

Policy Uncertainty and Demand for Revolving-Door Lobbyists

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Abstract

Interest groups spend large sums of money hiring lobbyists often as a form of insurance against the risk of harmful policy change. This theory of lobbying as political insurance, however, needs systematic testing. Previous experience serving in government makes lobbyists more valuable as providers of political insurance. The insurance theory of lobbying thus points to an empirical link between policy uncertainty and interest groups' demand for these "revolving-door lobbyists" with previous government experience. I examine this link using panel analysis of lobbying activity by companies in four economic sectors over an eleven-year period. It draws on a sector-specific and time-variant measure of policy uncertainty based on analyzing companies' discussions of policy risks in annual 10-K filings submitted to the U.S. Securities and Exchange Commission. In all four sectors companies' preference for revolvers increases in response to policy uncertainty relative to conventional lobbyists.

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Why do interest groups spend money hiring lobbyists? A major goal of lobbying is thought to be insuring against the risks of policy change (LaPira and Thomas 2017). Researchers have subjected this theory of lobbying as political insurance to few empirical tests mainly because it is difficult to measure policy uncertainty at different points in time. In this paper, I use a measure of policy uncertainty perceived by for-profit companies in four major economic sectors for such a test. It tests an expectation stemming from the insurance theory with respect to lobbyists with previous experience working in government: The lobbying activity of these “revolving-door lobbyists” should be positively associated with sector-wide policy uncertainty. Empirical analysis yields strong evidence for this expectation.

By counting policy-related words from risk factor discussions contained in annual 10-K filings submitted by companies to the U.S. Securities and Exchange Commission, I estimate a measure of policy uncertainty which both corresponds to specific sectors of the economy and changes over time. As such, this measure describes lobbying clients’ assessments as to the kind of policy uncertainty most relevant to the determination of their political strategies, including how to lobby. By merging companies’ perceptions of policy risks extracted from their 10-K filings from 2006 to 2016 to lobbying records, I conduct two sets of panel analysis of the relationship between policy uncertainty and revolving-door lobbying in the four economic sectors that spend the most money on lobbying. This analysis uncovers strong evidence for the insurance theory of lobbying. First, it shows that revolvers made up a greater share of all active lobbyists in these four sectors when companies perceived greater policy uncertainty. Second, switching perspectives from clients to lobbyists, it shows that revolvers obtained lobbying business from more companies in each sector when perceived policy uncertainty went up. Interestingly, the analysis shows only mixed evidence that overall lobbying, not just that involving revolvers, increased when policy uncertainty was high. Companies’ effort to defend against uncertainty was manifested quite exclusively through the hiring of revolvers.

1 Lobbying as Political Insurance and Revolving-Door Lobbyists

Lobbying is often a defensive enterprise. Interest groups often lobby in order to prevent harmful policy change rather than persuade government to enact change (Baumgartner et al. 2009; Drutman 2015; LaPira and Thomas 2017). According to Baumgartner et al. (2009), in spite of the often complex and multi-dimensional nature of public policy, conflicts over policy tend to have a simple structure. On the host of issues the authors surveyed, organized interests with different preferences tended to coalesce into two sides, with one side defending the status quo and the other favoring some kind of change. Many interest groups choose to defend the status quo first because it usually already reflects existing biases in the pressure system and thus conforms to the groups' preferences, and second because effecting policy change is a much more demanding effort. The policy process is marked by a strong status quo bias produced by forces working in concert. Frictions in the policy process that resist policy change mean that interest groups have a much easier time defending the status quo than challenging it (Baumgartner et al. 2009).

LaPira and Thomas (2017) formulate such a theory of lobbying as insurance against policy uncertainty in order to explain the dominance of lobbyists who used to work in government. The rise of these "revolving-door lobbyists" is one of the most salient recent developments in American interest group politics. The lobbying data, to be described in greater detail later, show that the share of revolvers among all active Washington lobbyists steadily rose from less than 10 percent in 1998 to almost half in 2016. The proportion of former members of Congress that decide to become lobbyists has also increased over time (Lazarus, McKay and Herbel 2016). According to LaPira and Thomas (2017), revolvers owe their domination over conventional lobbyists above all to their knowledge about the policy process, which is valuable to interest groups trying to head off political risks. This explanation based on process knowledge adds to a body of work suggesting that lobbying

clients value revolvers' relative strength in expertise on particular policy or political connections (Salisbury et al. 1989; Bertrand, Bombardini and Trebbi 2014; i Vidal, Draca and Fons-Rosen 2012; LaPira and Thomas 2017; Kang and You 2016; McCrain 2018).

