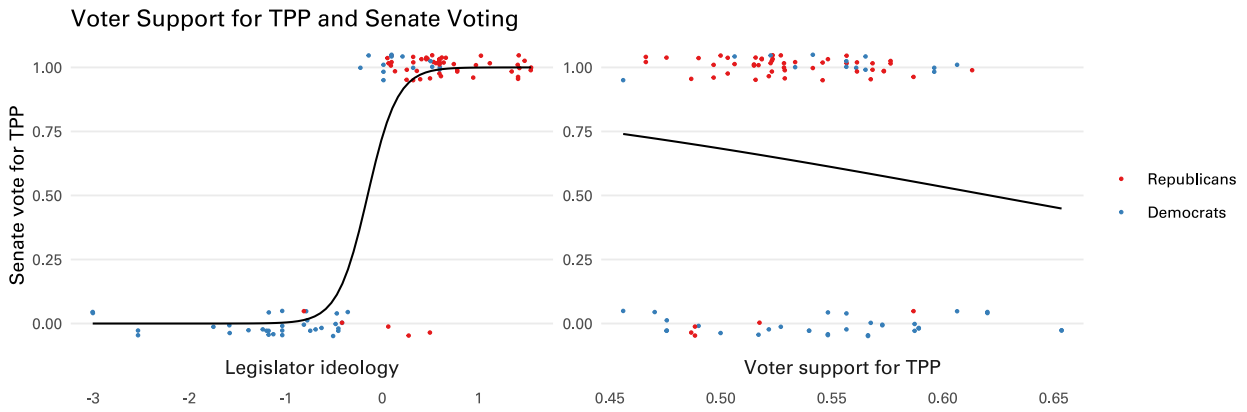

Figure A7: Senate voting on TPP correlates strongly with legislator ideology, but not with voter support for TPP

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 CCES. Each dot corresponds to a senator, points are jittered to increase legibility. Black lines are logit fits.

to CCES 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 A21, 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 A13 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—as in Figure 3—that pro-trade interest groups tend to lobby legislators with pro-trade constituents.

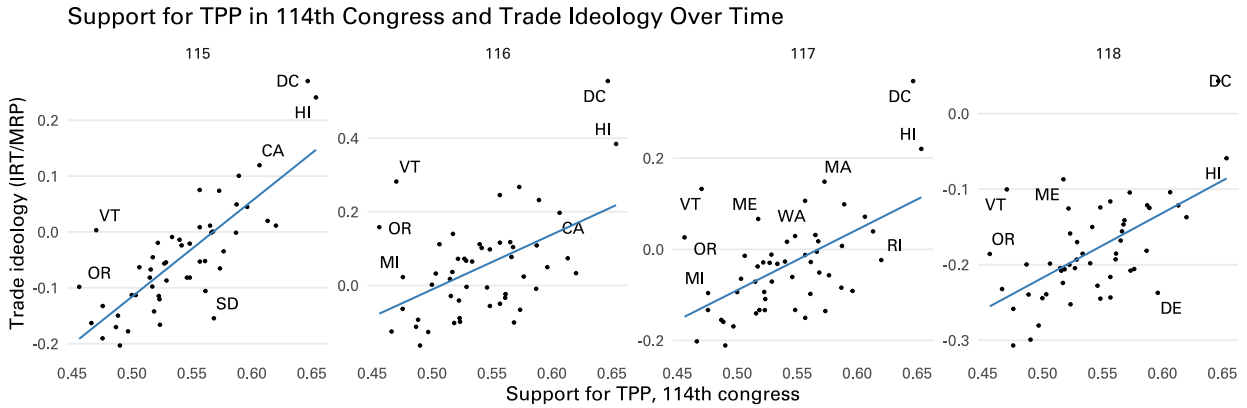

Figure A8: Voter support for TPP in 114th congress correlates strongly with subsequent trade ideology

This figure plots average trade ideology among voters by state, estimated by fitting an IRT model to CCES 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.

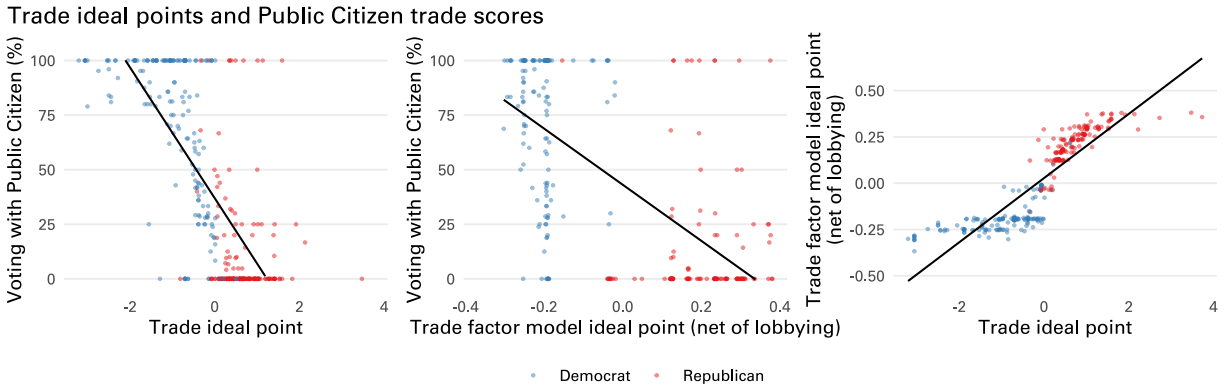

Figure A9: Trade ideal points are negatively correlated with Public Citizen's "commitment to fair trade and the public interest" scores of legislators

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.

