For Online Publication: Appendix of "The Effects of Firms' Lobbying on Resource Misallocation"

May 2021

I Construction of Lobbying Dataset

Firm's lobbying activity is built from public reports from the SOPR. These reports are required to be filled by any lobbyist in the US due to the Lobbying Disclosure Act of 1995. Lobbyists must file 3 types of reports depending on their activity, i.e., LD-1, LD-2 and LD-203.[1] The LD-1 form contains information about registrants, i.e., lobbyists, and clients such as their name, address, and principal place of business. The LD-203 form presents the disclosure of all political committees established or controlled by a lobbyist and all federal campaign contributions of $200 or more. Finally, the LD-2 form is the reporting form where registrants disclose their lobbying activities and related expenses. Dollar amounts of lobbying reported in section 12 and 13 are estimates of income (lobbyists) or expenses (in-house lobbying) spent in the reporting period rounded to the nearest $5,000. When total amount is less than $5,000, registrants should still file a report and include a statement indicating the fact.[2] In addition to the general issues categories, it is legally required that registrants report any congressional bills numbers they have lobbied as well as the description of their activities in section 16. An example LD-2 report can be found in Appendix A. We use lobbying information available from all LD-1 and LD-2 reports filed between 1999 and 2015 under the Lobbying Disclosure Act of 1995 (amended by the Honest Leadership and Open Government Act of 2007).

Since the reports are in documents that are not directly manageable to use for empirical research, there are several steps necessary to be able to use the information in them. We first directly parse the reports to build a report-level dataset. In doing so, each report is carefully examined whether there exists any amendments, and if so only the latest report is kept based on the date and time of filing. This is an important step because researchers will erroneously overweight firm's lobbying activity by duplicating multiple reports with essentially similar contents and lobbying expenses.[3]

[1] All filings are updated quarterly in a digitized compressed XML format. As of September 2015, there are more than 1 million LD-1 and LD-2 reports publicly available from http://www.senate.gov/legislative/Public_Disclosure/database_download.htm.

[2] We note that registrants were required to file reports biannually (instead of quarterly) prior to the Honest Leadership and Open Government Act of 2007 amendment. Before 2008, estimates of amounts in excess of $10,000 was rounded to the nearest $20,000. We address this difference by considering firm-year as the unit of analysis after aggregating quarterly or biannual reports for a given year.

[3] We note that no empirical study, using the lobbying reports either from SOPR or from http://www.opensecrets.org/, has discussed this problem to the best of our knowledge. Thus, we suspect that most of the existing studies might contain numerous duplicates by including both original filings and their amendments.

We then create a mapping from clients to their unique identifiers in databases such as COMPUSTAT and Orbis (Bureau van Dijk) allowing us to link firm's economic characteristics to their political behavior. Finding a unique firm identifier is challenging because the matching can be done only through client names (i.e., character strings) which tend to exist in many different formats even for the same firm. For example, Apple Inc. appears in 15 different client names: *APPLE INC*, *Apple, Inc.*, *Apple*, *Apple Inc.*, *Apple Inc*, *APPLE COMPUTER, INC.*, *APPLE*, *Apple, Inc*, *APPLE COMPUTERS*, *APPLE COMPUTER*, *APPLE COMPUTERS, INC*, *APPLE COMPUTER INC*, *APPLE INC.*, *APPLE COMPUTERS INC*, *APPLE COMPUTER, INC*. Although some of these can be easily addressed by removing dot and suffix, in many cases it is not straightforward to distinguish misspelled client names and abbreviations from their legal firm names. To address this problem, we employ four strategies. First, we use FuzzyWuzzy string matching algorithm comparing the full list of public firm names from COMPUSTAT against 61,478 unique client names.[4] Second, we use Bureau van Dijk server's Batch Search functionality to find each firm's ISIN and ticker symbol, which will then be used to find COMPUSTAT identifier code of clients.[5] Third, we use Center for Responsive Politics lobbying data to check whether any additional matching can be achieved by using their `Standardized client` variable. Finally, we randomly sample 5% of client names to verify whether any publicly trading firms were missed so that we can improve the matching algorithm from the first step. We update our matching algorithm quarterly each time a new set of reports become available. This process ends up with a database at the report level that has 972,005 observations. Each observation contains a report id, the id of the lobbyist, the total amount lobbied, whether lobbying activity was outsourced or not, all the issues lobbied, and the bill number if the information is available. For reports that are filled by COMPUSTAT firms, we have the unique identifier of COMPUSTAT firms and all the information given by COMPUSTAT.

[4] We use the following natural language processing module from Python programming language: https://pypi.python.org/pypi/fuzzywuzzy

[5] Unfortunately, the batch search can be conducted only on 1,000 firm names each time. Thus, we repeated the queries more than 60 times to get the full search results.

A LD-2 Report Example

Clerk of the House of Representatives	Secretary of the Senate
Legislative Resource Center	Office of Public Records
B-106 Cannon Building	232 Hart Building
Washington, DC 20515	Washington, DC 20510
http://lobbyingdisclosure.house.gov	http://www.senate.gov/lobby

LOBBYING REPORT

Lobbying Disclosure Act of 1995 (Section 5) - **All Filers Are Required to Complete This Page**

1. Registrant Name ☑ Organization/Lobbying Firm ☐ Self Employed Individual
Capitol Tax Partners, LLP

2. Address
Address1 101 Constitution Avenue, NW Suite 675 East Address2
City Washington State DC Zip Code 20001 Country USA

3. Principal place of business (if different than line 2)
City State Zip Code Country

4a. Contact Name: Mr. Christopher Javens
b. Telephone Number: 2022898700
c. E-mail: faddoul@capitoltax.com
5. Senate ID#: 65976-12

7. Client Name: Apple ☐ *Self* ☐ *Check if client is a state or local government or instrumentality*
6. House ID#: 356170002

TYPE OF REPORT 8. Year 2018 Q1 (1/1 - 3/31) ☑ Q2 (4/1 - 6/30) ☐ Q3 (7/1 - 9/30) ☐ Q4 (10/1 - 12/31) ☐

9. Check if this filing amends a previously filed version of this report ☐

10. Check if this is a Termination Report ☐ Termination Date 11. No Lobbying Issue Activity ☐

INCOME OR EXPENSES - YOU MUST complete either Line 12 or Line 13

12. Lobbying
INCOME relating to lobbying activities for this reporting period was:
Less than $5,000 ☐
$5,000 or more ☑ $ 90,000.00
Provide a good faith estimate, rounded to the nearest $10,000, of all lobbying related income from the client (including all payments to the registrant by any other entity for lobbying activities on behalf of the client).

13. Organizations
EXPENSE relating to lobbying activities for this reporting period were:
Less than $5,000 ☐
$5,000 or more ☐ $
14. REPORTING Check box to indicate expense accounting method. See instructions for description of options.
☐ **Method A.** Reporting amounts using LDA definitions only
☐ **Method B.** Reporting amounts under section 6033(b)(8) of the Internal Revenue Code
☐ **Method C.** Reporting amounts under section 162(e) of the Internal Revenue Code

Signature Digitally Signed By: Christopher Javens **Date** 4/19/2018 4:13:31 PM

LOBBYING ACTIVITY. Select as many codes as necessary to reflect the general issue areas in which the registrant engaged in lobbying on behalf of the client during the reporting period. Using a separate page for each code, provide information as requested. Add additional page(s) as needed.

15. General issue area code TAX

16. Specific lobbying issues

Matters dealing with International Taxation, and H.R. 1, Bill to provide for reconciliation pursuant to titles II and V of the concurrent resolution on the budget for fiscal year 2018 (bill formerly known as the Tax Cuts and Jobs Act).

17. House(s) of Congress and Federal agencies ☐ Check if None

U.S. SENATE, U.S. HOUSE OF REPRESENTATIVES, Treasury - Dept of, Executive Office of the President (EOP)

18. Name of each individual who acted as a lobbyist in this issue area

First Name	Last Name	Suffix	Covered Official Position (if applicable)	New
Jonathan	Talisman			☐
Christopher	Javens			☐

19. Interest of each foreign entity in the specific issues listed on line 16 above ☑ Check if None

Figure I.1: **Report by Apple Inc., first quarter in 2018**: A report filed by Apple Inc. shows that Capital Tax Partners, LLP lobbied on behalf of Apple Inc. to lobby on Taxation issue (Section 15). In particular, it lobbied on the House bill H.R.1 titled "An Act to provide for reconciliation pursuant to titles II and V of the concurrent resolution on the budget for fiscal year 2018" (Section 16).

II Model

This appendix presents detailed derivations of the model described in Section II.

A Model Derivations

The solution of the household problem is

$$c_s(\phi) = p_s(\phi)^{-\sigma} D_s, \tag{1}$$

where $D_s = E_s P_s^{\sigma-1}$, $P_s = \left[\int p_s(\phi)^{1-\sigma} M_s d\hat{G}_s(\phi)\right]^{\frac{1}{1-\sigma}}$ and $E_s = \theta_s E$ is the demand shifter, price index and total expenditure in sector s, respectively. Also, from sector-level optimization,

$$P = \Pi_{s=1}^{S} \left(\frac{P_s}{\theta_s}\right)^{\theta_s} \tag{2}$$

and E is the aggregate price index and aggregate expenditure, respectively. Given the solution in (1) and the fact that aggregate expenditures have to be equal to aggregate income, $E = I$, we get that sectoral output is

$$Y_s = \frac{E_s}{P_s} \tag{3}$$

where $E_s = \theta_s(wN + p_K K + T)$.

The solution to firms' optimization problem implies $p_s(\phi) = \frac{1}{\tau_s(\phi)} \frac{\mu}{\phi^P} q_s$, where

$$q_s = \left(\frac{w}{\alpha_s^N}\right)^{\alpha_s^N} \left(\frac{p_K}{\alpha_s^K}\right)^{\alpha_s^K},$$

and $\mu = \frac{\sigma}{\sigma-1}$ and $\alpha_s^K = 1 - \alpha_s^N$. Also, the revenue function is $r_s(\phi) = p_s(\phi)^{1-\sigma} D_s$ and thus $r_s(\phi) \propto (\tau_s(\phi)\phi^P)^{\sigma-1}$. Here one can see that the wedge acts in practice as a subsidy ($\tau_s(\phi) > 1$) or tax ($\tau_s(\phi) < 1$) to productivity as in Bai, Jin and Lu (2019).

Thus, the profit function is

$$\pi_s(\phi) = \begin{cases} \tau_s^{NL}(\phi)\frac{r_s(\phi)}{\sigma} - f_s^P q_s, \ if \ \phi \ produces \ without \ lobbying \\ \tau_s^{L}(\phi)\frac{r_s(\phi)}{\sigma} \left[1 - \underbrace{\sigma\delta_s \frac{\left(\phi_s^L l(\phi)\right)^{\delta_s}}{\tau_s^L(\phi)}}_{variable \ lob. \ cost}\right] - \left(f_s^P + \underbrace{f_s^L}_{fixed \ lob. \ cost}\right) q_s, \ if \ \phi \ lobbies. \end{cases}$$

Note that firms that produce without lobbying face an exogenous wedge of $\tau_s^{NL}(\phi) = \phi^D$. Relative to that, firms that produce and lobby face the wedge of $\tau_s^L(\phi) = (\phi^L l_s(\phi))^{\delta_s} + \phi^D$ and thus $\tau_s^L(\phi) > \tau_s^{NL}(\phi)$ since $\delta_s > 0$. Thus, when the firm is evaluating whether to lobby, it needs to compare the benefit given by the policy gain with both the variable and the fixed cost. This tradeoff is explicit when one evaluates the zero-profit conditions that defines selection into production and lobbying.

Firms' zero profit condition in (8) which governs selection into production imply that

$$\phi^D r_s^*(\phi^D) = \sigma f_s^P q_s \tag{4}$$

From (4) one can get a closed form solution of the productivity cutoff that selects firms into production, as a function of the exogenous component of wedges, $\phi_s^{P*}(\phi^D)$:

$$\phi_s^{P*}(\phi^D) = \left(\frac{1}{\phi^D}\right)^{\frac{\sigma}{\sigma-1}} \left(\frac{\sigma q f_s^P}{D_s}\right)^{\frac{1}{\sigma-1}} \mu q. \tag{5}$$

This expression is similar to the cutoff in a standard Melitz (2003) model.[6] It shows how the distortion ϕ^D implies that a firm with a high ϕ^D (a high subsidy), needs a lower productivity level in order to select into producing.

On the other hand, firms' zero profit condition in (9) which governs selection into lobbying imply that

$$\tau^{L**}\left(\phi^D,\phi^L\right) r^{L**}(\phi^D,\phi^L)\left[1-\sigma\delta_s\frac{\left(\phi^L l^{**}(\phi^D,\phi^L)\right)^{\delta_s}}{\tau^{L**}(\phi^D,\phi^L)}\right] - \phi^D r^{NL**}(\phi^D) = \sigma q_s f_s^L \tag{6}$$

where $\tau^{L**}\left(\phi^D,\phi^L\right) = \left(\phi^L l^{**}(\phi^D,\phi^L)\right)^{\delta_s} + \phi^D$ is the distortion, $l^{**}(\phi^D,\phi^L) = l(\phi_s^{P**}(\phi^D,\phi^L),\phi^D,\phi^L)$ is lobbying expenditure, $r^{L**}(\phi^D,\phi^L) = r^L(\phi_s^{P**}(\phi^D,\phi^L),\phi^D,\phi^L)$ is value-added when a firm lobbies and $r^{NL**}(\phi^D,\phi^L) = r(\phi_s^{P**}(\phi^D,\phi^L),\phi^D,\phi^L)$ is value-added when a firm does not lobby, all at the cutoff of selection into lobbying. One can see in (6) that selection into lobbying evaluates profits of lobbying against profits of producing without lobbying and compares it to the fixed cost of lobbying.

Define $\kappa_s(\phi) = \tau_s^L(\phi)^\sigma\left(1-\sigma\delta_s\frac{\left(\phi^L l(\phi)\right)^{\delta_s}}{\tau_s^L(\phi)}\right)$ to be the factor that scales up profits relative to non-lobbying profits, net of the variable cost of lobbying and gross of the fixed cost of lobbying. We will call this the output wedge from lobbying net of variable cost of lobbying. Then, the zero-profit condition in (6) can be written as

$$\phi_s^{P**}(\phi^D,\phi^L) = \left(\frac{1}{\kappa_s^{**}(\phi^D,\phi^L)-(\phi^D)^\sigma}\right)^{\frac{1}{\sigma-1}} \left(\frac{\sigma q_s f_s^L}{D_s}\right)^{\frac{1}{\sigma-1}} \mu q_s. \tag{7}$$

where $\kappa_s^{**}(\phi^D,\phi^L) = \kappa_s(\phi_s^{P**}(\phi^D,\phi^L),\phi^D,\phi^L)$.

The condition in Equation (7) is the selection-into-lobbying counterpart of Equation (5). It defines an implicit function between the productivity cutoff that selects firms into lobbying and (ϕ^D,ϕ^L), $\phi_s^{P**}(\phi^D,\phi^L)$. As in selection into production, selection into lobbying is distorted by ϕ^D. On top of that, selection into lobbying is distorted by ϕ^L. Firms that lobby will affect distortions $\tau_s(\phi)$ through expenditures in lobbying, $l_s(\phi)$, which in turn depends on how productive in lobbying is the firm. Thus, firms that are more productive in lobbying might lobby more, inducing higher $\tau_s(\phi)$ for those firms and thus, these firms might need a lower productivity in production in order to select into lobbying. But at the same time, these firms that lobby need to incur in greater costs. The trade-off between the benefits and direct costs of lobbying are captured in $\kappa_s(\cdot)$. These need to be compared against the indirect costs of lobbying, which is captured by ϕ^D in the right-hand side of Equation (7). Whether firms that are more productive in lobbying lobby more and get higher $\tau_s(\phi)$ depends on parameter values such as the correlation between primitives in ϕ.

[6] For comparison, take the solutions to cutoffs in Bai, Jin and Lu (2019).