That revolvers' process knowledge makes them more helpful to interest groups in their endeavor to insure against policy uncertainty can certainly go a long way in explaining their demonstrable advantage over conventional lobbyists. More systematically testing it, however, poses some challenges. The kind of policy uncertainty that exists in LaPira and Thomas's (2017) theory is a general feature of the overall political environment. The two main causes of increasing uncertainty they set forth - declining congressional capacity that lawmaking requires and the rise of strong parties in government in a polarized era - are fundamental and mostly irreversible institutional developments. Secular rather than dynamic and fluctuating, policy uncertainty for good reason does not feature in their empirical analysis as an independent variable.

But policy uncertainty does fluctuate, and the policy environment contains uncertainty-creating elements that are more dynamic than declining lawmaking capacity and heightening partisanship. Policy changes that the government considers at any point in time may create policy uncertainty to relevant constituencies. Notably, President Trump's recent rhetoric suggesting regulatory reform aimed at restricting prescription drug prices forced a major pharmaceutical manufacturer into a guessing game.¹ To explicitly evaluate the theorized but untested link between policy uncertainty and the intensity with which organized interests engage in revolving-door lobbying, therefore, it is essential to accurately capture the fluctuating policy uncertainty facing them. A good measure should accordingly have a high level of granularity cross-sectionally and longitudinally. Cross-sectionally, it should describe uncertainty in the policy environment most relevant to each interest group at any given time

¹Bertha Coombs, "Humana turns to game theory for new Medicare pricing as insurers juggle Trump rebate uncertainty," CNBC, March 22, 2019, <https://www.cnbc.com/2019/03/22/humana-turns-to-game-theory-for-new-medicare-price-structure.html>.

rather than uncertainty facing some other interest group with disparate goals. Longitudinally, it should be sensitive to over-time change in policy uncertainty facing a given interest group.

The measure that I use in this study for policy uncertainty based on companies' discussions of policy risks in annual 10-K reports satisfies both criteria. The level of policy uncertainty demonstrably varies among economic sectors and, within each sector, changes from year to year. Panel analysis drawing on this measure presents evidence for a positive within-sector correlation between policy uncertainty and revolving-door lobbying that holds strong for all sectors in the data. This result is consistent with recent work by Ban, Palmer and Schneer (2019). They show that lobbyists, especially revolvers, are able to generate more lobbying revenue during times of high policy uncertainty. Ban, Palmer and Schneer (2019) adopt a different strategy than mine for measuring policy uncertainty, however. Based on the economic policy uncertainty index (EPU) developed by Baker, Bloom and Davis (2016), they come up with a catch-all measure of system-wide policy uncertainty that assumes that all interest groups consider one universal policy environment when making lobbying decisions. They summarize the EPU index into yearly means and then coarsen it further by classifying years as simply having low or high policy uncertainty based on how each yearly mean compares with the median of the entire time period.

2 Hypotheses

The insurance theory of lobbying should manifest itself in clients' preference for revolving-door lobbyists to conventional lobbyists. Utilizing the sector specificity of the measure of policy uncertainty, I design empirical analysis to test the two following hypotheses. From mutually complementary analytic perspectives, I test whether demand for revolvers increases with policy uncertainty. The first hypothesis states this expectation from the perspective of business, and the second from that of lobbyists.

H1 The share of revolving-door lobbyists among all lobbyists increases in an economic sector when its policy environment becomes more uncertain.

H2 Revolving-door lobbyists' number of lobbying clients increases more strongly in response to policy uncertainty than that of conventional lobbyists.

As the hypotheses approach the same underlying theory from two empirical angles, they necessitate data sets with different units of analysis. Testing **H1** requires panel analysis at the level of sector-year combinations. The research question can be stated as the following panel equation.

For sector i in year t ,

$$\% \text{ Revolvers}_{it} = \beta \cdot \text{Uncertainty}_{it} + \mathbf{X}_{it}^T \mathbf{b} + \alpha_i + \eta_t + \epsilon_{it},$$

where $\% \text{ Revolvers}_{it}$ is the dependent variable measuring the share of revolvers among all contracted lobbyists in sector i in year t , and Uncertainty_{it} is the policy uncertainty facing sector i in year t . \mathbf{X}_{it} is a vector of sector-variant and time-variant control variables. Also included are fixed effects for sectors and years, denoted by α_i and η_t , respectively. Finally, ϵ_{it} is the residual in each observation not explained by the explanatory variables and fixed effects combined.