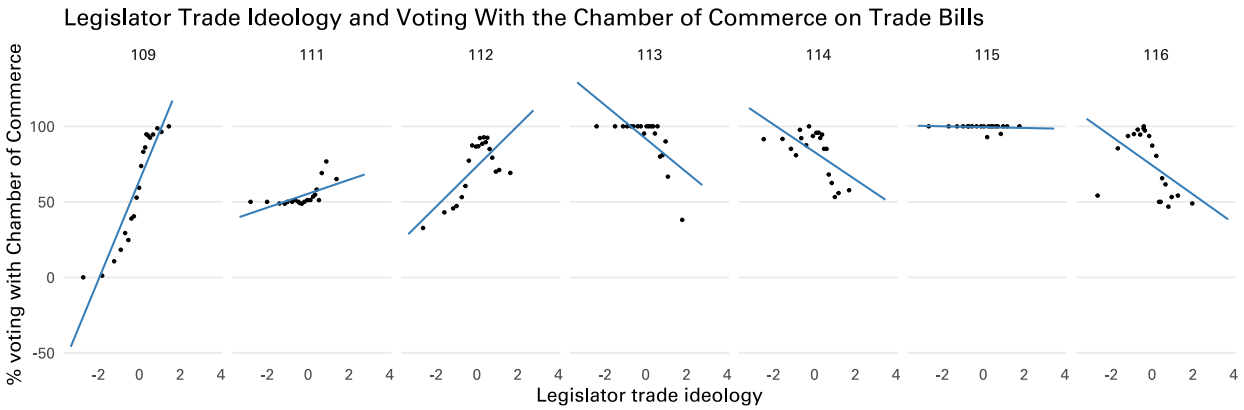

Figure A10: The relationship between legislator ideal points on trade and voting with the Chamber of Commerce flips over time

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.

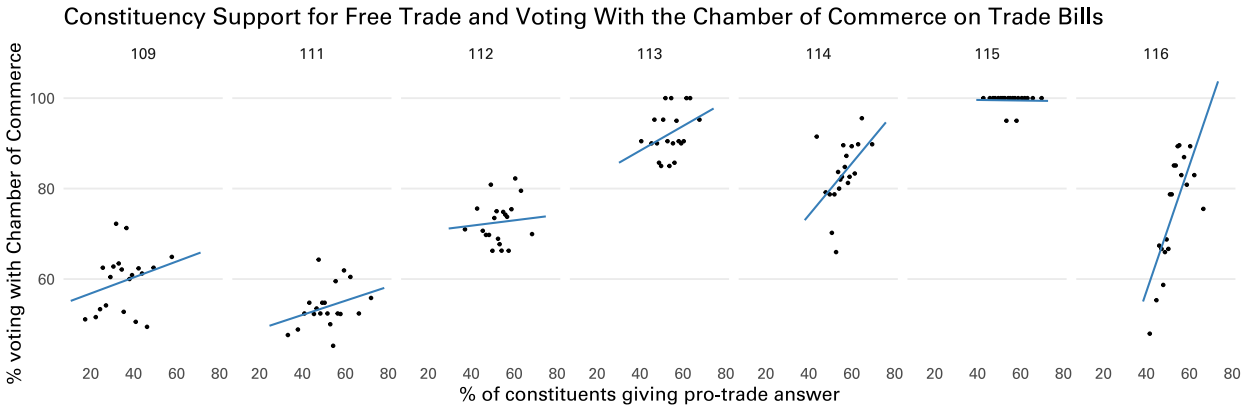

Figure A11: District support for free trade consistently correlates with legislators voting with the Chamber of Commerce on trade bills, but the relationship strengthens in recent congresses

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.

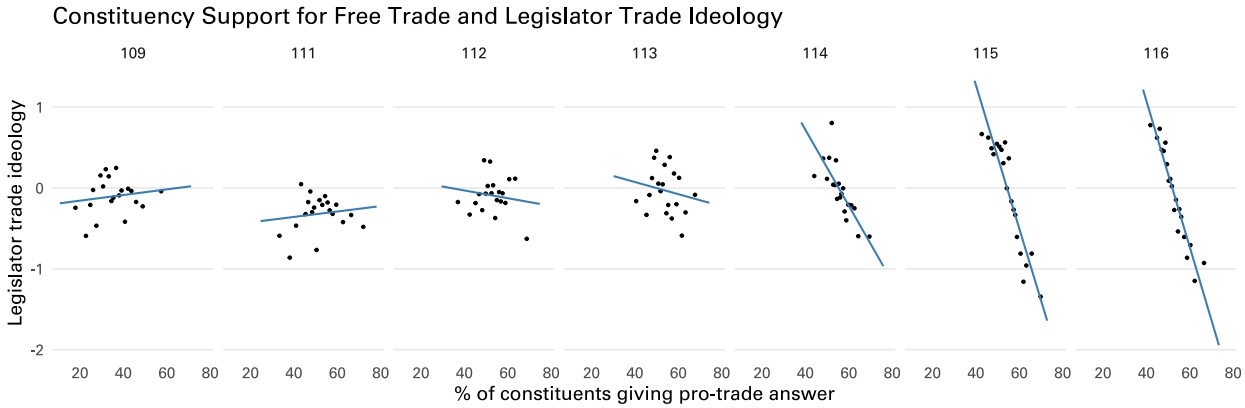

Figure A12: The relationship between district support for free trade and legislator ideology on trade flips over time

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.