Finally, combining (4) and (7), one has that the zero-profit condition of lobbying can be written as follows:

$$\frac{\phi_s^{P**}(\phi^D,\phi^L)}{\phi_s^{P*}(\phi^D)} = \left(\frac{(\phi^D)^\sigma}{\kappa_s^{**}(\phi^D,\phi^L)-(\phi^D)^\sigma}\frac{f_s^L}{f_s^P}\right)^{\frac{1}{\sigma-1}} \tag{8}$$

In other words, firms select endogenous up until the point in which (8) holds. This equation summarizes the two forces that affect selection into lobbying, relative to selection into production, $\phi_s^{P**}(\phi^D,\phi^L)/\phi_s^{P*}(\phi^D)$. First, as shown in the first term on the right-hand side of Equation (8), highlights that lobbying affects the output wedge (net of the variable lobbying cost), $\kappa_s(\cdot)$, that the firm receives relative to not lobbying, ϕ^D. Second, as shown in the second term of the right-hand side of (8), selection into lobbying relative to production is determined by the lobbying fixed cost relative to production fixed cost.

Using the zero-profit condition, one can write the value-added function as follows:

$$r_s(\phi) = \begin{cases} \left(\frac{\phi^P}{\phi^{P*}(\phi^D)}\right)^{\sigma-1}\frac{\sigma q_s f_s^P}{\phi^D}, \; if \; \phi_s^{P*}(\phi^D) \leq \phi^P < \phi_s^{P**}(\phi^D,\phi^L), \\ \left(\tau_s(\phi)\frac{\phi^P}{\phi^{P**}(\phi^D,\phi^L)}\right)^{\sigma-1}\frac{\sigma q_s f_s^L}{\kappa_s^{**}(\phi^D,\phi^L)-(\phi^D)^\sigma}, \; if \; \phi^P \geq \phi_s^{P**}(\phi^D,\phi^L), \end{cases} \tag{9}$$

Given this, one can write the profit function as follows:

$$\pi_s(\phi) = \begin{cases} \left[\left(\frac{\phi^P}{\phi_s^{P*}(\phi^D)}\right)^{\sigma-1}-1\right] q_s f_s^P, \; if \; \phi_s^{P*}(\phi^D) \leq \phi^P < \phi_s^{P**}(\phi^D,\phi^L), \\ \frac{\kappa_s(\phi)}{\kappa_s^{**}(\phi^D,\phi^L)-(\phi^D)^\sigma}\left(\frac{\phi^P}{\phi_s^{P**}(\phi^D,\phi^L)}\right)^{\sigma-1}-1\Big] q_s f_s^L - q_s f_s^P, \; if \; \phi^P \geq \phi_s^{P**}(\phi^D,\phi^L), \end{cases}$$

Note that, in order to evaluate the benefits of lobbying, the firm needs to compare the effect of $\kappa_s(\phi)$ and ϕ^D against the fixed cost. This is the only difference relative to the results in the closed economy version of the model in Melitz (2003).

Given selection into lobbying, average profits, conditional on successful entry can be expressed as:

$$\bar{\pi}_s = \left(1-\xi_s^L\right)\bar{\pi}_s^{NL} + \xi_s^L\bar{\pi}_s^L, \tag{10}$$

where

$$\begin{aligned} \bar{\pi}_s^{NL} &= \int_{\phi_s^*}^{\phi_s^{**}} \pi_s(\phi)\frac{dG(\phi)}{G(\phi_s^{**})-G(\phi_s^*)}, \\ \bar{\pi}_s^{L} &= \int_{\phi_s^{**}}^{\infty} \pi_s(\phi)\frac{dG(\phi)}{1-G(\phi_s^{**})}, \\ \xi_s^L &= \frac{1-G(\phi_s^{**})}{1-G(\phi_s^*)} \end{aligned} \tag{11}$$

where ξ_s^L is the probability of lobbying in sector s, $G(\phi_s^{**}) = \int\int\int_0^{\phi_s^{P**}(\phi^D,\phi^L)} g(\phi)d\phi^P d\phi^D d\phi^L$ is the mass of firms with productivity below $\phi_s^{P**}(\phi^D,\phi^L)$ and $G(\phi_s^*) = \int\int\int_0^{\phi_s^{P*}(\phi^D)} g(\phi)d\phi^P d\phi^D d\phi^L$ the mass of firms with productivity below $\phi_s^{P*}(\phi^D)$.[7] Average revenue, $\bar{r}_s$ can be defined similarly.

[7]We abuse notation in writing $\bar{\pi}_s^{NL}$ and $\bar{\pi}_s^L$. For example, the full correct expression for average profits of firms that produce without lobbying should be $\bar{\pi}_s^{NL} = \int\int\int_{\phi_s^{P*}(\phi^D)}^{\phi_s^{P**}(\phi^D,\phi^L)} \pi_s(\phi)\frac{g(\phi)}{G(\phi_s^{**})-G(\phi_s^*)}d\phi^P d\phi^D d\phi^L$. We use this abuse of notation throughout the paper to make notation easier.

Given selection into entry, the *ex-post* primitives distribution conditional on successful entry is:

$$\hat{G}_s(\phi) \quad = \quad \begin{cases} \frac{g(\phi)}{1-G(\phi_s^*)}, \ if \ \phi^P \geq \phi_s^{P*}(\phi^D), \\ 0, otherwise \end{cases}$$

The value of a firm is $v(\phi) = \max\left\{0, \frac{\pi_s(\phi)}{\eta}\right\}$. Thus, the free entry condition, $(1-G(\phi_s^*))\,\bar{\pi} = \eta q_s f_s^E$, can be written as follows:

$$\int_{\phi_s^*}^{\phi_s^{**}} \left[\left(\frac{\phi_s^P}{\phi_s^{P*}(\phi^D)}\right)^{\sigma-1} - 1\right] f_s^P dG(\phi) + \int_{\phi_s^{**}}^{\infty} \left[\left(\frac{\kappa_s(\phi)}{\kappa_s^{**}(\phi^D,\phi^L) - (\phi^D)^\sigma}\left(\frac{\phi^P}{\phi_s^{P**}(\phi^D,\phi^L)}\right)^{\sigma-1} - 1\right) f_s^L - f_s^P\right] dG(\phi) \quad = \quad \eta f_s^E \tag{12}$$

‘ In equilibrium, the mass of successful entrants equals the mass of exciting firms: $[1-G(\phi_s^*)]\,M_s^E = \eta M_s$, where M_s is total number of firms and M_s^E the constant mass of entering firms in sector s. Also, free entry implies that total payments to labor used in entry must equal aggregate profits, $N^E = M^E f_s^E = M\bar{\pi} = \Pi$. Finally, $R - \Pi = w(N^P + N^L) + p_K K$. Thus, labor market clearing condition implies that $N = N^P + N^L + N^E = R - p_K K$, where we set $w = 1$ as the numeraire.

The model has simple aggregation properties, as in Melitz (2003). The sectoral price index can be written as:

$$P_s \quad = \quad M_s^{\frac{1}{1-\sigma}} p_s(\tilde{\phi}_s), \tag{13}$$

where

$$p_s(\tilde{\phi}_s) \quad = \quad \frac{\mu}{\tilde{\phi}_s^P} q_s,$$

$$\tilde{\phi}_s^P \quad = \quad \left[\frac{M_s^{NL}}{M_s}\left(\tilde{\phi}_s^{P,NL}\right)^{\sigma-1} + \frac{M_s^L}{M_s}\left(\tilde{\phi}_s^{P,L}\right)^{\sigma-1}\right]^{\frac{1}{\sigma-1}}, \tag{14}$$

$$\tilde{\phi}_s^{P,NL} \quad = \quad \left[\int_{\phi_s^*}^{\phi_s^{**}} \left(\phi^D \phi^P\right)^{\sigma-1} \frac{dG(\phi)}{G(\phi_s^{**}) - G(\phi_s^*)}\right]^{\frac{1}{\sigma-1}}, \tag{15}$$

$$\tilde{\phi}_s^{P,L} \quad = \quad \left[\int_{\phi_s^{**}}^{\infty} \left(\tau_s(\phi)\phi^P\right)^{\sigma-1} \frac{dG(\phi)}{1 - G(\phi_s^{**})}\right]^{\frac{1}{\sigma-1}}, \tag{16}$$

where $M_s^{NL} = (1-\xi_s^L)M_s$ and $M_s^L = \xi_s^L M_s$ is the mass of successful entry firms that do not select and select into lobbying activity, respectively.

Given the first-order conditions of firms, we get that

$$N_s \quad = \quad \frac{\alpha_s^N}{\mu}\frac{R_s}{w},$$

$$K_s \quad = \quad \frac{\alpha_s^K}{\mu}\frac{R_s}{p_K}, \tag{17}$$

where $R_s = M_s \bar{r}_s$ is aggregate value-added of sector s.

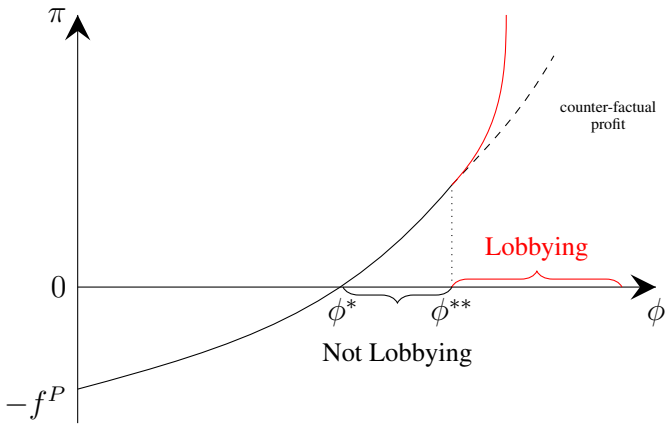

Figure II.1: Equilibrium Cutoffs and Profits

B Solution Algorithm of the Model

The steps taken to solve the model are the following:

1. Guess $\phi_s^{P*}(\phi^D)$, $\phi_s^{P**}(\phi^D, \phi^L)$ and $l(\cdot)$.
2. Compute $\kappa_s^{**}(\phi^D, \phi^L)$, $\tau(\phi)$, $r(\phi)$, $p(\phi)$, P, T and I using the equations from Section II.
3. Update $l(\cdot)$ from Equation (23).
4. Update $\phi^{P*}(\phi^D)$ and $\phi^{P**}(\phi^D, \phi^L)$ from the ZPC in (5) and (8).
5. Return to step (1) until convergence.

C A Microfoundation for Mapping Lobbying to Economic Distortions

Overview of the Model In Section II, we employed an exogenous mapping between firms' lobbying effort and distortions. In this section we propose one microfoundation for this mapping based on a game between the government and firms. The government cares about the household's utility, and thus about efficiency. However, it also values lobbying expenditures. Thus, in exchange for lobbying expenditures, the government is willing to give away efficiency by creating distortions. These distortions act as private benefits for firms, for which firms are willing to incur lobbying expenses. By endogeneizing the mapping between distortions and lobbying, this model proposes one microfoundation for the misallocation of resources across firms. By giving more benefits to firms that lobby more, the government introduces dispersion in the marginal revenue products of factors that firms spend on, and thus on revenue total factor productivity, $TFPR_s(\phi)$. Dispersion in this measure across firms within sectors represents misallocation in the economy.

Setup The game between the government and firms consists of three stages. In the first stage, firms choose whether to enter, whether to lobby, and how much to lobby. In the second stage, the government chooses distortions given firms' lobbying efforts. In the final stage, firms choose how much to produce given the government's policies and the household chooses its consumption. The final stage can be thought of as a regular firm model with distortions, similar to the one in Hsieh and Klenow (2009). The

difference here is that the distortions in our model are endogenous to firms' political activities in a game between firms and the government. Given perfect foresight and no uncertainty, we solve the model with backward induction.

Stage three of this game is a regular firm model and has the same structure as that described in Section II.[8] The only difference is that in stage three, there is no longer a lobbying decision. By this stage, firms have already made their lobbying decisions and distortions are already defined. Note that distortions are given at this stage.

In stage two, the government solves the following problem:

$$W = \max_{\tau_s(\cdot)} \quad V^C\left(\{p(\phi)\},\{\tau(\phi)\}\right) + a\underbrace{\left[\int \left(\phi^L l(\phi)\right)^{\frac{\sigma^L-1}{\sigma^L}} d\hat{G}(\phi)\right]^{\frac{\sigma^L}{\sigma^L-1}}}_{L} \tag{18}$$

$$s.t.$$

$$V^C\left(\{p(\phi)\},\{\tau(\phi)\}\right) = \frac{I-T}{P} \tag{19}$$

$$\frac{\partial y(\phi)}{\partial \tau(\phi)} = \sigma \frac{y(\phi)}{1+\tau(\phi)} \tag{20}$$

$$\frac{\partial l(\phi)}{\partial \tau(\phi)} = \frac{\partial \pi(\phi)}{\partial \tau(\phi)}, \tag{21}$$

where $V^C\left(\{p(\phi)\},\{\tau(\phi)\}\right)$ is the household's indirect utility, L is a CES aggregator of lobbyists' expenditures, and a is the weight given to the political rents. That is, government welfare is the sum of household's welfare and the welfare from lobbying activity. The government may care about lobbying activity for several reasons. The simplest one is that lobbyists can save government resources if they provide services that the government would otherwise have to spend on, such as preparing studies on the impact of bills or even writing congressional bills. For the purpose of our analysis, we do not take a stand on the source of this interest. We claim that an objective function like this can provide one analytical microfoundation for the relevant mapping between lobbying effort and wedges.[9] Equations (19) and (20) come from the household and firms' problems in stage 3. Equation (21) is a condition that says that firms are *truth-telling* in terms of how much they are willing to spend on lobbying the government in return for an extra revenue of wedges. Note that this condition is effectively using the optimality in the decision to lobby in the first stage of the game. This condition is important because it avoids coordination issues that could arise otherwise, which are beyond the scope of this paper.

Finally, in the first stage, firms choose whether to lobby and how much to spend conditional on lobbying, and whether to enter the market.

Proposition 1. *The solution to the problem stated in Equations* (18)-(21) *is the following:*

$$\frac{\tau(\phi)}{1+\tau(\phi)} = 1+\sigma+a\frac{\phi^L}{\sigma-1}\left(\phi^L\frac{l(\phi)}{L}\right)^{\frac{1}{\sigma^L}}\left(\frac{1-G(\phi^{P**}(\phi^D,\phi^L),\phi^D,\phi^L)}{1-G(\phi^{P*}(\phi^D),\phi^D)}\right) \tag{22}$$

[8] In order to simplify the exposition and develop the intuition of this model, we assume one sector and one factor of production (e.g., labor). Extending the model to a multi-sector and multi-factor environment is straightforward.

[9] This welfare function is a generalization of the one used in Grossman and Helpman (1994). In fact, in the limit $\sigma^L \to 1$, for all sectors, it becomes the same welfare function where the government aggregates lobbying effort linearly. Thus, our specification for the welfare function generalizes that in Grossman and Helpman (1994).

Proposition 1 provides an endogenous mapping from lobbying effort to economic distortions that is similar to the one used in the main text in Equation (3). This mapping depends on exogenous distortions given by σ and on lobbying expenditure and lobbying productivity up to an exponent, which is a function of σ^L. Furthermore, this proposition highlights three predictions of how the government allocates distortions in this game. First, if the government does not value firms' lobbying expenditures ($a = 0$), then $\tau(\phi)/(1+\tau(\phi)) = 1+\sigma$. That is, the government will still allocate a flat tax within sectors. Second, if the government does value lobbying ($a > 0$), then distortions are heterogeneous depending on how much lobbying firms engage in. How much distortions vary across firms depends crucially on σ^L, the elasticity of substitution of lobbying contributions. The higher σ^L, the easier the government substitutes lobbying expenditures between firms, and thus very few firms lobby. In other words, the higher σ^L, the less $\tau(\phi)$ varies with $l(\phi)$. In the limit, when lobbying expenditures are perfect substitutes ($\sigma^L \to \infty$), $\tau(\phi)$ is independent from $l(\phi)$.[10] The intuition behind these results is important. Why would the government appreciate a variety in the firms that engage in lobbying? One reason could be that lobbying entails political risks. Being subject to the influence of only one lobbyist could be politically costly for the government because the saliency will make it relatively easier for the household to identify the source of welfare loss. In contrast, if influence is dispersed across many lobbyists, it might be more difficult for the household to hold the government responsible for its political rent-seeking. Thus, the love for variety could arise due to the government's preference to reduce the political risk that comes if the household organizes political opposition to lobbying influence. This is how the model justifies heterogeneous distortions and lobbying expenditures at the firm level. The facts shown in Section I are consistent with this view of lobbying behavior, in particular Fact 7 that suggests that lobbying seem to be working as a private good that benefits specific firms. Finally, $\tau(\phi)/(1+\tau(\phi))$ increases with the mass of firms lobbying, $\frac{1-G(\phi^{P**}(\phi^D,\phi^L),\phi^D,\phi^L)}{1-G(\phi^{P*}(\phi^D),\phi^D)}$.