Hypothesis **H2** concerns individual lobbyists' career trajectories in response to policy uncertainty depending on their revolver status. My approach to testing it is using a data set containing unique combinations of lobbyist, sector, and year. While I proceed from balanced panel data containing one observation for every lobbyist-sector-year combination, I modify the data on this basis by removing two types of observations: those linking a lobbyist to a sector she never worked in and those where the lobbyist has not made her first appearance in the overall data. In other words, I presume that lobbyists are not available for clients and therefore should be removed from the data prior to their earliest lobbying transaction. The research question can be mathematically stated as follows:

For lobbyist i in sector j in year t ,

$$\begin{aligned} \text{No. Clients}_{ijt} = & \beta_1 \cdot \text{Revolver}_i + \beta_2 \cdot \text{Uncertainty}_{jt} + \beta_3 \cdot \text{Revolver}_i \times \text{Uncertainty}_{jt} \\ & + \mathbf{X}_{jt}^T \mathbf{b} + \alpha_j + \eta_t + \epsilon_{ijt} \end{aligned}$$

The dependent variable is the number of lobbying clients within sector j that hired lobbyist i in year t . On the right hand side, Revolver_i is a binary variable indicating whether lobbyist i was a revolver, Uncertainty_{jt} describes that sector's policy uncertainty in that year, and $\text{Revolver}_i \times \text{Uncertainty}_{jt}$ is their interaction. Similar with the first equation, this equation contains a vector of sector-variant and time-variant covariates, \mathbf{X}_{jt} . It controls for two sets of fixed effects - for each sector and each year - denote by α_j and η_t , respectively. Idiosyncrasies for each lobbyist-sector-year combination are contained in the error term, ϵ_{ijt} . Taken together, the two equations examine from different analytic angles the degree to which policy uncertainty corresponds positively to companies' demand for revolvers over conventional lobbyists in different economic sectors.

3 Data

Both data sets discussed above have several components: lobbying activity (particularly its revolving-door component), business's perceptions of policy uncertainty, and corporate finance.

3.1 The Business Lobby and the Revolving Door

Like most studies on lobbying in American national politics, this study relies on lobbying data made available under the Lobbying Disclosure Act of 1995, compiled and cleaned by the Center for Responsive Politics. In their entirety, the LDA data begin with lobbying reports

filed in 1998 and continually accrue, but the portion I use starts in 2006 and ends in 2016, the period before 2006 rendered unuseful by the temporal range of my measure of policy uncertainty, to be discussed later. As the LDA data originally list lobbying reports, I first transform them to contain one unique observation for each client-year entry. I further trim the LDA data by keeping only U.S. companies among the universe of lobbying clients found in the Compustat corporate finance data set discussed below.² I also keep only those companies that existed during the entire period as companies must at least exist to spend money lobbying. These steps result in company-year observations involving 1,098 distinct companies - some observations with lobbying activity and others without. Identifying companies across the lobbying and corporate finance data allows me to classify them by economic sector using 3-digit sector codes in the 2017 North American Industry Classification System (NAICS)³.

Information on whether lobbyists had government experience and went through the revolving door comes from the LDA data's "covered position" component. It consists of text entered by lobbyists in free text fields in their LDA forms in order to disclose past government employment in compliance with lobbying regulation.⁴ Having identified revolvers

²I follow a semi-automated procedure to match lobbying clients with U.S. companies. The first step is finding the best match for each client among all companies in the Compustat data based on Levenshtein string distances, a commonly used string metric for measuring the difference between two word strings based on single-character edits (i.e., insertions, deletions, or substitutions) required to change one word string into the other. The second step is human determination of whether each match was correct.

³https://www.census.gov/eos/www/naics/2017NAICS/2017_NAICS_Manual.pdf

⁴Originally in text form, this variable has two known deficiencies, both of which I address somewhat in my variable construction. The first deficiency is that sometimes lobbyists incorrectly thought this field required them to disclose their current positions as lobbyists (e.g. Senior Partner, CEO, Director of Government Affairs) (Drutman and Furnas 2014). I mostly fix this issue by considering only those lobbyists that entered 20 or more characters in the "covered position" field to be revolving-door lobbyists. The second deficiency is

and conventional lobbyists, I count the number of both types in each sector from to year. For these counts, I exclude those companies that lobbied but engaged exclusively in in-house lobbying during this period (i.e., did not hire contract lobbyists at any time). This is a very small group of only 57 of the aforementioned 1,098 U.S. companies that both never went out of existence and lobbied at some point during the eleven years.