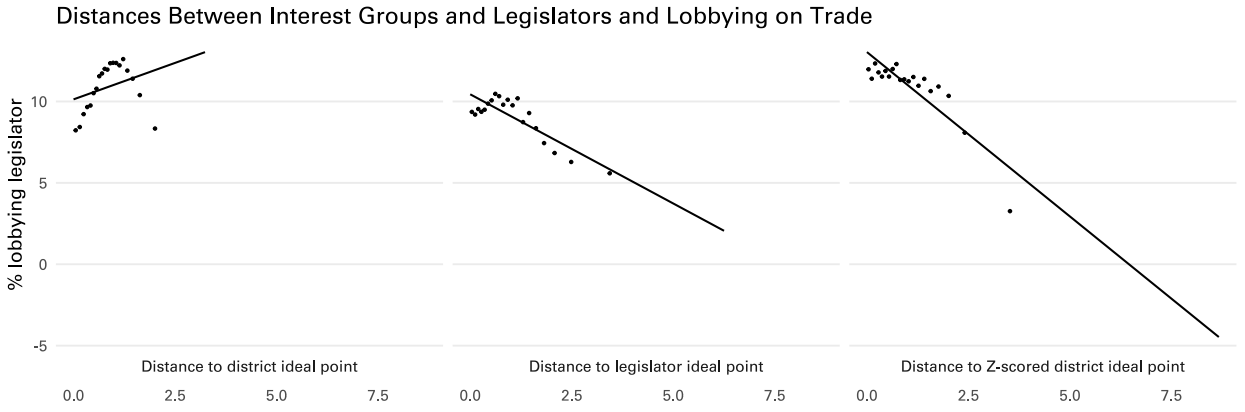

Figure A13: Interest groups do lobby legislators on trade with aligned constituencies

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.

E ROBUSTNESS OF RESULTS TO INCLUDING TRADE

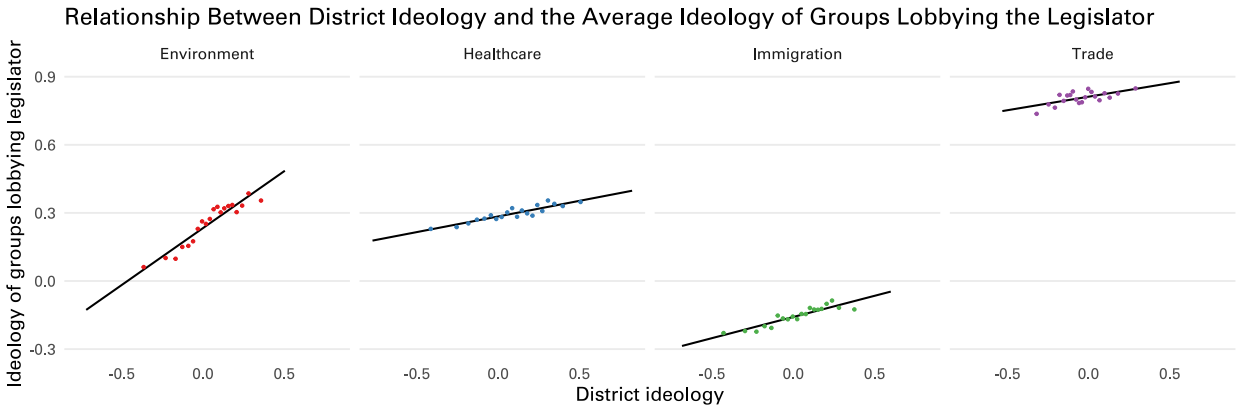

Figure A14: Representatives of more liberal districts tend to be lobbied by more liberal interest groups, including trade

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 CCES survey data; interest group ideology is estimated by running an IRT model on stances on rollcall 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 CCES data. Odd-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 A22: Changes to district ideology due to demographics correlate with changes in the ideology of groups lobbying the representative, including trade

	log contributions from lobbyists					
	(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 groups lobbying		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 3, adding trade as an issue area. This table presents evidence of the relationship between issue-specific district ideology and the ideology of groups lobbying a legislator. Data is 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 a lobbyist hired to lobby in multiple instances multiple times. The main independent variable is the absolute value of the district's ideology on that issue in that period. Models (2), (4), and (6) control for the predicted number of groups lobbying the legislator based on ideological distance from the district to interest groups lobbying. All models include issue-congress fixed effects, (3)–(4) include issue-district fixed effects, (5)–(6) includes issue-legislator fixed effects. Standard errors clustered by state in parentheses. $^{*}p < 0.05$; $^{\dagger}p < 0.1$.