D Proofs

This subsection presents the main proofs of the propositions in the paper.

Proof of Proposition 1. As shown in Appendix A, the zero-profit condition of producing and lobbying imply Equations (5)-(7). Combining them implies Equation (10). ■

Proof of Proposition 2. The first order condition of firms' intensive margin lobbying decision is the following:

$$\delta_s(\phi^L l_s(\phi))^{\delta_s} r_s(\phi) = w l_s(\phi) \tag{23}$$

By taking logs and rearranging one arrives to Equation (12). ■

Proof of Proposition 3. Firms' first order conditions imply that the marginal revenue product of factors are the following:

$$MRPN_s(\phi) \equiv \frac{\partial r_s(\phi)}{\partial n_s(\phi)} = \frac{\sigma-1}{\sigma}\alpha_s^N \frac{r_s(\phi)}{n_s(\phi)} = \frac{w}{\tau_s(\phi)}$$
$$MRPK_s(\phi) \equiv \frac{\partial r_s(\phi)}{\partial k_s(\phi)} = \frac{\sigma-1}{\sigma}\alpha_s^K \frac{r_s(\phi)}{k_s(\phi)} = \frac{p_K}{\tau_s(\phi)}$$

[10] Note that in this case, one arrives at the specification of the government's welfare in Grossman and Helpman (1994).

Define aggregate labor used in variable costs at the sector level as $N_s^P = \int n_s(\phi) M_s d\hat{G}_s(\phi)$ and similar objects for capital and intermediate inputs. Define also the weighted average marginal revenue products of labor as $\overline{MRPN}_s = \frac{1}{\int MRPN_s(\phi)\frac{r_s(\phi)}{P_s Y_s} M_s d\hat{G}_s(\phi)}$, where the weights are value-added shares, and similar for capital. Using these relationships, the standard monopolistic competition pricing and the standard CES ideal price index, one has the following:

$$
\begin{aligned}
Y_s &= \Phi_s^P N_s^{\alpha_s^N} K_s^{\alpha_s^K} \\
\Phi_s^P &= \frac{M_s^{\frac{1}{\sigma-1}}}{\mu} \left(\frac{N_s^P}{N_s}\right)^{\alpha_s^N} \left(\frac{K_s^P}{K_s}\right)^{\alpha_s^K} \left(\frac{\overline{MRPN}_s}{\alpha_s^N}\right)^{\alpha_s^N} \left(\frac{\overline{MRPK}_s}{\alpha_s^K}\right)^{\alpha_s^K} \left[\int \left(\tau_s(\phi)\phi^P\right)^{\sigma-1} d\hat{G}_s(\phi)\right]^{\frac{1}{\sigma-1}}
\end{aligned}
$$

Finally, define TFPR at the firm and sector level, respectively, as $TFPR_s(\phi) = \mu \left(\frac{MRPN_s(\phi)}{\alpha_s^N}\right)^{\alpha_s^N} \left(\frac{MRPK_s(\phi)}{\alpha_s^K}\right)^{\alpha_s^K}$ and $\overline{TFPR}_s = \mu \left(\frac{\overline{MRPN}_s}{\alpha_s^N}\right)^{\alpha_s^N} \left(\frac{\overline{MRPK}_s}{\alpha_s^K}\right)^{\alpha_s^K}$, then one has the result:

$$
\Phi_s^P = M_s^{\frac{1}{\sigma-1}} \left(\frac{N_s^P}{N_s}\right)^{\alpha_s^N} \left(\frac{K_s^P}{K_s}\right)^{\alpha_s^K} \left[\int \left(\phi^P \frac{\overline{TFPR}_s}{TFPR_s(\phi)}\right)^{\sigma-1} d\hat{G}_s(\phi)\right]^{\frac{1}{\sigma-1}}
$$

■

Proof of Proposition 1. Using the first order conditions of the problem stated in Equations (18)-(21) and assuming that $w = 1$, one has the following:

$$
\frac{a}{P}\left[\frac{\partial T}{\partial \tau(\phi)} + \frac{\partial P}{\partial \tau(\phi)} Y\right] = \left(\phi^L\right)^{\frac{\sigma^L-1}{\sigma^L}} \left(\frac{l(\phi)}{L}\right)^{\frac{1}{\sigma^L}} \frac{\partial l(\phi)}{\partial \tau(\phi)} \hat{f}^L(\phi)
$$

This highlights that in setting $\tau(\phi)$, the government compares the benefit of obtaining more lobbying expenditures and affecting the household's welfare. The latter is a combination of affecting the household's income through changes in T and the price index P. Using the constraints in Equations (18)-(21) and rearranging, one arrives to the result of Equation (22)

■

III Illustration of the Instrument Variable

Figure III.1 shows the returns of lobbying to three firms when their own "connected" politicians change committee memberships in two periods.

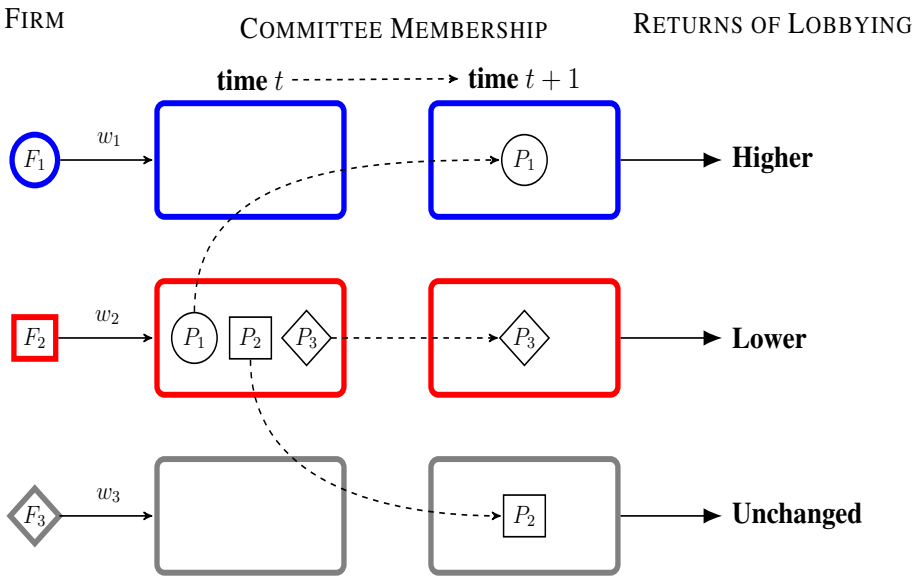

Figure III.1: **The Effects of Committee Membership Changes on Values of Lobbying**: This figure illustrates the identification strategy employed in the empirical analysis. It shows the returns of lobbying when three politicians (P_1, P_2, and P_3) who served in Red committee (middle) at time t change their committee memberships at $t+1$. Specifically, P_1 moves from Red (middle) to Blue (top) committee; P_2 changes her membership to Gray (bottom) committee; and P_3 stays in Red committee. The color of committee represents the most valuable committee for F_1, F_2 (red), and F_3 with the same boundary color. Firms and politicians with the same shape (e.g., F_1 and P_1) are assumed to be politically connected. We assume that the change of committee membership affects the value of lobbying. For example, F_1's lobbying is expected to have higher returns than before when the politician that it has a closer tie to (i.e., P_1) moves to the committee that it values. In contrast, the value of lobbying would decrease for F_2 when its connected politician leaves its most valuable red committee.

IV Supporting Facts

In this appendix we document a set of facts that support the analysis in the main text.

A Stylized Facts

NAICS	Code	# Firms	% Lobbied	% In-house	Median Expense	Example Firm
Agriculture, Forestry, Fishing/Hunting	11	26	20.4	7.6	$50,000	MONSANTO CO
Mining, Quarrying, and Oil/Gas Extraction	21	460	9.9	3.8	$40,000	RIO TINTO GROUP (GBR)
Utilities	22	289	22.7	15.3	$50,000	ENEL SPA
Construction	23	99	10.8	3.8	$30,000	FLUOR CORP
Manufacturing	31-33	2,930	15.8	6.5	$40,000	NESTLE SA/AG
Wholesale Trade	42	220	8.1	3.4	$40,000	MCKESSON CORP
Retail Trade	44-45	282	11.2	5.1	$60,000	CVS HEALTH CORP
Transportation and Warehousing	48-49	224	18.6	9.0	$45,000	ENI SPA
Information	51	964	11.9	4.8	$50,000	AT&T INC
Finance and Insurance	52	2,336	5.1	2.6	$50,000	UNITEDHEALTH GROUP INC
Real Estate and Rental and Leasing	53	353	6.5	0.8	$40,000	BROOKFIELD ASSET MANAGEMENT
Professional, Scientific, and Technical SVC	54	330	12.1	3.4	$40,000	ACCENTURE PLC
Admin/Waste Management/Remediation SVC	56	156	17.7	4.5	$40,000	MANPOWERGROUP
Educational Services	61	35	24.6	8.3	$40,000	GRAHAM HOLDINGS CO
Health Care and Social Assistance	62	130	21.9	6.8	$50,000	HUMANA INC
Arts, Entertainment, and Recreation	71	58	13.1	3.2	$30,000	LIVE NATION ENTERTAINMENT
Accommodation and Food Services	72	141	12.2	5.5	$50,000	SODEXO
Other Services (except Public Administration)	81	22	7.8	0.0	$40,000	SERVICE CORP INTERNATIONAL

Table IV.1: **Descriptive Statistics across NAICS 2-digit Sectors.** This table presents descriptive statistics of lobbying activities across all COMPUSTAT firms in 21 NAICS 2-digit sectors. The numbers are the averages from 1999 to 2017. For example, we see that, on average, there are about 2,930 firms in the manufacturing sector and 15.8% of them have lobbying expenditures, on average. Of these, about 6.5% have in-house lobbying departments. The median lobbying expenses of firms in each sector ranges from $30,000 to $60,000 per quarter. The last column presents an example of a firm from that sector who lobbied.

B Distribution of the Number of Lobbying Clients

Issues	Mean	Median	Minimum	Maximum	Total Number of Bills
Accounting	1.4	1	1	12	1,043
Advertising	5.2	4.5	1	27	82
Aerospace	2.6	2	1	15	76
Agriculture	2.6	2	1	195	1,082
Alcohol and Drug Abuse	2.1	1	1	10	200
Animals	2.1	2	1	11	412
Apparel Industry	1.5	1	1	7	140
Arts and Entertainment	1.9	1	1	7	42
Automotive Industry	3.8	2	1	37	319
Aviation	4.1	2	1	93	836
Bankruptcy	4.4	2	1	29	78
Banking	3.0	2	1	45	1,646
Beverage Industry	3.3	3	1	15	27
Budget Appropriations	8.2	2	1	421	2,577
Chemicals	4.8	2	1	83	124
Civil Rights	1.9	2	1	40	1,263
Clean Air and Water	5.7	2	1	104	1,289
Commodities	8.1	3	1	35	35
Communications	3.0	2	1	52	757
Computer Industry	4.1	2	1	24	255
Constitution	1.6	1	1	9	141
ConsumerIssues	5.5	2	1	73	825
Copyright	8.4	3	1	151	577
Defense	6.3	2	1	149	985
Disaster Planning	1.9	1	1	9	261
District of Columbia	1.9	2	1	9	29
Economics	2.1	1	1	18	191
Education	1.9	1	1	32	2,825
Energy Nuclear	6.0	3	1	328	2,780
Environment	3.0	2	1	190	1,117
Family Issues	1.6	2	1	15	726
Financial Institutions	4.2	2	1	338	1,404
Firearms	1.6	1	1	12	644
Food Industry	3.1	2	1	72	560
Foreign Relations	1.6	1	1	19	1,322
Fuel, Gas and Oil	3.1	2	1	20	264
Gambling	3.4	2	1	16	99
Government Issues	2.0	1	1	139	2,399
Health Issues	3.1	2	1	319	6,797
Homeland Security	8.2	2	1	158	816
Housing	2.2	2	1	35	722
Immigration	2.8	2	1	133	1,249
Indian Affairs	1.6	1	1	11	495
Insurance	4.0	2	1	82	931
Intelligence	4.0	3	1	17	58
Law Enforcement	1.8	1	1	30	1,172
Manufacturing	2.4	1.5	1	25	90
Marine and Boating	2.2	2	1	27	561
Media	3.1	2	1	17	53
Medical	1.7	1	1	7	209
Medicare	3.1	2	1	118	2,726
Minting Money	1.6	1	1	6	55
Natural Resources	2.1	2	1	41	1,661
Pharmacy	3.9	2	1	27	269
Postal	3.2	1	1	29	211
Railroads	6.2	3	1	56	307
Real Estate	1.6	1	1	5	502
Religion	1.3	1	1	3	93
Retirement	3.3	2	1	134	1,062
Roads and Highway	4	2	1	49	71
Science and Technology	2.7	2	1	30	400
Small Business	1.8	1	1	10	483
Sports and Athletics	1.7	1	1	6	59
Tariffs and Miscellaneous	1.7	1	1	30	1,655
Taxation	4.4	2	1	491	5,940
Telecommunications	4.8	3	1	77	1,219
Tobacco	3.6	3	1	24	222
Torts	5	2	1	64	237
Trade	3.2	2	1	135	1,862
Travel and Tourism	3.2	2	1	17	95
Trucking and Shipping	3.8	2	1	33	128
Unemployment	2.0	2	1	6	48
Urban Development	1.8	1	1	9	152
Utilities	3.8	2	1	29	185
Veterans	1.5	1	1	16	2,664
Waste	2.0	1	1	8	59
Welfare	1.5	1	1	7	97
Total	3.5	2	1	491	65,047

Table IV.2: This table shows that the skewed distribution that we observed in Figure 6 in Section I of the main text holds true for various other issues. We categorize each bill based on the frequency of the bill's appearance under particular issue codes across reports. Most bills are lobbied by one or two interest groups.

C Changes in Committee Membership

This subsection highlights in more detail how committee membership changes over time for politicians. Figure IV.2 shows the likelihood of switching committees, for each politician and each congress. Blue squares indicate that a politician did not change any committee membership between two congresses. As one can see, there are few politicians that never change their committee membership, i.e., politicians that have only blue squares in their corresponding row. To understand the quantitative meaning of this, Panel (a) of Figure IV.3 shows the likelihood of a politician changing a committee over time. It shows that this likelihood is on average 24 percent across Congress. Furthermore, it highlights that this number has been fairly constant over time.

Nevertheless, the instrument captures changes of the presence of a state (through the representatives from that state) in a committee. If a state has churning of politicians but those politicians serve in the same committee as the previous ones from that state, then the instrument would not change for firms located in that state. Thus, it is important to report the churning of committees at the state level. Panel (b) of Figure IV.3 reports an average churning of 17 percent across Congress. This means that in a particular Congress, the average state had a probability of having a representative in a new committee of 17 percent. As with the churning at the politician level, churning at the state level has been relatively stable over time.