3.2 Policy Uncertainty

My measure of policy uncertainty facing economic sectors is based on companies' perceptions as revealed in their annual reports submitted to the government. The U.S. Securities and Exchange Commission requires publicly traded companies to file periodic reports, and among them is the Form 10-K, an annual report intended to give a comprehensive summary of a company's performance. Of interest to this study is the report's "Item 1A - Risk Factors" section, required since 2005, where companies disclose the risk of different events that can potentially harm their performance. Here companies' management discusses at length various risk factors currently and potentially facing them in order to inform shareholders, a source of information that research related to corporate finance has found useful (Campbell et al. 2014; Kravet and Muslu 2013; Gaulin 2017; Huang and Li 2011; Li, Lundholm and Minnis 2013; Beatty, Cheng and Zhang 2018; Duncan and Trieu 2015; Rawte, Gupta and Zaki 2018; Doran and Quinn 2008; Fournaies and Hall 2015). Risks engendered by policy, whether via congressional lawmaking or agency rule-making, rank routinely among the top some lobbyists' deliberate underreporting of previous government employment (LaPira and Thomas 2012). While I have no sure-fire solution to truly address this problem, I take advantage of the fact that lobbyists were given an opportunity to disclose previous government employment every time they filed a lobbying report. I may have addressed the problem of deliberate underreporting to some degree by aggregating all text entered by each lobbyist in all lobbying reports over the years of the LDA data.

categories perceived by management - “legal and regulatory” risks for Campbell et al. (2014), “exposure to regulation” for Fournaies and Hall (2015), and risks imposed by “regulation changes” for Huang and Li (2011).

The salience of policy risks perceived by companies is evident in the 10-K filings used in this study. I measure different sectors’ perceptions of policy uncertainty by looking at how much their member companies discussed the policy environment in the Item 1A sections of their 10-K filings, using an approach of counting key words. This procedure required an initial investment of considerable time even with research assistants. The data include the four sectors that supply the largest number of lobbying clients. In descending order of lobbying activity, these sectors are chemical manufacturing, utilities, computer and electronic product manufacturing, and insurance carriers and related activities, as they are named in full in the NAICS manual. To clarify the two sectors with less informative names, companies in the utilities sector generate, process, or distribute energy and water. Most chemical manufacturing companies produce pharmaceutical and biological products for health use, while a smaller number of companies produce chemical products for generally non-health purposes such as plastics, paint, and fertilizers.⁵

Within roughly equal-sized random samples of companies within each of the Big Four sectors, two research assistants and I download the 10-K filings of those that filed them (only publicly traded companies are required to do so). The resulting overall sample include 46 companies in utilities, 19 in chemical manufacturing, 33 in electronics manufacturing, and 40 in insurance. Mostly following the method adopted by Fournaies and Hall (2015), I count the

⁵My determination of the top four sectors in terms of lobbying is based on the average number of clients in each sector over the years. This ranking is in strong agreement with the Center for Responsive Politics’s ranking of sectors based on lobbying expenditure, available at <https://www.opensecrets.org/lobby/top.php?showYear=a&indexType=i>. Currently, the top four sectors according to the CRP are Pharmaceuticals/Health Products, Insurance, Electric Utilities, and Electronics Manufacturing and Equipment.

percentage of words related to statutory and regulatory policy within the Item 1A sections.⁶ As an example of language discussing policy risks, the Appalachian Power Company stated in its 10-K filing submitted in 2011, with key words in bold, “If any of these projects is canceled for any reason, including our failure to receive necessary **regulatory** approvals and/or siting or environmental permits, we could incur significant cancellation **penalties** under the equipment purchase orders and construction contracts.”