Table A23: 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 4, adding trade as an issue area. The table reports estimates of β, 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 βs 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 A24: Estimated effects of net lobbying on voting for a bill, including trade

Legislator ideal point:	Inclusive of lobbying (R_i)		Net of lobbying (λ_i)		Difference $(R_i - \lambda_i) \times 100$	
	(1)	(2)	(3)	(4)	(5)	(6)
District ideology	1.426*		1.425*		0.090*	
	[1.368; 1.538]		[1.368; 1.537]		[0.031; 0.141]	
× issue = Environment		1.805*		1.803*		0.231*
		[1.718; 1.932]		[1.715; 1.930]		[0.091; 0.395]
× issue = Healthcare		1.291*		1.291*		0.018
		[1.209; 1.417]		[1.209; 1.417]		[−0.050; 0.086]
× issue = Immigration		1.865*		1.864*		0.032
		[1.774; 2.016]		[1.775; 2.016]		[−0.034; 0.131]
× 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	15775	15775	15775	15775	15775	15775
R^2	0.370	0.466	0.370	0.466	0.380	0.383

This table reproduces Table 5 including rollcall 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 (λ_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 A25: Lobbying aligns legislator behavior with voter preferences, including trade

	% rollcalls classified correctly	95% CI
With lobbying	74.396	[70.547, 75.569]
Without lobbying	74.345	[70.499, 75.529]
Difference (x1000)	0.052	[0.019, 0.094]

This table reproduces Table 6, adding trade as an issue area. The table reports the results of simulating rollcall votes from data generating processes including or excluding lobbying and then predicting these rollcalls using district ideology on the issue in question. The first row gives the percentage of rollcalls correctly predicted by a logit using district ideology, where rollcalls are generated in a data generating process that includes lobbying, as in Equation (3). The second row uses rollcalls 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 A26: Rollcall votes from a data generating process including lobbying are slightly more easily predicted by district ideology, including trade

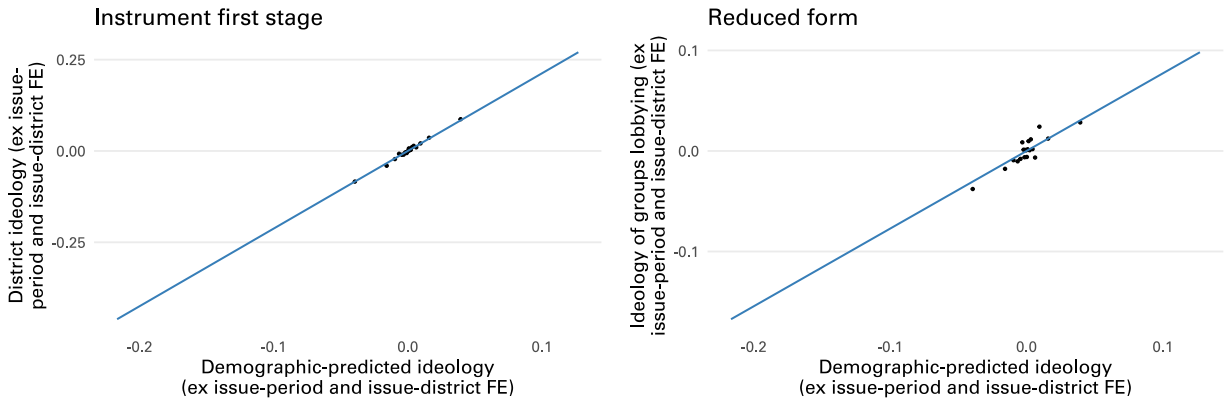

Figure A15: First stage and reduced form for instrumental variables estimation, including trade

This figure reproduces Figure 4, 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 A22 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.

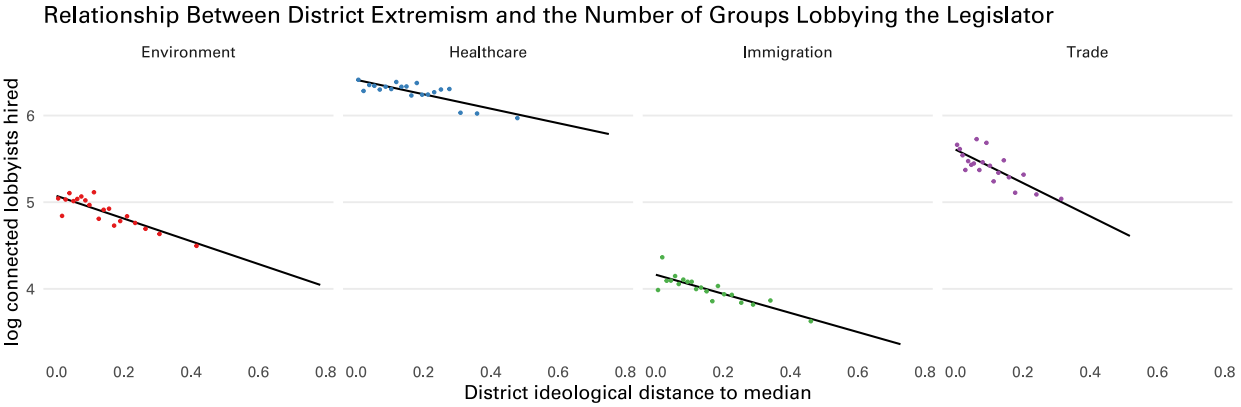

Figure A16: Representatives of more centrist districts tend to be lobbied more, adding trade

This figure reproduces Figure 5, 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 CCES 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.