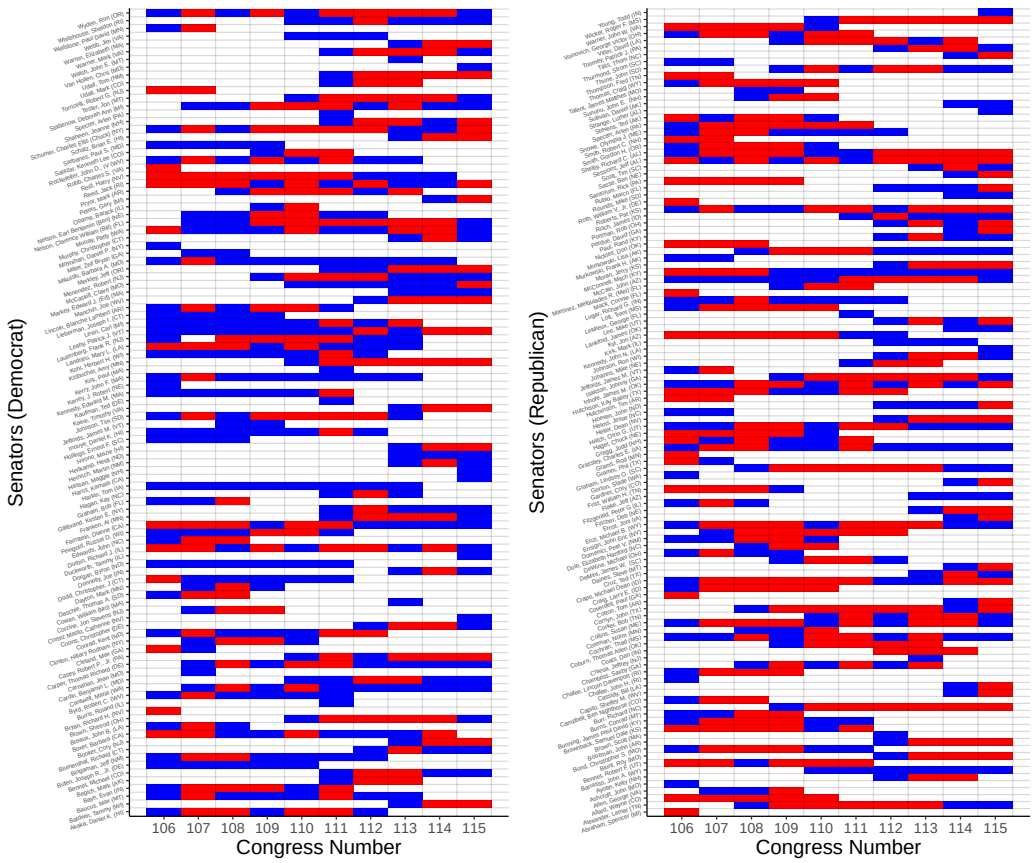

Figure IV.1: **Churning in Committee Membership**: This figure depicts the frequency of committee membership changes for each senator. Red (Blue) cell indicates that the senator moved to at least one (no) new committee in the congress that he/she did not serve in the previous congress. The white cell denotes the congress that the politician did not serve.

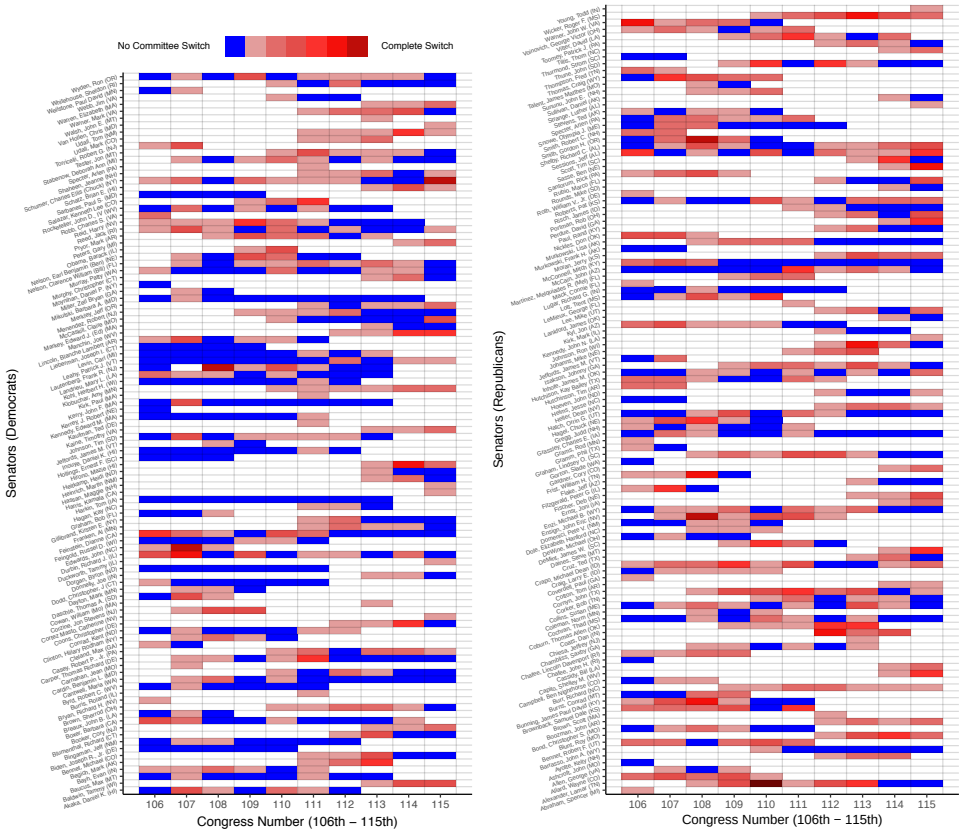

Figure IV.2: **Changes in Committee Membership**: This figure distinguishes the degrees of committee membership changes for democrats (left) and republicans (right), providing further details to Figure IV.1.

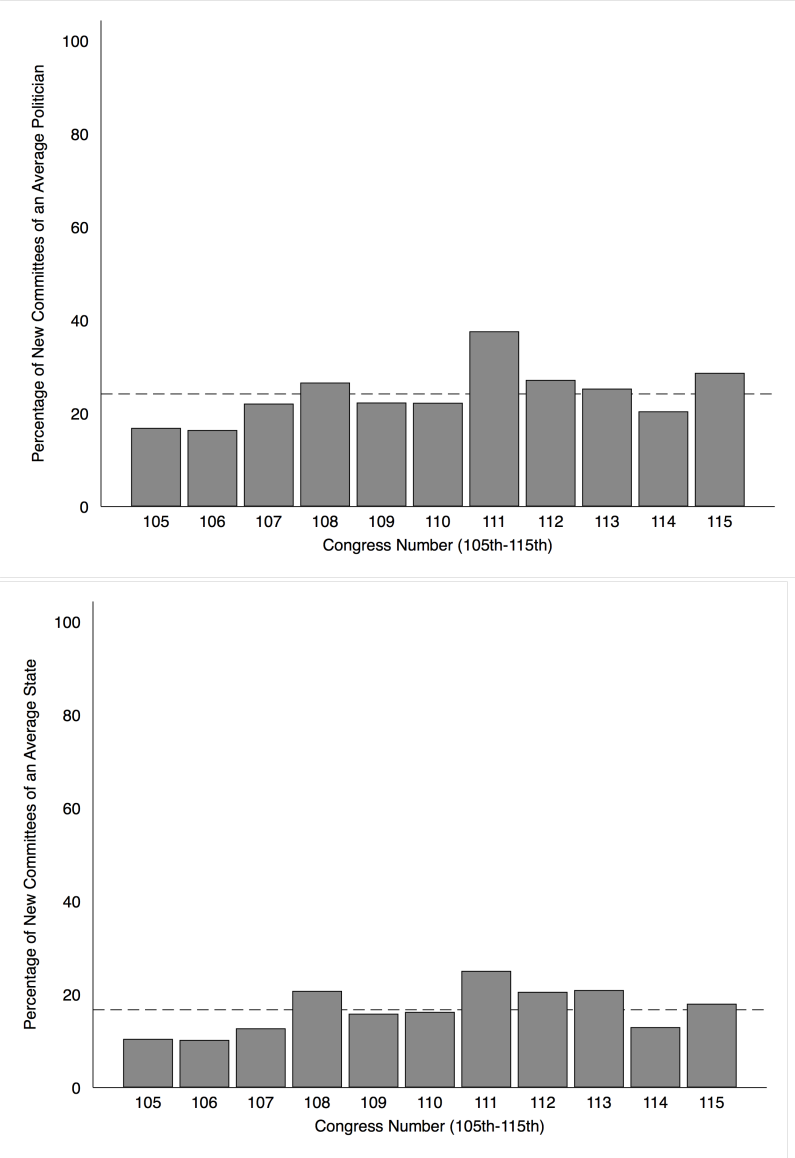

Figure IV.3: **Changes in Committee Membership**: Panel (a) of this figure shows the percentage of new standing committees the average politician participates in each Congress. If the average politician participates in 4 committees each Congress, then that means that one of those committees will be a new committee for her given that the percentage of new committees is 24 percent. Panel (b) presents the same statistics at the state level. It shows the percentage of new standing committees the average state participates in each Congress. It is on average 17 percent across Congress. Since the average number of committees that the average state participates in is 16, around 3 of those committees are new for that state.

D Relevance of Co-Location Connections

The identification strategy of the paper exploits the idea that the co-location of firms' headquarters and politicians' State is a good proxy for measuring connections between firms and politicians. In this subsection we provide supporting evidence for this conjecture. Using a dataset of campaign contributions of firms, we document the share of campaign contributions done by public firms to candidates from a state that is given by firms that have headquarters in the same state. We show this for each state in Figure IV.4. The average across states is 92 percent (blue line in Figure IV.4). This means that in the average state, 92 percent of total contributions of public firms done to candidates from that state are done from public firms with headquarters in the same state of the candidate.

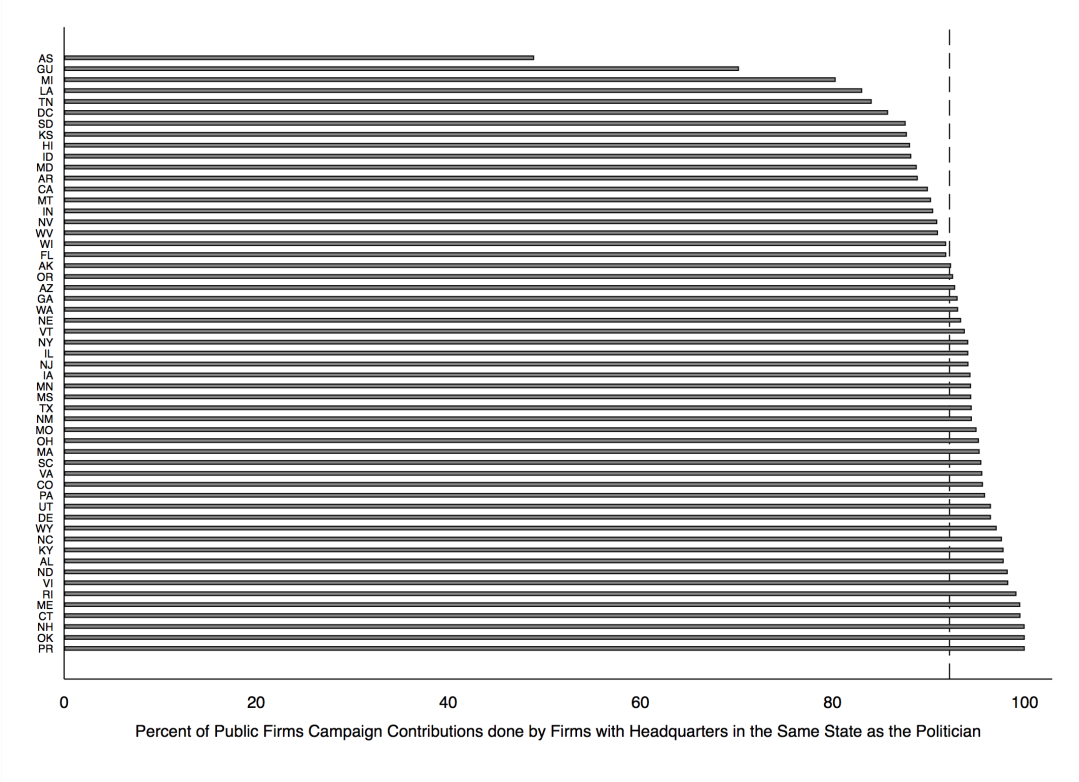

Figure IV.4: **Campaign Contributions from Firms in the Same State**: This figure documents the share of total campaign contributions of public firms to candidates in each state that is done by firms that have headquarters in the same state as the candidate. Each bar presents this statistics for each state. The blue line presents the average across states, which is 92 percent.

E List of Standing Committees

Senate	House
Agriculture, Nutrition, and Forestry	Agriculture
Appropriations	Appropriations
Armed Services	Armed Services
Banking, Housing, and Urban Affairs	Budget
Budget	Education and the Workforce
Commerce, Science, and Transportation	Energy and Commerce
Energy and Natural Resources	Ethics
Environment and Public Works	Financial Services
Finance	Foreign Affairs
Foreign Relations	Homeland Security
Health, Education, Labor, and Pensions	House Administration
Homeland Security and Governmental Affairs	Judiciary
Judiciary	Natural Resources
Rules and Administration	Oversight and Government Reform
Small Business and Entrepreneurship	Rules
Veterans' Affairs	Science, Space, and Technology
	Small Business
	Transportation and Infrastructure
	Veterans' Affairs
	Ways and Means

Table IV.3: This table presents the list of standing committees in the Senate and the House that we consider in the analysis.

F Distribution of Lobbying Activity

In this subsection we document the distribution of lobbying activity across different economic and political dimensions. Figure IV.5, IV.6, IV.7, IV.8 and IV.9 present the distribution of lobbying activity across congress, committee, lobbying issues, industry and state, respectively. It shows these distribution both in terms of number of firms (unweighted) and lobbying expenditure (weighted).

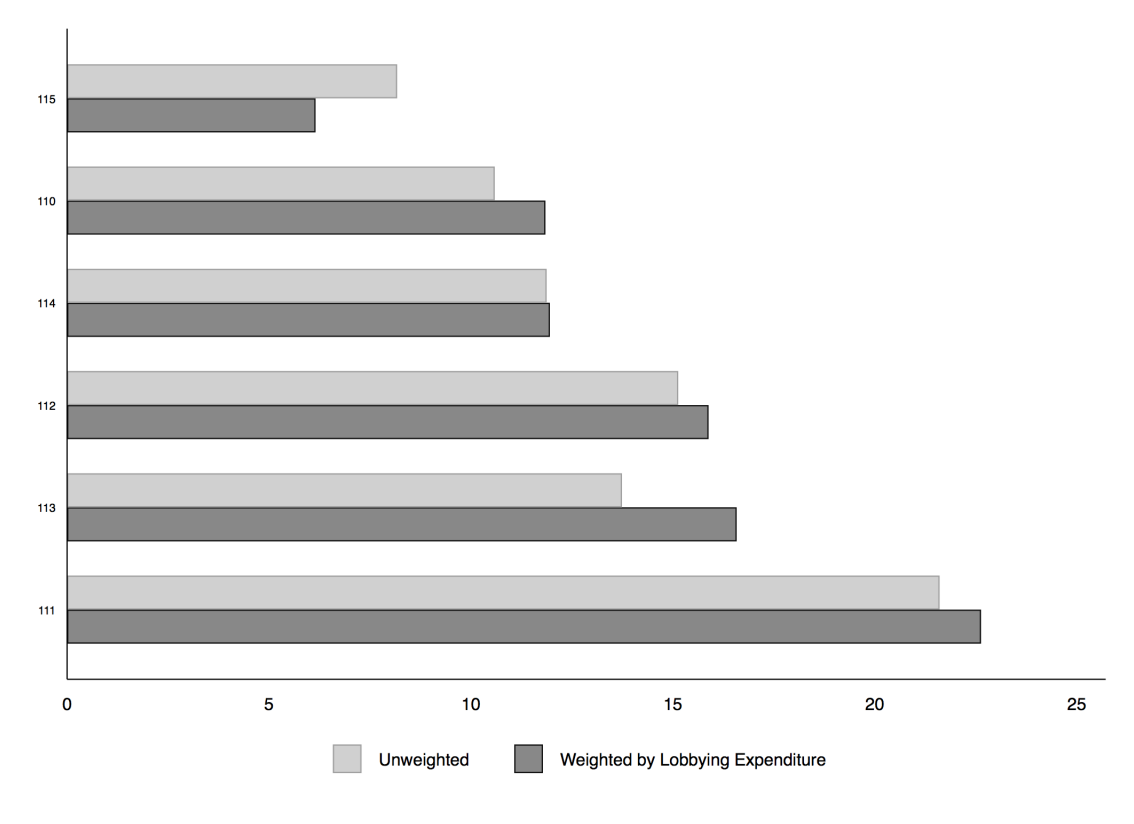

Figure IV.5: **Distribution of Lobbying Activity Across Congress**: This figure presents the distribution of lobbying firms (red) and the share of lobbying expenditure (blue) across congress for the 2008-2018 sample.