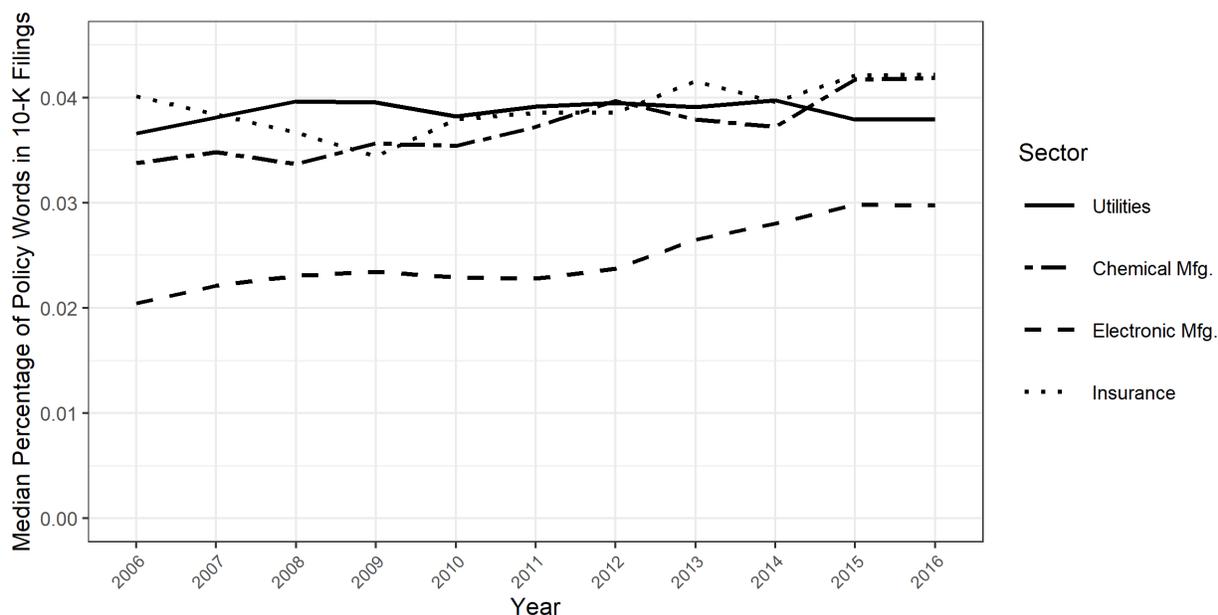
A commonly observed problem with companies’ discussion of risk factors is that management seems to often follow a “boiler plate” approach, starting each year’s filings on the basis of last year’s and only adding to and (less frequently) subtracting from previously used text (Kravet and Muslu 2013). Related to this, I find that companies sometimes undertook idiosyncratic changes in the format of their filings such as the section and subsection structure of the narrative, resulting in a large amount of noise in word counts that cannot be easily addressed by text cleaning procedure. These problems, however, are ameliorated via summarizing - using individual company filings to calculate sector-wide measures of perceived policy risks. For a summary statistic, I adopt the sector median percentage of policy words.⁷ Though a summary of more granular but “noisier” company-level perceptions, this sector-level measure still boasts an attractive temporal granularity and context specificity.

⁶The relevant words and word stems are “govern”, “feder”, “congress”, “agenc”, “court”, “administr”, “commiss”, “legisl”, “legislatur”, “polici”, “penalti”, “fine”, “law”, “regul”, “regulatori”, “zone”, “licen”, “licens”, “licensor”, “oversight”, “complianc”, “compliant”, “noncompli”, “enforc”, “unenforc”, “requir”, “pursuant”, and “protect”. I follow other conventional steps in text analysis: “Stop words” and very sparse words that appear in only 10% or less of all the filing excerpts were removed before counting the key words and word stems. See Appendix A for a full delineation of the process.

⁷While I use sector-wide measures in my main analysis, I show company-level regression analysis, part of which draws on company-level perceptions of policy uncertainty, in Appendix E.

Figure 1 plots the Big Four sectors’ median percentages of policy words in their member companies’ 10-K filings from 2006 to 2016. Three traits stand out: change over time in each sector - occasionally significant change, the relatively low correlation among the four, and some common upward trend over time.