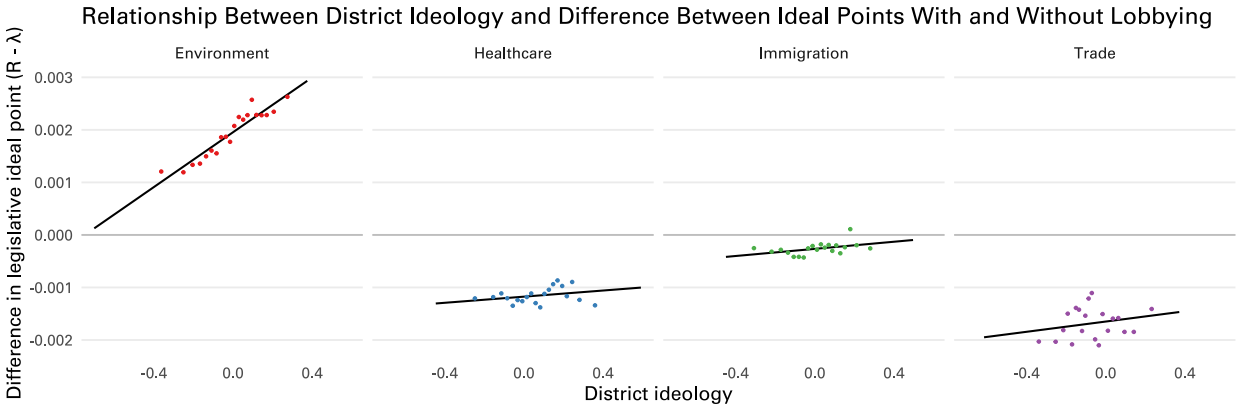

Figure A17: District Ideology and Difference in Legislator Ideal Point Due to Lobbying, Adding Trade

This figure reproduces Figure 6, 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 CCES 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 rollcalls, 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.

	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 rollcall votes, the independent variable is the district's ideology, as estimated by MRP from CCES 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 A27: Issue-specific legislator ideology correlates with district ideology

F ADDITIONAL TABLES

	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 A28: 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 A29: 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 A30: Interest group-level cumulative mean and median connections to lobbyists and legislators

	log legislative effectiveness					
	(1)	(2)	(3)	(4)	(5)	(6)
log lobbying contributions	0.069*	0.048*	0.041*	0.080*	0.065*	0.058*
	(0.006)	(0.007)	(0.007)	(0.016)	(0.005)	(0.013)
Including trade					x	x
FE: Issue x congress	x	x			x	
- Issue x legislator		x	x	x		x
- Issue x congress x party			x	x		x
- Congress x legislator				x		x
N	11540	11540	11540	11540	15755	15755
R^2	0.029	0.499	0.517	0.705	0.031	0.637

This table presents evidence of the relationship between lobbying and legislative effectiveness. Data is 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 contributions made to the legislator by lobbyists hired to lobby on the issue in question. Models (1)–(2) and (5) include issue-by-congress fixed effects, (2)–(4) and (6) add issue-by-legislator fixed effects, (3)–(4) and (6) issue-by-congress-by-party fixed effects, which account for party-congress changes in effectiveness, (4) and (6) include legislator-congress fixed effects. Models (5) and (6) add the trade issue. Standard errors clustered by legislator in parentheses. $^{*}p < 0.05$; $^{\dagger}p < 0.1$.

Table A31: Legislators who are lobbied on an issue are more effective on it

	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 A32: Interest groups lobby legislators whose constituents agree with them

	Average ideology of districts lobbied			
	(1)	(2)	(3)	(4)
Interest group ideology				
× district issue = Environment	0.040*	0.041*	−0.016	−0.024
	(0.005)	(0.012)	(0.020)	(0.020)
× district issue = Healthcare	0.043*	0.035*	0.029	0.020†
	(0.011)	(0.005)	(0.018)	(0.011)
× district issue = Immigration	0.021	0.053*	0.047*	−0.058†
	(0.027)	(0.012)	(0.011)	(0.032)
× district issue = Trade	−0.009†	0.002	0.010	0.004
	(0.005)	(0.007)	(0.025)	(0.005)
Interest group ideology issue	Environment	Healthcare	Immigration	Trade
FE: District issue x period	x	x	x	x
N	1975	3762	1256	1166
R^2	0.404	0.456	0.354	0.505

This table presents evidence of the relationship between an interest group's ideology on one issue, and the ideology of the districts whose representatives it lobbies on each issue. Data is at the interest group-by-district issue-by-period level. The dependent variable is the average issue-specific ideology of districts lobbied by an interest group on a given issue. The independent variable is the ideology of the interest group, which we interact with the the issue on which we measure district ideology. Each column subsets to a different interest group ideology issue. The first row of the first column shows the relationship between interest group ideology on the environment, and the environment ideology of districts it lobbies on the environment, the second row shows the relationship between interest group ideology on the environment, and the healthcare ideology for districts it lobbies on healthcare, the third the equivalent for immigration, and the fourth the equivalent for trade. All models include fixed effects for the district issue-by-period. Standard errors clustered by interest group in parentheses. $^{*}p < 0.05$; $^{\dagger}p < 0.1$.

Table A33: Relationship between interest group ideology on one issue and the ideology of districts lobbied on other issues

	Average ideology of legislators lobbied			
	(1)	(2)	(3)	(4)
Interest group ideology				
× legislator issue = Environment	0.357*	0.399*	0.113	−0.110
	(0.036)	(0.084)	(0.144)	(0.174)
× legislator issue = Healthcare	0.346*	0.253*	0.353*	0.078
	(0.073)	(0.029)	(0.117)	(0.083)
× legislator issue = Immigration	0.202	0.512*	0.332*	−0.355†
	(0.140)	(0.059)	(0.081)	(0.185)
× legislator issue = Trade	0.171*	0.066	−0.053	0.138*
	(0.057)	(0.081)	(0.142)	(0.057)
Interest group ideology issue	Environment	Healthcare	Immigration	Trade
FE: Legislator issue x period	x	x	x	x
N	1975	3762	1255	1166
R^2	0.157	0.133	0.107	0.071