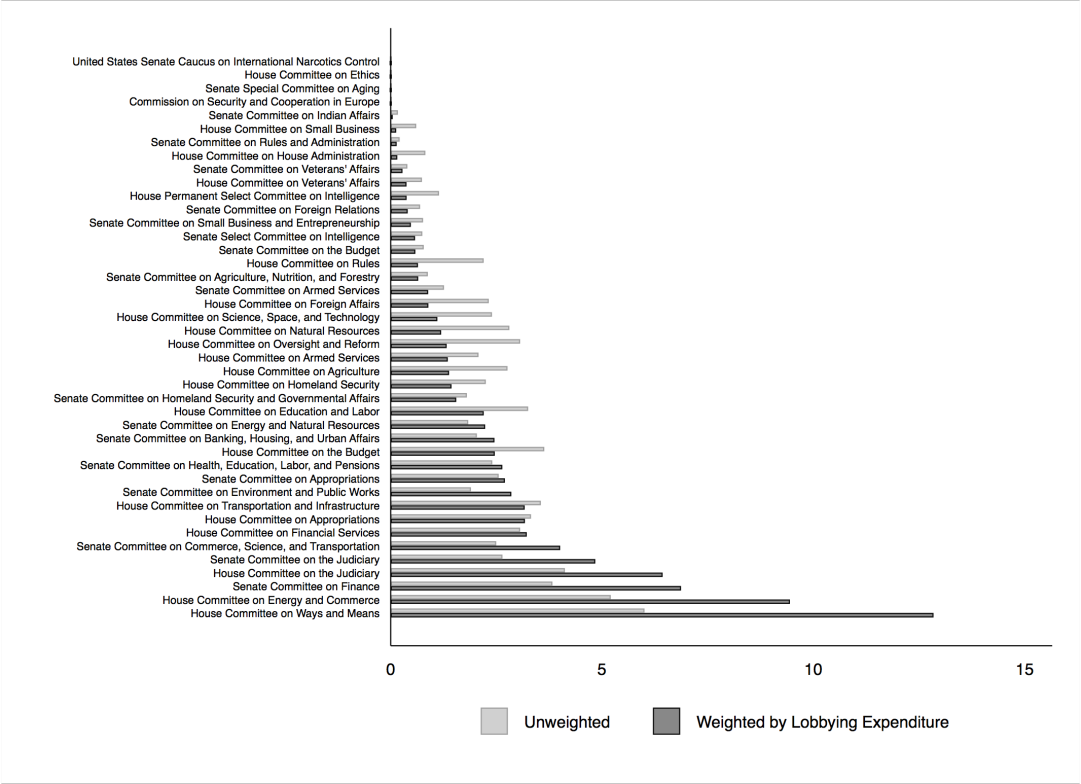

Figure IV.6: **Distribution of Lobbying Activity Across Committees**: This figure presents the distribution of lobbying firms (red) and the share of lobbying expenditure (blue) across committees for the 2008-2018 sample.

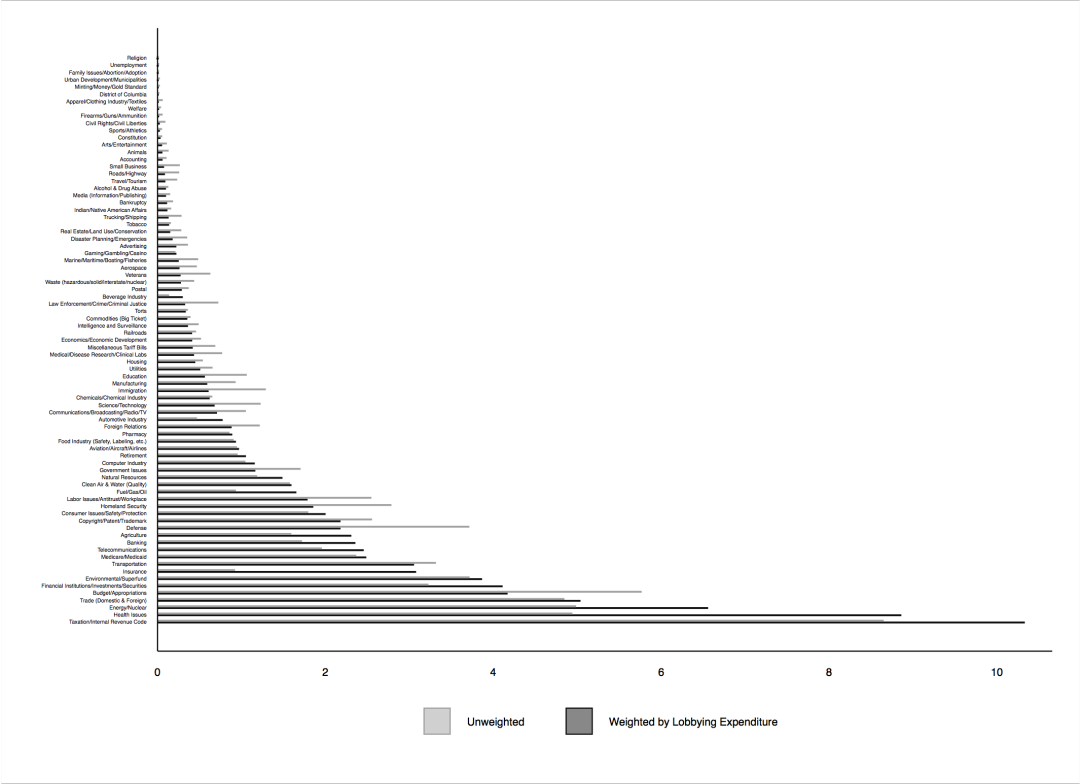

Figure IV.7: **Distribution of Lobbying Activity Across Lobbying Issues**: This figure presents the distribution of lobbying firms (red) and the share of lobbying expenditure (blue) across lobbying issues for the 2008-2018 sample.

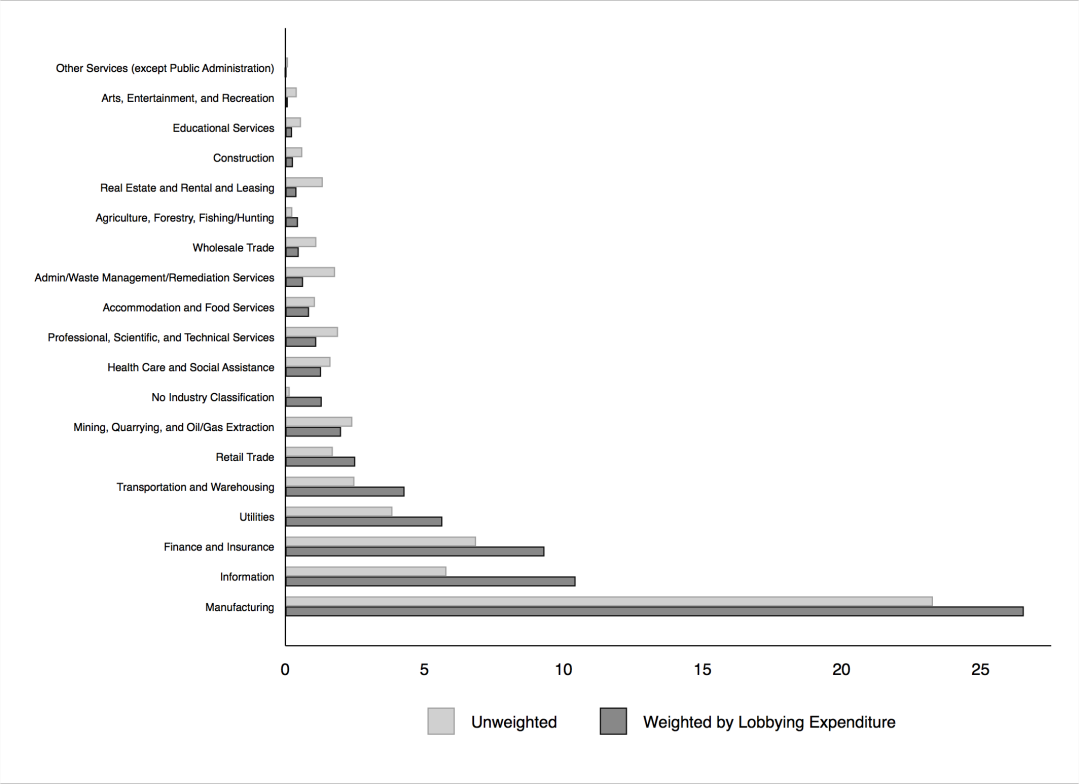

Figure IV.8: **Distribution of Lobbying Activity Across Industries**: This figure presents the distribution of lobbying firms (red) and the share of lobbying expenditure (blue) across 2-digit Naics industries for the 2008-2018 sample.

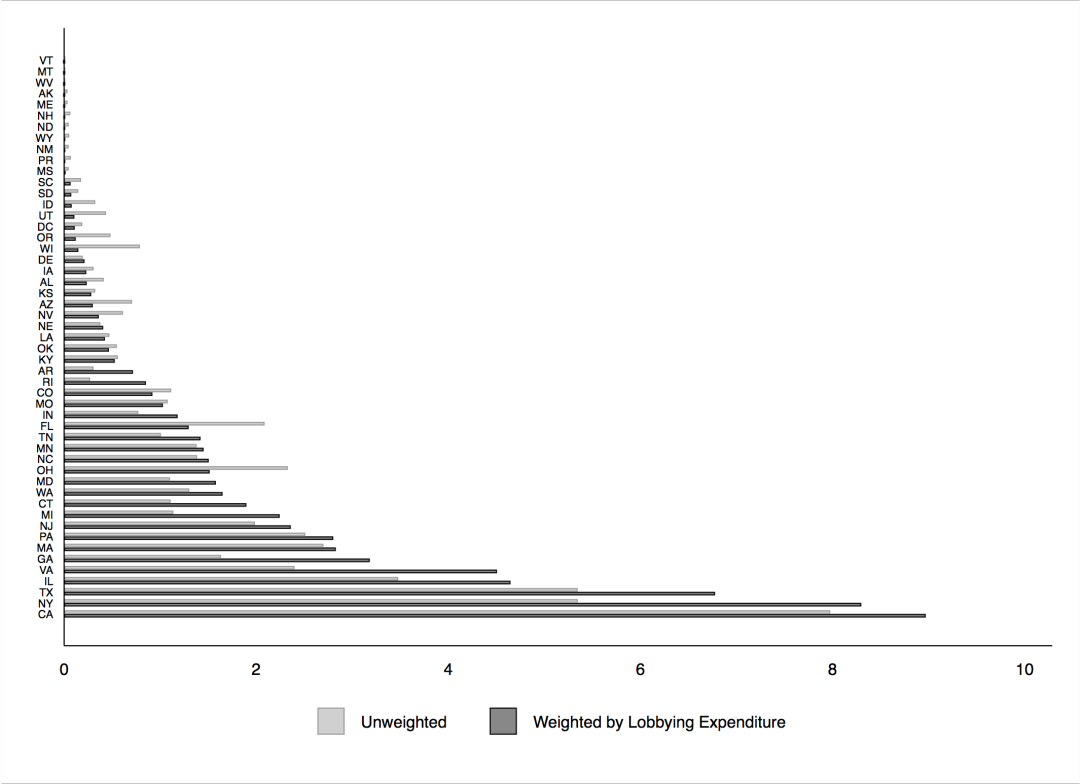

Figure IV.9: **Distribution of Lobbying Activity Across States**: This figure presents the distribution of lobbying firms (red) and the share of lobbying expenditure (blue) across states for the 2008-2018 sample.

V Reduced Form Analysis

In this appendix we present evidence on (i) robustness to the weights used to define the instrument, (i) the first stage of the IV strategy, (iii) the effect of the first stage on other political dimensions, and (iv) descriptive statistics on the distribution of changes of the instrument.

A Robustness of Weights of Shift-Share Instrument in Second Stage

In this subsection we present robustness evidence to the IV strategy implemented in Section III of the main text. We present two types of robustness. The first, varies the timing of the weights used in the instrument to weight the relevance of committees for firms. Table V.1 presents the results. In the benchmark, we used the committee weights that are lagged one period before we committee membership changes. We repeat the benchmark result in the top panel of Table V.1. The middle and bottom panel of this table uses weights lagged two and three years, respectively. One can see that the results are largely robust to this variation. The second robustness, uses weights defined by lobbying expenditure instead of the number of bills that a firm lobbies on committees.[11] Table V.2 shows the main results using weights with lobbying expenditure in $t-1$, $t-2$ and $t-3$. The positive correlation in the OLS and causal effect in the IV also holds with this type of weights. Furthermore, the direction of the bias works in the same way as with weights using the number of bills.

[11] Note that the dataset does not have information of direct lobbying expenditure on each committee. Instead, we use the overall lobbying expenditure divided by the number of committees the firms lobbies on, i.e., the average lobbying expenditure by firms across committees.

	Log Sales		Log VA		Log Profits		Log Capital-Payroll Ratio	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Log Lobby	0.0484	0.240	0.0197	0.147	0.0401	0.327	0.0116	0.0570
	(0.0128)	(0.0715)	(0.00793)	(0.0559)	(0.0127)	(0.0847)	(0.00790)	(0.0518)
N	9180	9180	5851	5851	6284	6284	7572	7572
Firm and Year FE	✓	✓	✓	✓	✓	✓	✓	✓
State-Year FE	✓	✓	✓	✓	✓	✓	✓	✓
Sector-Year FE	✓	✓	✓	✓	✓	✓	✓	✓
Model	OLS	IV	OLS	IV	OLS	IV	OLS	IV
Sample	Post 2007	Post 2007	Post 2007	Post 2007	Post 2007	Post 2007	Post 2007	Post 2007
Weight Lag		nBills, t-2		nBills, t-2		nBills, t-2		nBills, t-2
Mean DV	7.74	7.74	6.99	6.99	6.15	6.15	.19	.19
SD DV	2.27	2.27	1.87	1.87	1.91	1.91	1.65	1.65
SD IV	2.03	2.03	2.04	2.04	2.02	2.02	2.04	2.04

	Log Sales		Log VA		Log Profits		Log Capital-Payroll Ratio	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Log Lobby	0.0484	0.266	0.0197	0.245	0.0401	0.364	0.0116	0.0429
	(0.0128)	(0.0709)	(0.00793)	(0.0873)	(0.0127)	(0.123)	(0.00790)	(0.0511)
N	9180	9180	5851	5851	6284	6284	7572	7572
Firm and Year FE	✓	✓	✓	✓	✓	✓	✓	✓
State-Year FE	✓	✓	✓	✓	✓	✓	✓	✓
Sector-Year FE	✓	✓	✓	✓	✓	✓	✓	✓
Model	OLS	IV	OLS	IV	OLS	IV	OLS	IV
Sample	Post 2007	Post 2007	Post 2007	Post 2007	Post 2007	Post 2007	Post 2007	Post 2007
Weight Lag		nBills, t-3		nBills, t-3		nBills, t-3		nBills, t-3
Mean DV	7.74	7.74	6.99	6.99	6.15	6.15	.19	.19
SD DV	2.27	2.27	1.87	1.87	1.91	1.91	1.65	1.65
SD IV	2.03	2.03	2.04	2.04	2.02	2.02	2.04	2.04

Table V.1: **Different Timing of Weights for Second Stage of IV:** This table presents the OLS and IV between lobbying expenditures and firms economic outcomes. It shows robustness to Table 1 of the main text by using different committee weights. It presents robustness using weights from $t-2$ and $t-3$ (relative to the baseline estimates that uses weights from $t-1$). Profits are defined as sales minus wage bills, capital expenditures and intermediate input expenditures. All regressions have firm, year, sector-year and state-year fixed effects. Standard errors are double clustered at firm and year level.