Figure 1: Company Perceptions of Policy Uncertainty in Big Four Lobbying Sectors, 2006-2016



Given that the listed policy words and word stems constitute a small percentage of companies’ discussions of risk factors (never over 5 percent for any sector in the data), changes in their frequency from year to year were oftentimes significant. For example, during the first year or so of the Obama administration before the passage of president’s signature Affordable Care Act in March 2010, policy uncertainty perceived by the insurance sector according to keyword percentages surged from around 3.4 percent to around 3.8 percent of risk discussions. In terms of word counts, this represents a jump from 230 to 302 policy words from 2009 to 2010.⁸ Also notably, over the decade the percentage of policy words increased

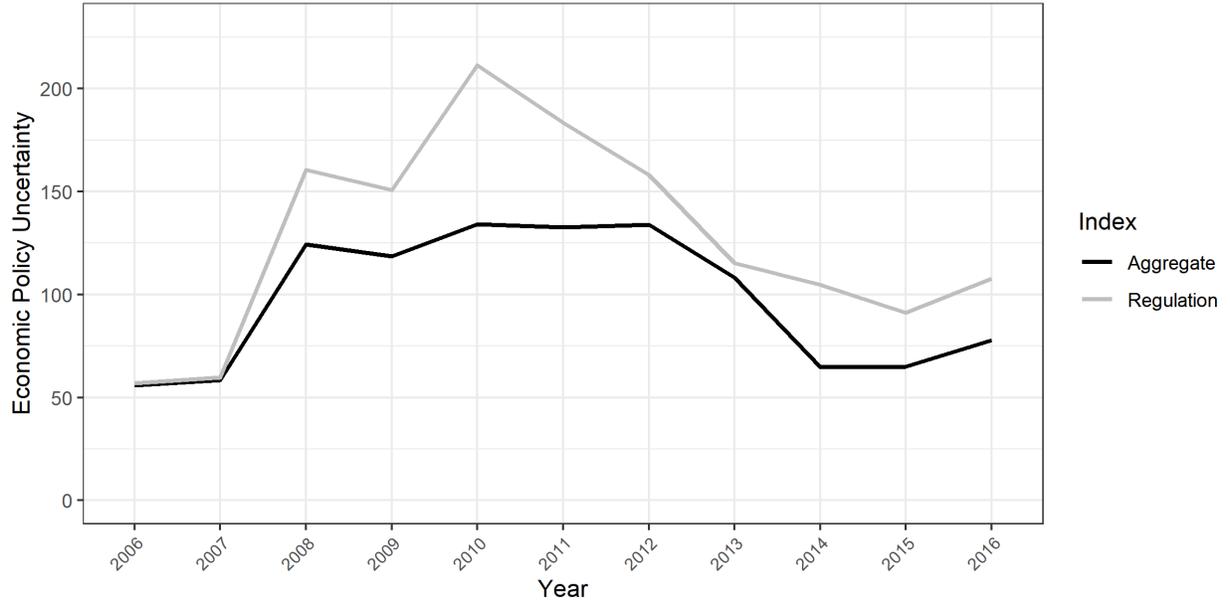
⁸This increase in the number of policy words translates into a percentage change from 3.4 percent to 3.8 percent because the median overall length of risk factor discussions also

from just over 2 percent to almost 3 percent for electronic manufacturing, reflecting a median count of policy words that more than doubled during the period, from 89 to 185.

Lending credence to this measure's ability to register company perceptions of sector-specific policy uncertainty, its value both differs from sector to sector and is not strongly correlated with the economic policy uncertainty index (Baker, Bloom and Davis 2016) used by Ban, Palmer and Schneer (2019). Table 2 plots the latter, displaying the aggregate index and its regulatory component as yearly averages. Table 1 displays a correlation matrix for the sector-specific measure over the eleven years as well as the EPU index. For the most part, the Big Four sectors do not correlate strongly with each other in perceived policy uncertainty. The correlation coefficient between some pairs is close to zero, and that between electronic manufacturing and insurance is negative. That different sectors' perceptions of policy uncertainty did not go in tandem supports the initial motivation for this measure, that the policy environment should best be treated as a context-dependent rather than monolithic concept when possible. Comparing risk perceptions to the EPU index, the correlation coefficient is negative for three of the four sectors. In fact, the EPU index first rose and then fell during this period, as shown in Figure 2, a trend hardly observed in the perception-based measure.

increased from 6,336 words in 2009 to 7,689 words in 2010 for the insurance sector.