This table presents evidence of the relationship between an interest group's ideology on one issue, and the ideology of the legislators it lobbies on each issue. Data is at the interest group-by-legislator issue-by-period level, subset to a given interest group issue. The dependent variable is the average issue-specific ideology of legislators lobbied by an interest group on a given issue. The independent variable is the ideology of the interest group, which we interact with the the issue on which we measure legislator ideology. Each column subsets to a different interest group ideology issue. The first row of the first column shows the relationship between interest group ideology on the environment, and the environment ideology of legislators it lobbies on the environment, the second row shows the relationship between interest group ideology on the environment, and the healthcare ideology for legislators it lobbies on healthcare, the third the equivalent for immigration, and the fourth the equivalent for trade. All models include fixed effects for the legislator issue-by-period. Standard errors clustered by interest group in parentheses. $^{*}p < 0.05$; $^{\dagger}p < 0.1$.

Table A34: Relationship between interest group ideology on one issue and the ideology of legislators lobbied on other issues

	log issue-specific legislative effectiveness					
	(1)	(2)	(3)	(4)	(5)	(6)
log lobbying contributions on other issues	0.037*	−0.123*	0.034*	−0.023†	0.034*	−0.014
	(0.007)	(0.013)	(0.009)	(0.013)	(0.008)	(0.012)
log lobbying contributions on issue		0.181*		0.066*		0.056*
		(0.013)		(0.012)		(0.010)
Including trade					x	x
FE: Issue x congress	x	x	x	x	x	x
- Issue x legislator			x	x	x	x
N	11113	11113	11113	11113	15147	15147
R^2	0.014	0.046	0.500	0.502	0.476	0.477

This table presents evidence of the relationship between being lobbied on other issues, and issue-specific legislative effectiveness. Data is 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 contributions made to the legislator by lobbyists hired to lobby on issues other than the one in question, for healthcare, immigration, energy and environment, and trade. Models (1)–(4) exclude legislative effectiveness on trade, (5) and (6) include it. All models include issue-by-congress fixed effects, (3)–(6) add issue-by-legislator fixed effects. (2), (4), and (6) control for the log number of contributions by legislators hired to lobby on the issue in question. Standard errors clustered by legislator in parentheses. $^*p < 0.05$; $^\dagger p < 0.1$.

Table A35: Controlling for issue-specific lobbying, being lobbied on other issues is associated with somewhat lower legislative effectiveness

	log contributions from lobbyists					
	(1)	(2)	(3)	(4)	(5)	(6)
Issue importance	$-0.214^{\dagger}$	0.056				
	(0.119)	(0.075)				
Demographic-predicted issue importance			-0.551^{*}	-0.037	0.066	-1.292
			(0.219)	(0.181)	(0.471)	(1.135)
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	12586	12586	12586	12586
R^2	0.319	0.918	0.387	0.921	0.607	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 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 CCES, 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 A36: 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			−0.402*	−0.388*	−0.104	−0.963
			(0.135)	(0.143)	(0.194)	(0.738)
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	13118	13118	13118	13118
R^2	0.010	0.324	0.010	0.409	0.265	0.509

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 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 CCES, 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 A37: Issue-specific legislative effectiveness is unrelated to voters' expressed issue importance

Table A38: Number of legislators and bills used to estimate ideal points with and without lobbying

Issue	Legislators	Average rollcall votes per legislator
Environment	1040	63.12
Healthcare	1151	86.54
Immigration	731	24.66
Trade	332	14.48

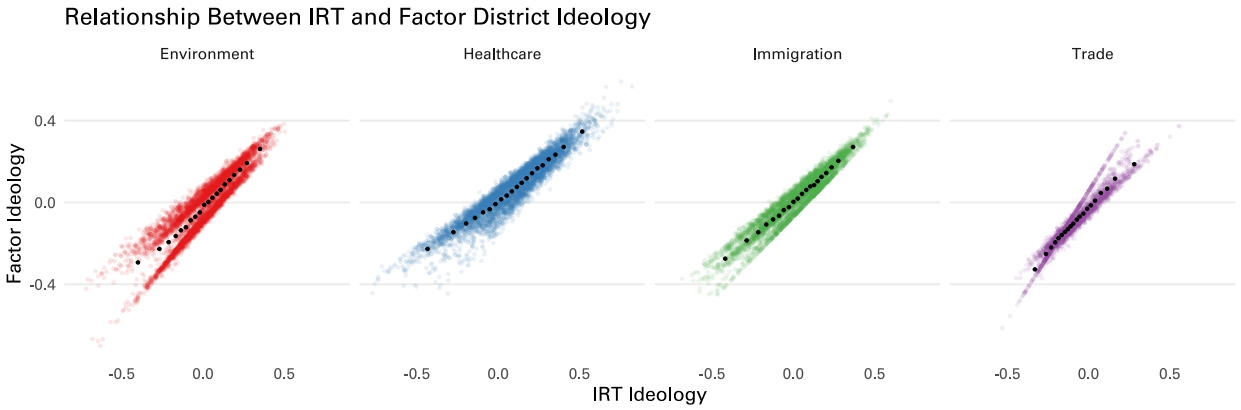

Figure A18: Comparison of District Ideology Estimates Using IRT and Factor Models

This figure compares estimates of district ideology from running an IRT model on CCES 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.