	Log Sales		Log VA		Log Profits		Log Capital-Payroll Ratio	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Log Lobby	0.0484	0.198	0.0197	0.130	0.0401	0.215	0.0116	0.0397
	(0.0128)	(0.0702)	(0.00793)	(0.0467)	(0.0127)	(0.0782)	(0.00790)	(0.0591)
N	9180	9180	5851	5851	6284	6284	7572	7572
Firm and Year FE	✓	✓	✓	✓	✓	✓	✓	✓
State-Year FE	✓	✓	✓	✓	✓	✓	✓	✓
Sector-Year FE	✓	✓	✓	✓	✓	✓	✓	✓
Model	OLS	IV	OLS	IV	OLS	IV	OLS	IV
Sample	Post 2007	Post 2007	Post 2007	Post 2007	Post 2007	Post 2007	Post 2007	Post 2007
Weight Lag		lobby, t-2		lobby, t-2		lobby, t-2		lobby, t-2
Mean DV	7.74	7.74	6.99	6.99	6.15	6.15	.19	.19
SD DV	2.27	2.27	1.87	1.87	1.91	1.91	1.65	1.65
SD IV	2.03	2.03	2.04	2.04	2.02	2.02	2.04	2.04

	Log Sales		Log VA		Log Profits		Log Capital-Payroll Ratio	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Log Lobby	0.0484	0.262	0.0197	0.258	0.0401	0.273	0.0116	0.0906
	(0.0128)	(0.0716)	(0.00793)	(0.0885)	(0.0127)	(0.122)	(0.00790)	(0.0641)
N	9180	9180	5851	5851	6284	6284	7572	7572
Firm and Year FE	✓	✓	✓	✓	✓	✓	✓	✓
State-Year FE	✓	✓	✓	✓	✓	✓	✓	✓
Sector-Year FE	✓	✓	✓	✓	✓	✓	✓	✓
Model	OLS	IV	OLS	IV	OLS	IV	OLS	IV
Sample	Post 2007	Post 2007	Post 2007	Post 2007	Post 2007	Post 2007	Post 2007	Post 2007
Weight Lag		lobby, t-3		lobby, t-3		lobby, t-3		lobby, t-3
Mean DV	7.74	7.74	6.99	6.99	6.15	6.15	.19	.19
SD DV	2.27	2.27	1.87	1.87	1.91	1.91	1.65	1.65
SD IV	2.03	2.03	2.04	2.04	2.02	2.02	2.04	2.04

Table V.2: **Different Value of Weights for Second Stage of IV:** This table presents the OLS and IV between lobbying expenditures and firms economic outcomes. It shows robustness to Table 1 of the main text, using different committee weights. It defines the weights in terms of lobbying expenditure instead of the number of bills a firm lobbies on a committee. It presents robustness using weights from $t-2$ and $t-3$ (relative to the baseline estimates that uses weights from $t-1$). Profits are defined as sales minus wage bills, capital expenditures and intermediate input expenditures. All regressions have firm, year, sector-year and state-year fixed effects. Standard errors are double clustered at firm and year level.

B First Stage

Table V.3 presents the first stage of the second stage results presented in Table 1 of the main text. We run the following specification:

$$y_{jt} = \alpha + \beta z_{jt} + \gamma_j^F + \gamma_t^T + \gamma_{s(j)t}^S + \gamma_{i(j)t}^I + \varepsilon_{jt}$$

were y_{jt} is lobbying expenditure of firm j at year t, z_{jt} is the instrument and $(\gamma_j^F, \gamma_t^T, \gamma_{s(j)t}^S, \gamma_{i(j)t}^I)$ are firm, time, state-time and industry-time fixed effects, respectively.

Across specifications, the instrument has a positive effect on lobbying expenditure and the F-stat is sufficiently large. A positive effect of the instrument on lobbying expenditure is not mechanic. This is due to the feature that the instrument shifts the market value of lobbying. This leads to a substitution and a scale effect. If the value of lobbying is larger, firms could substitute towards other activities and lobby less, given the size of the firm. This is the substitution effect. But the firm also gets bigger, which leads

to spending more in all activities, including lobbying. This is the scale effect. Our results highlight that the scale effect dominates the substitution effect.

In our main specifications, the weights of the instrument are build on the number of bills that a firm lobbies on a committee in $t-1$. Here we explore two robustness to that: (i) we define the weights in $t-2$ and $t-3$ (Table V.4), and (ii) we define the weights using average lobbying expenditure done in a committee (Table V.5). The main results are robust to these variations of the definition of the weights.

	Log Sales	Log VA	Log Profits	Log Capital-Payroll Ratio
	(1)	(2)	(3)	(4)
Z	6.719	6.436	6.683	6.329
	(1.514)	(1.833)	(1.670)	(1.517)
N	9180	5851	6284	7572
Firm and Year FE	✓	✓	✓	✓
State-Year FE	✓	✓	✓	✓
Sector-Year FE	✓	✓	✓	✓
Model	OLS	OLS	OLS	OLS
F-Stat	19.70	12.30	16	17.40
Sample	Post 2007	Post 2007	Post 2007	Post 2007
Weight Lag	nBills, t-1	nBills, t-1	nBills, t-1	nBills, t-1
Mean DV	-1.19	-1.24	-1.13	-1.23
SD DV	2.03	2.04	2.02	2.04
SD IV	.02	.02	.02	.02

Table V.3: **First Stage of Benchmark IV Specification:** This table presents the first stage of the benchmark results of the IV strategy presented in Table 1 of the main text. The specification has on the left-hand side lobbying expenditure at the firm-time level and the right-hand side the instrument. Column 1-4 presents the result for different second stages since the sample depends on the outcomes of the second stage. All regressions have firm, year, sector-year and state-year fixed effects. The weights of the instrument are defined using the number of bills that a firm lobbied on committees at $t-1$. Standard errors are double clustered at firm and year level.

	Log Sales	Log VA	Log Profits	Log Capital-Payroll Ratio
	(1)	(2)	(3)	(4)
Z	5.920	5.284	5.687	5.155
	(1.552)	(1.927)	(1.693)	(1.607)
N	9180	5851	6284	7572
Firm and Year FE	✓	✓	✓	✓
State-Year FE	✓	✓	✓	✓
Sector-Year FE	✓	✓	✓	✓
Model	OLS	OLS	OLS	OLS
F-Stat	14.60	7.500	11.30	10.30
Sample	Post 2007	Post 2007	Post 2007	Post 2007
Weight Lag	nBills, t-2	nBills, t-2	nBills, t-2	nBills, t-2
Mean DV	-1.19	-1.24	-1.13	-1.23
SD DV	2.03	2.04	2.02	2.04
SD IV	.02	.02	.02	.02

	Log Sales	Log VA	Log Profits	Log Capital-Payroll Ratio
	(1)	(2)	(3)	(4)
Z	4.840	4.262	4.665	4.163
	(1.038)	(1.227)	(1.067)	(1.121)
N	9180	5851	6284	7572
Firm and Year FE	✓	✓	✓	✓
State-Year FE	✓	✓	✓	✓
Sector-Year FE	✓	✓	✓	✓
Model	OLS	OLS	OLS	OLS
F-Stat	21.80	12.10	19.10	13.80
Sample	Post 2007	Post 2007	Post 2007	Post 2007
Weight Lag	nBills, t-3	nBills, t-3	nBills, t-3	nBills, t-3
Mean DV	-1.19	-1.24	-1.13	-1.23
SD DV	2.03	2.04	2.02	2.04
SD IV	.02	.02	.02	.02

Table V.4: **Different Timing of Weights for First Stage of IV:** This table presents robustness of the first stage of the benchmark results of the IV strategy presented in Table 1 of the main text. The robustness is implemented in terms of the timing of the definition of the weights used to build the shift-share instrument. The specification has on the left-hand side lobbying expenditure at the firm-time level and the right-hand side the instrument. Column 1-4 presents the result for different second stages since the sample depends on the outcomes of the second stage. All regressions have firm, year, sector-year and state-year fixed effects. The weights of the instrument are defined using the number of bills that a firm lobbied on committees at $t-2$ and $t-3$ (relative to the baseline that uses weights defined at $t-1$). Standard errors are double clustered at firm and year level.

	Log Sales	Log VA	Log Profits	Log Capital-Payroll Ratio
	(1)	(2)	(3)	(4)
Z	5.739	5.884	6.031	5.305
	(1.414)	(1.953)	(1.625)	(1.550)
N	9180	5851	6284	7572
Firm and Year FE	✓	✓	✓	✓
State-Year FE	✓	✓	✓	✓
Sector-Year FE	✓	✓	✓	✓
Model	OLS	OLS	OLS	OLS
F-Stat	16.50	9.100	13.80	11.70
Sample	Post 2007	Post 2007	Post 2007	Post 2007
Weight Lag	lobby, t-2	lobby, t-2	lobby, t-2	lobby, t-2
Mean DV	-1.19	-1.24	-1.13	-1.23
SD DV	2.03	2.04	2.02	2.04
SD IV	.01	.01	.02	.01

	Log Sales	Log VA	Log Profits	Log Capital-Payroll Ratio
	(1)	(2)	(3)	(4)
Z	4.501	4.363	4.714	3.939
	(0.992)	(1.217)	(1.123)	(1.058)
N	9180	5851	6284	7572
Firm and Year FE	✓	✓	✓	✓
State-Year FE	✓	✓	✓	✓
Sector-Year FE	✓	✓	✓	✓
Model	OLS	OLS	OLS	OLS
F-Stat	20.60	12.90	17.60	13.90
Sample	Post 2007	Post 2007	Post 2007	Post 2007
Weight Lag	lobby, t-3	lobby, t-3	lobby, t-3	lobby, t-3
Mean DV	-1.19	-1.24	-1.13	-1.23
SD DV	2.03	2.04	2.02	2.04
SD IV	.01	.01	.01	.01

Table V.5: **Different Type of Weights for First Stage of IV:** This table presents robustness of the first stage of the benchmark results of the IV strategy presented in Table 1 of the main text. The robustness is implemented in terms of the variable in defining the weights used to build the shift-share instrument. The specification has on the left-hand side lobbying expenditure at the firm-time level and the right-hand side the instrument. Column 1-4 presents the result for different second stages since the sample depends on the outcomes of the second stage. All regressions have firm, year, sector-year and state-year fixed effects. The weights of the instrument are defined using lobbying expenditure on committees at $t-2$ and $t-3$ (relative to the baseline that uses weights defined at $t-1$). Standard errors are double clustered at firm and year level.

C First Stage Effect on Other Political Dimensions

In this section we present evidence of the effect of the instrument on other political dimensions. We run the following specification:

$$y_{jt} = \alpha + \beta z_{jt} + \gamma_j^F + \gamma_t^T + \gamma_{s(j)t}^S + \gamma_{i(j)t}^I + \varepsilon_{jt} \tag{24}$$

were y_{jt} is a political characteristic of firm j at year t, z_{jt} is the instrument and $(\gamma_j^F, \gamma_t^T, \gamma_{s(j)t}^S, \gamma_{i(j)t}^I)$ are firm, time, state-time and industry-time fixed effects, respectively. In other words, this is the same specification of the first stage but using other political variables on the left-hand side rather than lobbying expenditure.

Table V.6 presents the result. Column 1 replicates the benchmark first stage.[12] Column 2, 3, 4 and 5 shows that an increase in the instrument increases the number of reports, the number of issues, the number of bills and the number of committees that the firm lobbied on. This evidence provides potential mechanisms of how the first stage affects outcomes in the second stage. These results highlight that when the value of firms' political connections in Congress increases, they increase lobbying activity across multiple dimensions simultaneously. This stresses how important the value of these connections are in Congress for these firms.

Column 6 of Table V.6 shows that the instruments also increases the likelihood of doing lobbying inhouse. This result can be rationalized if there is a fixed cost of insourcing lobbying, if the value of lobbying increases sufficiently enough, then it becomes profitable to insource lobby.

Table V.7-V.8 presents robustness to Table V.6 by varying the variables used to define the weights in building the shift-share instrument. Table V.7 uses the number of bills lobbied on each committee at $t-2$ and $t-3$ rather than at $t-1$ (which is the benchmark specification). Table V.8 uses average lobbying expenditure spent on each committee at $t-1$, $t-2$ and $t-3$ rather than using the number of bills lobbied on each committee (which is the benchmark specification). Our main results are robust to these robustness exercises.

Finally, we look at the effect of the instrument on a different political dimension of firms influence on politicians: campaign contributions. We run the same specification as in Equation (24), but now we use variables related to campaign contribution behavior, such as the total campaign contribution given by firms to politicians, the number of candidates a firm supports with campaign contributions and whether the firm make campaign contributions. Table V.9-V.10 presents the result across different strategies in defining the weights for the shift-share instrument. Across specifications of these two tables, the instrument increases campaign contributions and the number of candidates that firms support. It does not increase robustly the likelihood of contributing at all. This evidence is consistent the idea that our instrument shifts not only the returns to lobbying but also the returns to campaign contributions. It also suggest some role for mismeasurement in our IV specification. The instrument not only changes the first stage outcome, but other mechanisms of how firms can influence politicians, such as campaign contributions. This is consistent with previous results in the literature showing that instruments that shift the value of political connections affect firms expenditures on politicians such as corporate philanthropy (Bertrand et al., 2020). Thus, our instrument shifts not only lobbying expenditure but other mechanisms of influence of firms on politicians, therefore justifying even further the significant second stage results.

[12]The results are slightly different compared to our benchmark results in Table V.3 since the sample used is different. Furthermore, since we are not conditioning on having an economic characteristic in the second stage, our sample size is larger and represents all firms for which we have lobbying reports. This sample size is larger than the one for which we have information in Compustat.

	Lobbying Expense	Number of Reports	Number of Issues	Number of Bills	Number of Committees	Inhouse
	(1)	(2)	(3)	(4)	(5)	(6)
Z	6.923	4.175	3.604	27.38	19.30	0.972
	(1.149)	(0.569)	(0.485)	(3.691)	(2.415)	(0.198)
N	15800	15800	15800	15800	15800	15800
Firm and Year FE	✓	✓	✓	✓	✓	✓
State-Year FE	✓	✓	✓	✓	✓	✓
Sector-Year FE	✓	✓	✓	✓	✓	✓
Sample	Post 2007	Post 2007	Post 2007	Post 2007	Post 2007	Post 2007
Weight Lag	nBills, t-1	nBills, t-1	nBills, t-1	nBills, t-1	nBills, t-1	nBills, t-1
Mean DV	-1.57	1.62	1.1	1.42	.96	.33
SD DV	2.35	.95	.91	1.79	1.17	.39
SD IV	.02	.02	.02	.02	.02	.02

Table V.6: **Politics Behavior and the Value of Firms' Political Connections:** This table presents the results of the specification of Equation (24), where y_{jt} is lobbying expenditure (Column 1), number of reports (Column 2), number of issues (Column 3), number of bills (Column 4), number of committees (Column 5) that firm j lobbied on at year t. Column 6 reports the effect of the instrument on a dummy variable of whether the firm insources lobbying. All regressions have firm, year, sector-year and state-year fixed effects. The weights of the instrument are defined using the number of bills that a firm lobbied on committees at $t-1$. Standard errors are double clustered at firm and year level.

	Lobbying Expense	Number of Reports	Number of Issues	Number of Bills	Number of Committees	Inhouse
	(1)	(2)	(3)	(4)	(5)	(6)
Z	4.914	3.703	2.987	24.39	17.38	0.845
	(1.217)	(0.512)	(0.480)	(4.408)	(2.998)	(0.195)
N	15032	15032	15032	15032	15032	15032
Firm and Year FE	✓	✓	✓	✓	✓	✓
State-Year FE	✓	✓	✓	✓	✓	✓
Sector-Year FE	✓	✓	✓	✓	✓	✓
Sample	Post 2007	Post 2007	Post 2007	Post 2007	Post 2007	Post 2007
Weight Lag	nBills, t-2	nBills, t-2	nBills, t-2	nBills, t-2	nBills, t-2	nBills, t-2
Mean DV	-1.52	1.65	1.1	1.48	1.01	.33
SD DV	2.31	.95	.91	1.8	1.18	.39
SD IV	.01	.01	.01	.01	.01	.01

	Lobbying Expense	Number of Reports	Number of Issues	Number of Bills	Number of Committees	Inhouse
	(1)	(2)	(3)	(4)	(5)	(6)
Z	3.994	2.913	2.642	21.83	15.88	0.811
	(1.053)	(0.447)	(0.463)	(3.740)	(2.575)	(0.192)
N	14208	14208	14208	14208	14208	14208
Firm and Year FE	✓	✓	✓	✓	✓	✓
State-Year FE	✓	✓	✓	✓	✓	✓
Sector-Year FE	✓	✓	✓	✓	✓	✓
Sample	Post 2007	Post 2007	Post 2007	Post 2007	Post 2007	Post 2007
Weight Lag	nBills, t-3	nBills, t-3	nBills, t-3	nBills, t-3	nBills, t-3	nBills, t-3
Mean DV	-1.48	1.68	1.1	1.56	1.05	.33
SD DV	2.28	.95	.9	1.82	1.19	.4
SD IV	.01	.01	.01	.01	.01	.01

Table V.7: **Politics Behavior and the Value of Firms' Political Connections: Different Timing of Weights of Instrument** This table presents robustness to the results of the specification of Equation (24), where y_{jt} is lobbying expenditure (Column 1), number of reports (Column 2), number of issues (Column 3), number of bills (Column 4), number of committees (Column 5) that firm j lobbied on at year t. Column 6 reports the effect of the instrument on a dummy variable of whether the firm insources lobbying. All regressions have firm, year, sector-year and state-year fixed effects. The weights of the instrument are defined using the number of bills that a firm lobbied on committees at $t-2$ and $t-3$ (relative to the baseline estimates that use weights defined at $t-1$). Standard errors are double clustered at firm and year level.

	Lobbying Expense	Number of Reports	Number of Issues	Number of Bills	Number of Committees	Inhouse
	(1)	(2)	(3)	(4)	(5)	(6)
Z	5.361	3.693	3.211	23.52	16.64	0.867
	(1.085)	(0.467)	(0.476)	(4.498)	(3.067)	(0.210)
N	15032	15032	15032	15032	15032	15032
Firm and Year FE	✓	✓	✓	✓	✓	✓
State-Year FE	✓	✓	✓	✓	✓	✓
Sector-Year FE	✓	✓	✓	✓	✓	✓
Sample	Post 2007	Post 2007	Post 2007	Post 2007	Post 2007	Post 2007
Weight Lag	lobby, t-2	lobby, t-2	lobby, t-2	lobby, t-2	lobby, t-2	lobby, t-2
Mean DV	-1.52	1.65	1.1	1.48	1.01	.33
SD DV	2.31	.95	.91	1.8	1.18	.39
SD IV	.01	.01	.01	.01	.01	.01

	Lobbying Expense	Number of Reports	Number of Issues	Number of Bills	Number of Committees	Inhouse
	(1)	(2)	(3)	(4)	(5)	(6)
Z	4.150	2.891	2.725	21.12	15.21	0.862
	(0.973)	(0.413)	(0.455)	(3.784)	(2.605)	(0.198)
N	14208	14208	14208	14208	14208	14208
Firm and Year FE	✓	✓	✓	✓	✓	✓
State-Year FE	✓	✓	✓	✓	✓	✓
Sector-Year FE	✓	✓	✓	✓	✓	✓
Sample	Post 2007	Post 2007	Post 2007	Post 2007	Post 2007	Post 2007
Weight Lag	lobby, t-3	lobby, t-3	lobby, t-3	lobby, t-3	lobby, t-3	lobby, t-3
Mean DV	-1.48	1.68	1.1	1.56	1.05	.33
SD DV	2.28	.95	.9	1.82	1.19	.4
SD IV	.01	.01	.01	.01	.01	.01

Table V.8: **Politics Behavior and the Value of Firms' Political Connections: Different Types of Weights of Instrument** This table presents robustness to the results of the specification of Equation (24), where y_{jt} is lobbying expenditure (Column 1), number of reports (Column 2), number of issues (Column 3), number of bills (Column 4), number of committees (Column 5) that firm j lobbied on at year t. Column 6 reports the effect of the instrument on a dummy variable of whether the firm insources lobbying. All regressions have firm, year, sector-year and state-year fixed effects. The weights of the instrument are defined using average lobbying expenditure that a firm lobbied on committees at $t-2$ and $t-3$ (relative to the baseline estimates that use weights defined at $t-1$). Standard errors are double clustered at firm and year level.

	Campaign Contribution	Number Candidates	Whether Contributed
	(1)	(2)	(3)
Z	2.296	2.761	0.243
	(0.867)	(0.811)	(0.150)
N	5088	5118	15032
Firm and Year FE	✓	✓	✓
State-Year FE	✓	✓	✓
Sector-Year FE	✓	✓	✓
Sample	Post 2007	Post 2007	Post 2007
Weight Lag	nBills, t-2	nBills, t-2	nBills, t-2
Mean DV	10.42	2.98	.34
SD DV	1.47	1.32	.47
SD IV	.02	.02	.01

	Campaign Contribution	Number Candidates	Whether Contributed
	(1)	(2)	(3)
Z	2.031	2.596	0.201
	(0.933)	(0.787)	(0.185)
N	4818	4846	14208
Firm and Year FE	✓	✓	✓
State-Year FE	✓	✓	✓
Sector-Year FE	✓	✓	✓
Sample	Post 2007	Post 2007	Post 2007
Weight Lag	nBills, t-3	nBills, t-3	nBills, t-3
Mean DV	10.43	2.97	.34
SD DV	1.47	1.32	.47
SD IV	.02	.02	.01

Table V.9: **Campaign Contributions and the Value of Firms' Political Connections: Different Timing of Weights of Instrument** This table presents the effect of our instrument on variables of campaign contribution following the specification of Equation (24), where y_{jt} is overall campaign contribution of firm j at year t (Column 1), number of candidates the firm supports at t (Column 2) and whether the firm supports any candidate (Column 3). All regressions have firm, year, sector-year and state-year fixed effects. The weights of the instrument are defined using the number of bills that a firm lobbied on committees at $t-2$ and $t-3$ (relative to the baseline estimates that use weights defined at $t-1$). Standard errors are double clustered at firm and year level. *** p<0.01, ** p<0.05, * p<0.1

	Campaign Contribution	Number Candidates	Whether Contributed
	(1)	(2)	(3)
Z	2.879	3.119	0.259
	(1.032)	(0.906)	(0.148)
N	5088	5118	15032
Firm and Year FE	✓	✓	✓
State-Year FE	✓	✓	✓
Sector-Year FE	✓	✓	✓
Sample	Post 2007	Post 2007	Post 2007
Weight Lag	lobby, t-2	lobby, t-2	lobby, t-2
Mean DV	10.42	2.98	.34
SD DV	1.47	1.32	.47
SD IV	.02	.02	.01
	Campaign Contribution	Number Candidates	Whether Contributed
	(1)	(2)	(3)
Z	1.854	2.278	0.263
	(0.948)	(0.838)	(0.200)
N	4818	4846	14208
Firm and Year FE	✓	✓	✓
State-Year FE	✓	✓	✓
Sector-Year FE	✓	✓	✓
Sample	Post 2007	Post 2007	Post 2007
Weight Lag	lobby, t-3	lobby, t-3	lobby, t-3
Mean DV	10.43	2.97	.34
SD DV	1.47	1.32	.47
SD IV	.01	.01	.01

Table V.10: **Campaign Contributions and the Value of Firms' Political Connections: Different Timing of Weights of Instrument** This table presents the effect of our instrument on variables of campaign contribution following the specification of Equation (24), where y_{jt} is overall campaign contribution of firm j at year t (Column 1), number of candidates the firm supports at t (Column 2) and whether the firm supports any candidate (Column 3). All regressions have firm, year, sector-year and state-year fixed effects. The weights of the instrument are defined using average lobbying expenditure that a firm lobbied on committees at $t-2$ and $t-3$ (relative to the baseline estimates that use weights defined at $t-1$). Standard errors are double clustered at firm and year level. *** p<0.01, ** p<0.05, * p<0.1

D Dynamics of Lobbying Effect on Firm Size

This subsection evaluates the dynamics of the effect of the lobbying on firm economic characteristics. We implement a Jorda local projection strategy:

$$y_{it+h} = \beta + \alpha_h \log l_{it} + \alpha_y y_{it-1} + \epsilon_{it+h}, \tag{25}$$

where $h = \{1, 2, 3, 4\}$, y_{it+h} is an outcome of firm i, h years after the lobbying shock, l_{it} is lobbying expenditure of firm i at year t. We implement this strategy with an OLS model and also with the IV strategy by instrumenting $\log l_{it}$ with our shift-share instrument. Figure V.1 presents both OLS and IV versions of $\hat{\alpha}_h$ for three different outcomes y_{it+h} of Equation (25): log sales, log value added and log capital-payroll ratio. It shows a positive and increasing effect of lobbying on firm sales when estimating with OLS. With the IV strategy, the effect is stronger in the short run, but vanishes after two years. It also shows that the OLS significantly underestimates the lobbying effect in the short run (α_1). The effect on value added are not statistically different from zero when estimating with OLS but strongly positive

when estimating with IV. This highlights again that OLS underestimates the effect of lobbying. It also shows that the OLS underestimates the dynamic effect of lobbying in the sense that the effect on value added is increasing until 2 years after the shock and the effect is still significant 3 years after the shock. This stress the sluggish response of firm economic outcomes to changes in firms' value of political connections. Finally, the OLS strategy shows a positive effect of lobbying on the capital-payroll ratio in the short run but not a statistically significant effect with the IV strategy, highlighting that lobbying seems to have a stronger effect on firm size rather than the composition of inputs.

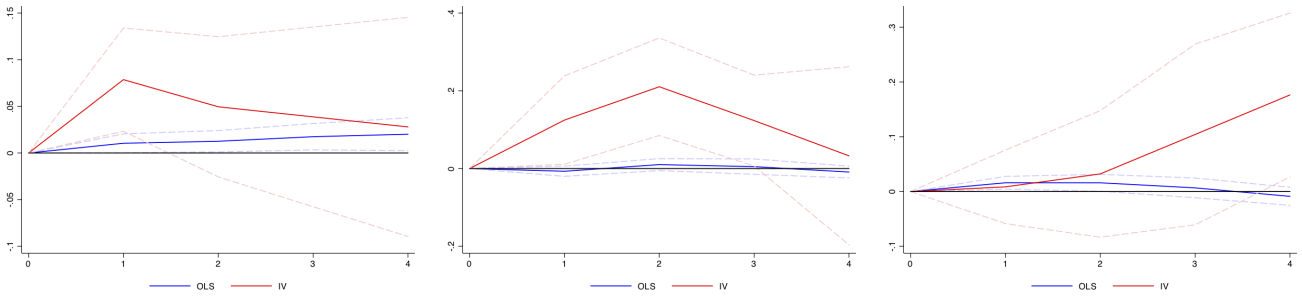

Figure V.1: **The Effect of Lobbying on Firm Dynamics:** This figure presents the OLS (blue) and IV (red) estimates of α_h from Equation (25). Panel (a), (b) and (c) shows this for y_{it+h} being log sales, log value added and log capital-payroll ratio, respectively. The IV strategy uses the shift-share instrument built with weights of the number of bills a firms lobbied on a committee in $t-1$. Dashed lines represent confidence intervals with 95 percent of confidence.

E Distribution of Instrument Changes

In this subsection we document how the variation of the instrument is distributed across different economic and political dimensions. The goal is to understand in which dimension of the data is the source of variation in our instrument. Note that the only way the instrument varies over time for a given firm is if the politician connected to that firm changes committee into or from a committee that is relevant for the firm. In particular, we document the share of firms for which the instrument varies over time across: congress (Figure V.2), committees (Figure V.3), lobbying issues (Figure V.4), industry (Figure V.5) and state (Figure V.6). The main takeaway of these figures is that they show that there is heterogeneity in how many firms present changes of the instrument over time but overall there does not seem to be any congress, committee, lobbying issue, industry or state dominating the variation.

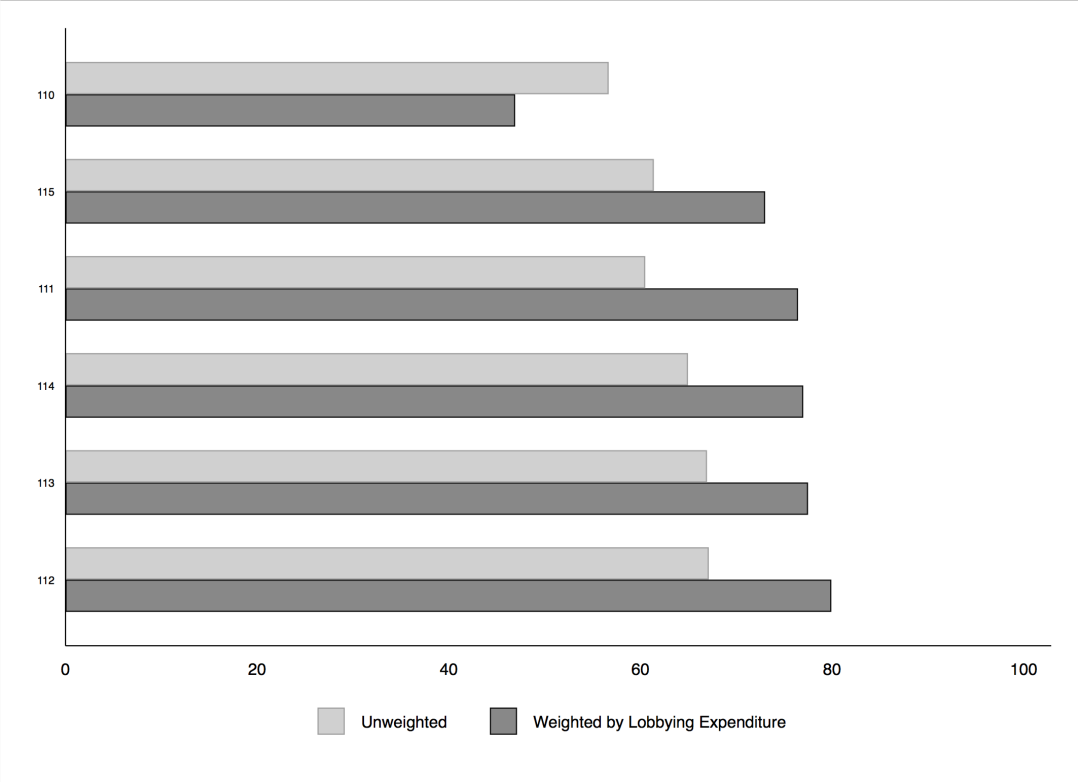

Figure V.2: **Share of Lobbying with Variation in Instrument at Congress Level**: This figure presents the share of lobbying firms (red) and the share of lobbying expenditure (blue) within each congress that experience firm-level changes in the instrument over time.

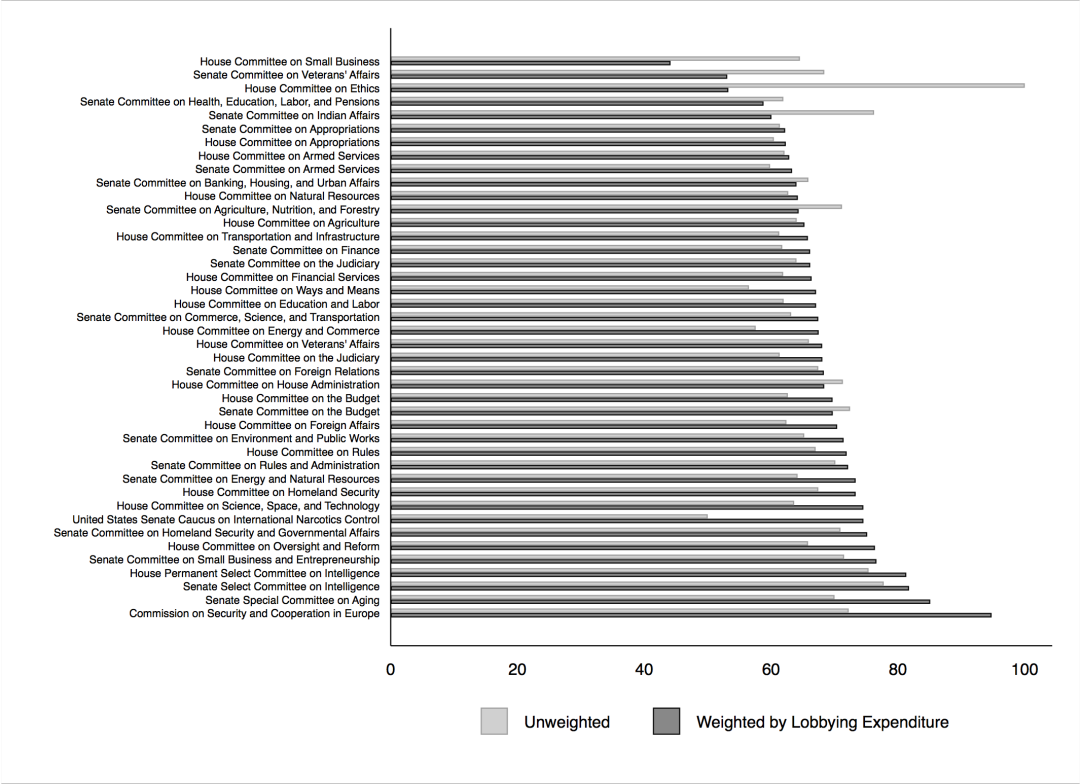

Figure V.3: **Share of Lobbying with Variation in Instrument at Committee Level**: This figure presents the share of lobbying firms (red) and the share of lobbying expenditure (blue) within each standing committee that experience firm-level changes in the instrument over time.