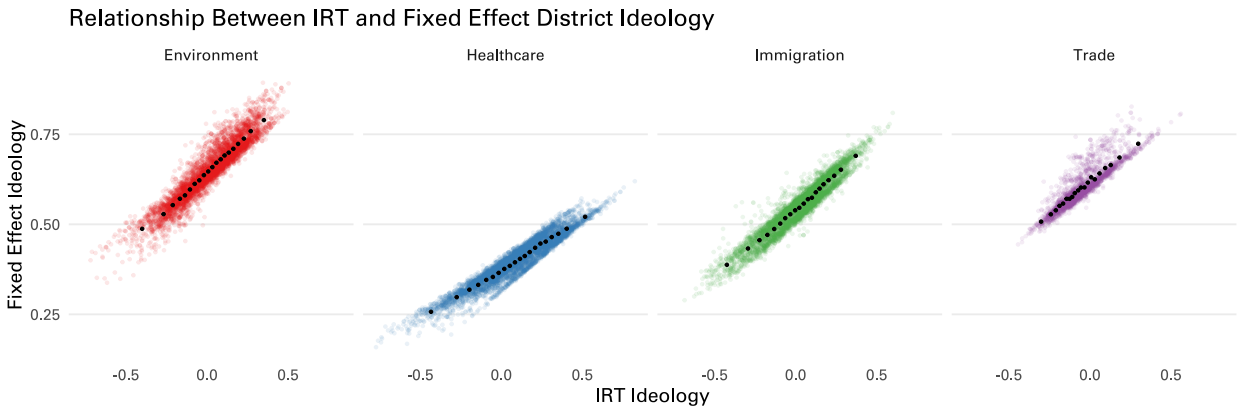

Figure A19: Comparison of District Ideology Estimates Using IRT and Fixed Effects Models

This figure compares estimates of district ideology from running an IRT model on CCES 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.

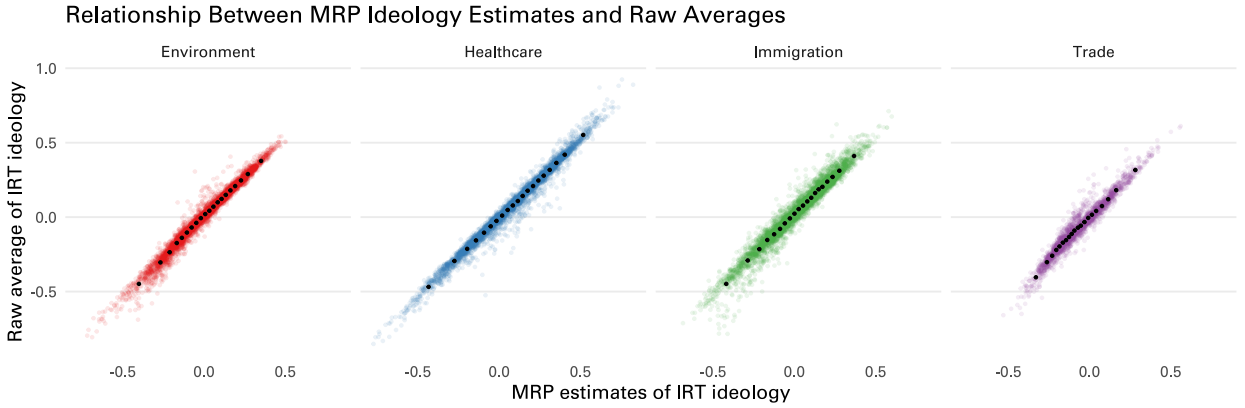

Figure A20: Comparison of District Ideology Estimates Using Multilevel Regression and Poststratification against Raw Averages

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

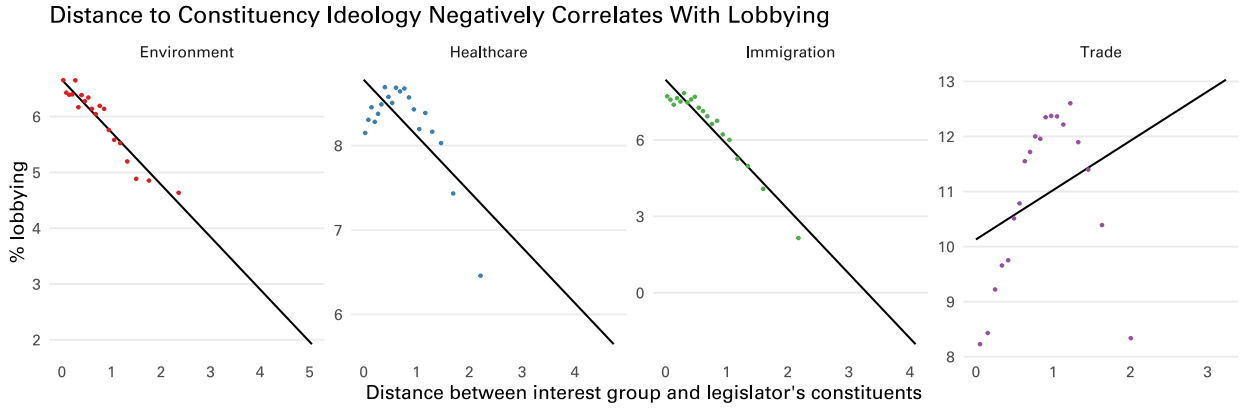

Figure A21: Interest groups lobby legislators with ideologically close constituents

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 CCES 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.