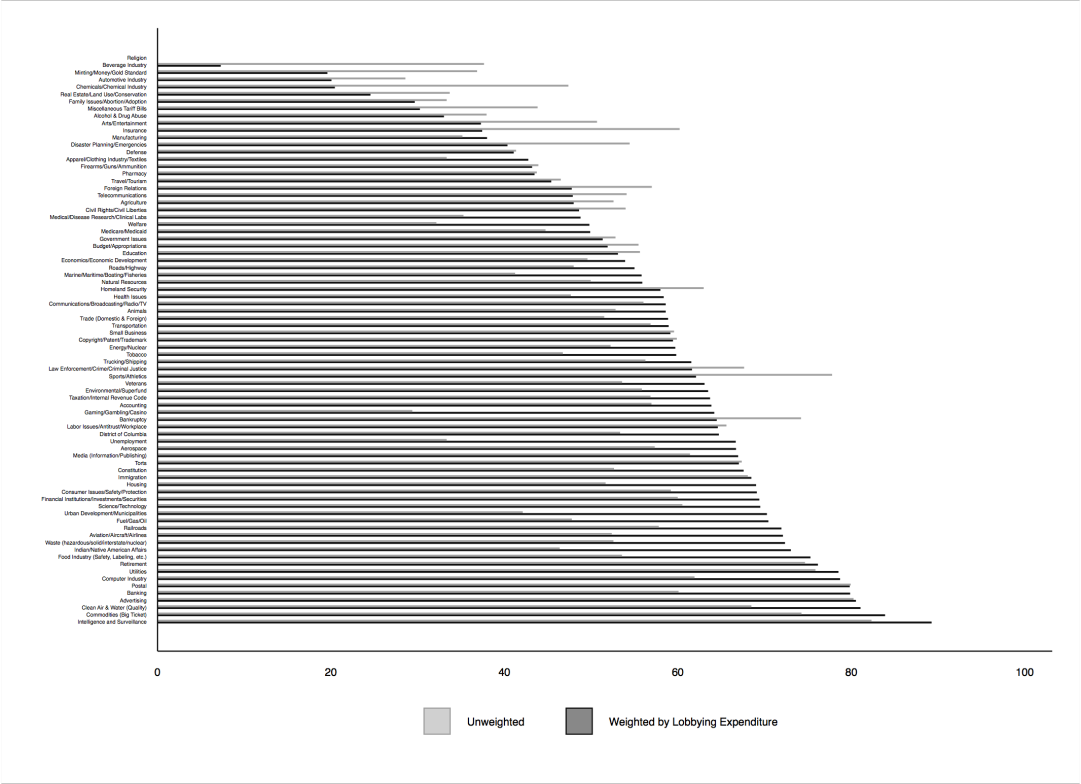

Figure V.4: **Share of Lobbying with Variation in Instrument at Issue Level**: This figure presents the share of lobbying firms (red) and the share of lobbying expenditure (blue) within each lobbying issue that experience firm-level changes in the instrument over time.

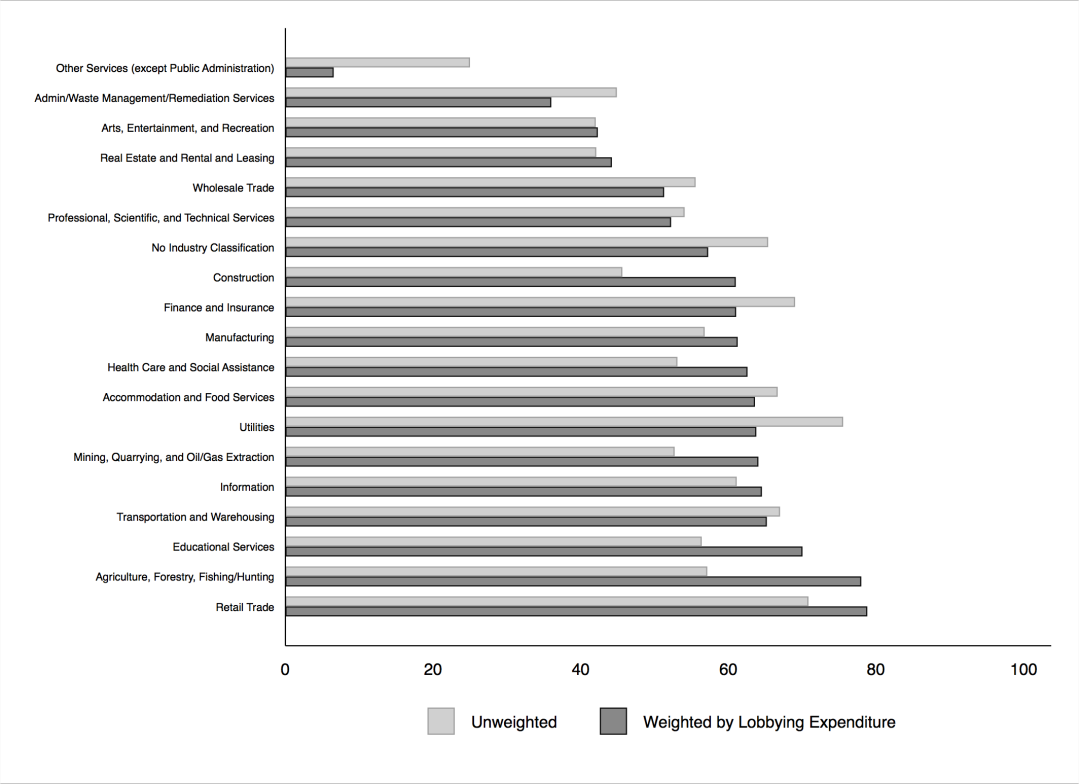

Figure V.5: **Share of Lobbying with Variation in Instrument at Industry Level**: This figure presents the share of lobbying firms (red) and the share of lobbying expenditure (blue) within each industry that experience firm-level changes in the instrument over time.

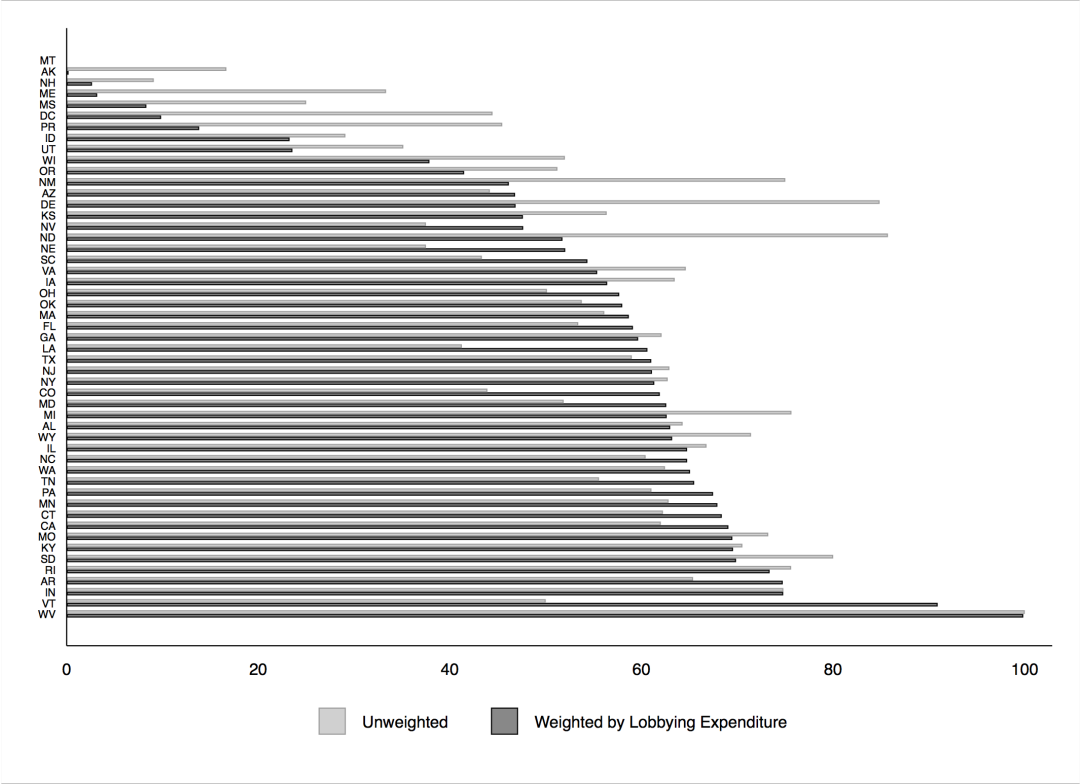

Figure V.6: **Share of Lobbying with Variation in Instrument at State Level**: This figure presents the share of lobbying firms (red) and the share of lobbying expenditure (blue) within each state that experience firm-level changes in the instrument over time.

VI Structural Estimation

We implement a SMM algorithm in four steps. First, the model is simulated with a given value for Θ. Second, we use the simulation of the model to produce a set of moments, which we stack into the vector $\hat{m}(\Theta)$. Third, we produce the same set of moments with data and stack this into the vector m. Finally, we compute an objective function to evaluate the deviations of the simulated moments from the data moments, $d(\Theta) = m - \hat{m}(\Theta)$. If this difference is not below some threshold, the algorithm is repeated with different parameter values until a minimum is reached. The estimation procedure is based on the following moment condition:

$$\mathbb{E}\left[d(\Theta_0)\right] = 0,$$

where Θ_0 is the true value of Θ. Thus, the algorithm for $\hat{\Theta}$ is

$$\hat{\Theta} = \underset{\Theta}{\operatorname{argmin}}\{d(\Theta)'\mathbf{W}d(\Theta)\},$$

where $\mathbf{W}$ is a weighting matrix which is the generalized inverse of the estimated variance-covariance matrix of the moments calculated from the data.[13]

We document descriptive statistics of the estimated version of the model. First, Figure VI.1 documents the marginal distributions of the primitives $\phi = \{\phi^P, \phi^D, \phi^L\}$.

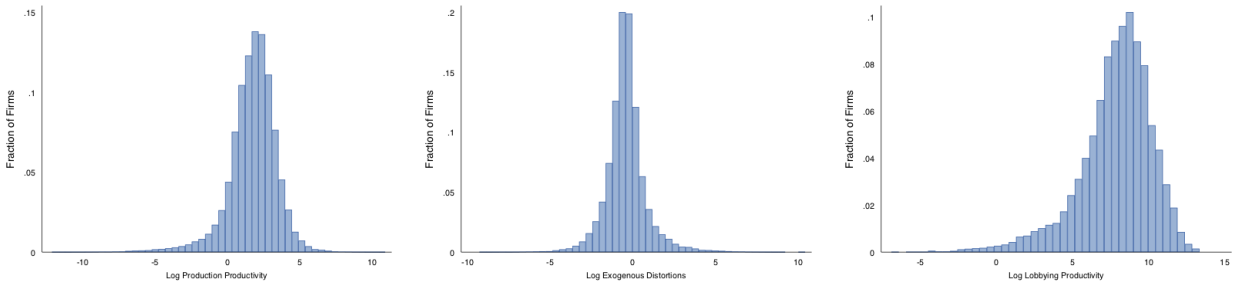

Figure VI.1: **Marginal Distributions of Firms' Primitives:** This figure presents the marginal distribution of each of the primitives estimated from the model. The figures show that the primitives follow a log-normal distribution.

Second, we document the fit of the estimated version of the model to two sets of moments from the data: the percentage of firms that lobby in each sector, and the distribution of the number of firms across sectors. In both cases, the figures demonstrate a relatively good fit of the model.

[13] We assume the identity matrix, which effectively weights all the moments equally.

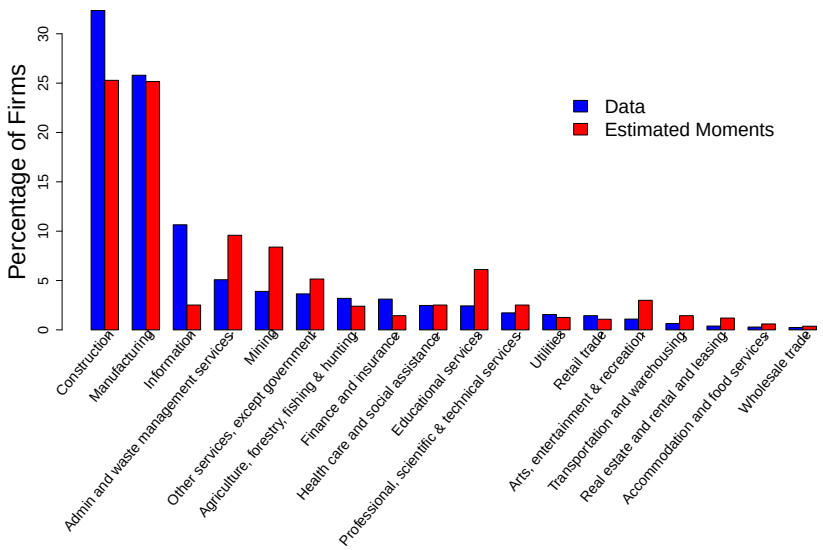

Figure VI.2: **Number of Firms Share Fit**: This figure shows the distribution of the number of firms across sectors, both in the data and the one simulated from the estimated version of the model.

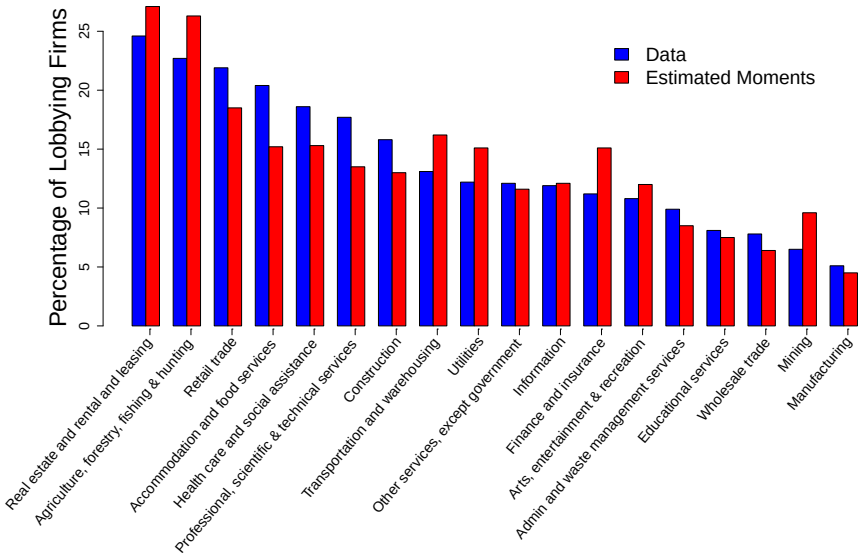

Figure VI.3: **Lobbying Share Fit**: This figure shows the percentage of firms in each sector that lobby, both in the data and the one simulated from the estimated version of the model.

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