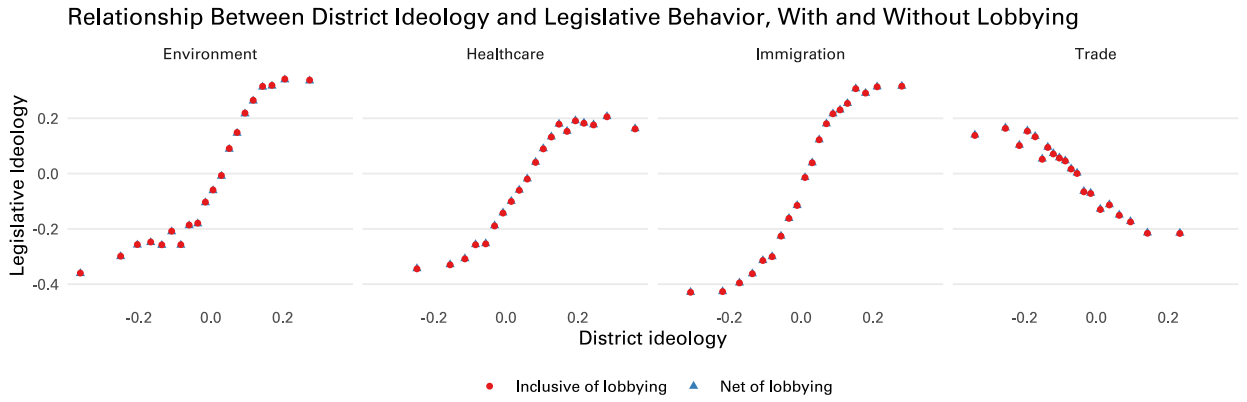

Figure A22: District Ideology and Legislator Preferences, With and Without Lobbying

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 CCES 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 (λ_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.

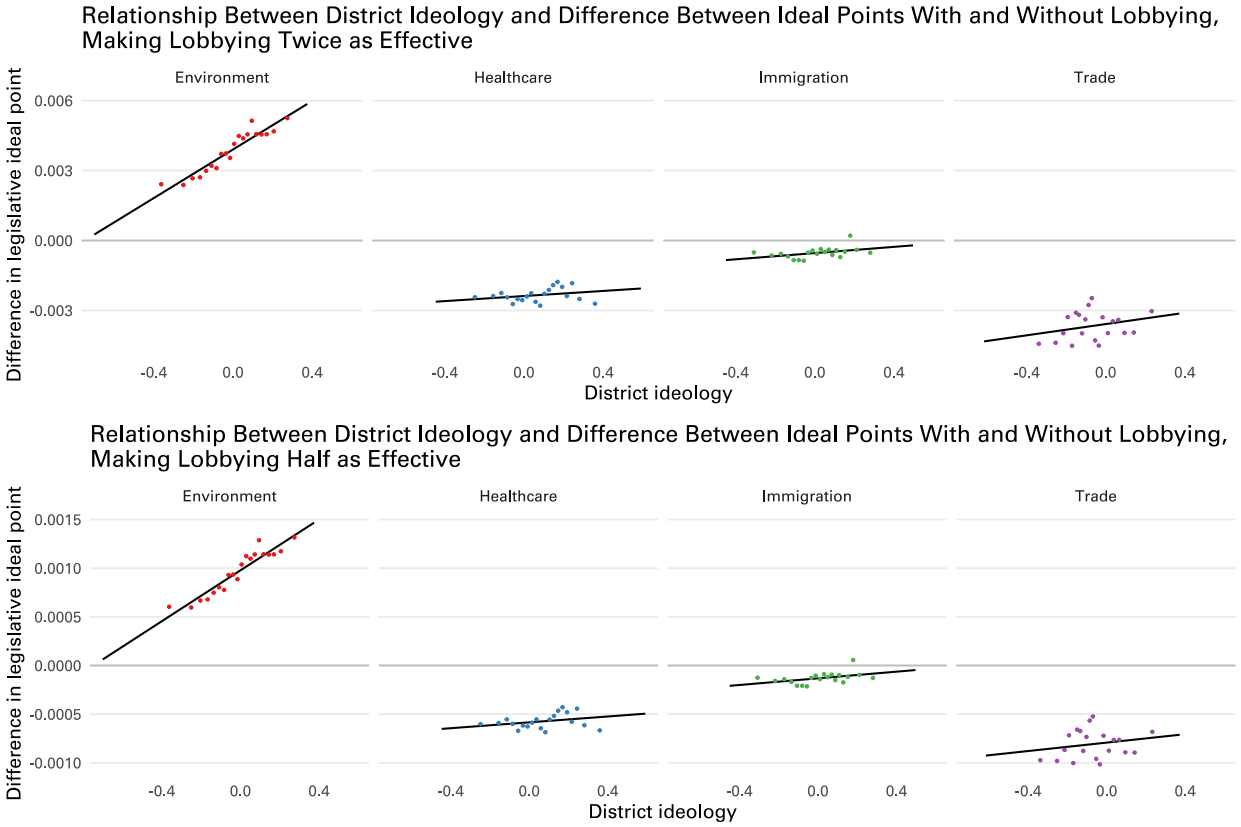

Figure A23: District Ideology and Difference in Legislator Ideal Point Due to Lobbying, Fixing the Effectiveness of Lobbying

These figures reproduce Figure 6, 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 CCES data. The y axis is the legislator's ideology inclusive of lobbying, minus their ideology net of lobbying. As in Figure 6, in both sets of panels, the measures of ideology are estimated by running an interactive fixed effects model on rollcalls, 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 4.