Figure 2: Economic Policy Uncertainty Index, 2006-2016



Data Source: Baker, Bloom and Davis (2016)

Table 1: Correlation Matrix of Perceived Policy Uncertainty in Big Four Lobbying Sectors and Economic Policy Uncertainty Index, 2006-2016

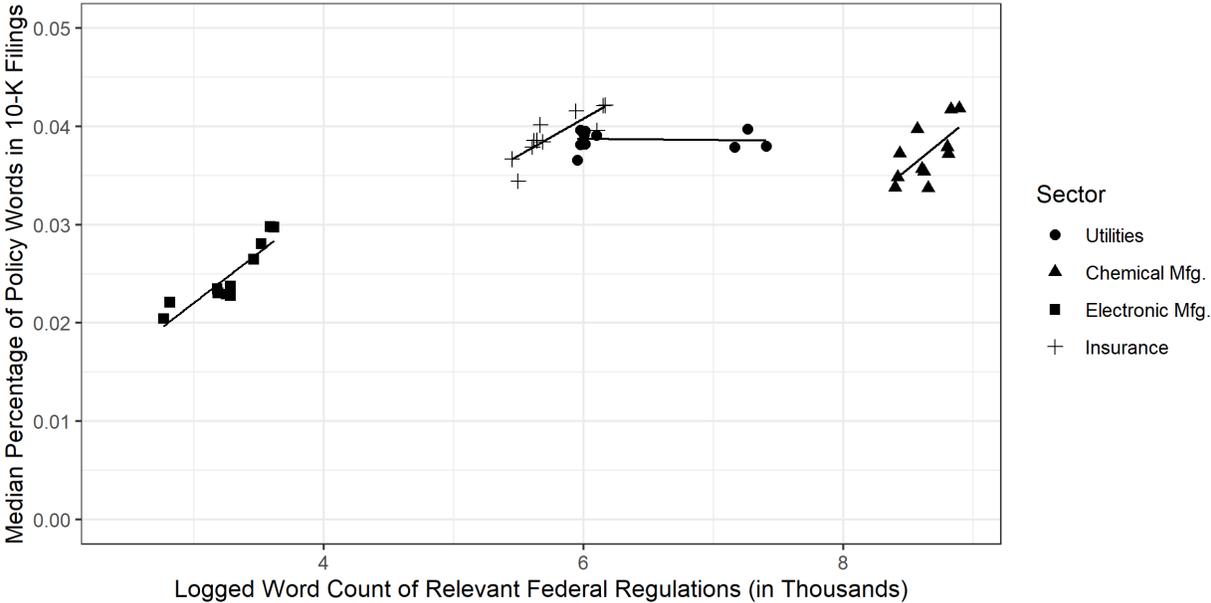
	Utilities	Chemical Mfg.	Electronic Mfg.	Insurance	EPU
Utilities	1	0.828	0.008	0.642	-0.101
Chemical Mfg.	0.828	1	0.110	0.627	-0.299
Electronic Mfg.	0.008	0.110	1	-0.484	0.582
Insurance	0.642	0.627	-0.484	1	-0.527
EPU	-0.101	-0.299	0.582	-0.527	1

For a check on the ability of this perception-based measure of policy uncertainty to reflect the corresponding sector-specific policy environments, I compare the measure with the actual length of federal regulations relevant to each sector. This measure comes from the “RegData US” annual data set created by the Mercatus Center at George Mason University (McLaughlin and Sherouse 2018). By conducting text analysis of the Code of Federal Regulations (CFR), the data set’s creators calculated the relevance of different regulations with respect to each industry, classified using NAICS codes. As each year’s CFR is organized into “titles” and then “parts” corresponding to policy areas, the data set contains the degree to

which these parts and titles are relevant to different industries. I sum up the lengths of all parts of regulations deemed by the data’s creators to be at least 95% relevant to an industry in each year in order to measure the volume of relevant policy that governed it, a stringent threshold of relevance.

Figure 3 plots the Big Four sectors’ median percentages of policy words in company filings against the log-transformed word count of relevant regulations according to “RegData US.” As expected, the two are positively correlated though the utilities sector emerges as an exception, for which company perceptions are statistically uncorrelated with the length of regulations.

Figure 3: Company Perceptions of Policy Uncertainty and Length of Federal Regulations, Big Four Lobbying Sectors



Though not sharing the rise and fall of Baker, Bloom and Davis’s (2016) economic policy uncertainty index, the measure of policy risk perceptions is characterized by a generally upward trend across the Big Four sectors. More often than not, companies gradually devoted increasing portions of their risk factor discussions in 10-K filings to policy risks from year

to year, even as 10-K filings steadily lengthened overall. This trend poses a problem for analyzing how policy uncertainty relates to the intensity of revolving-door lobbying. As both quantities trend upward, their mere correlation with time may manufacture a specious correlation between them even if they are not actually related to each other. To address this concern, I control for year fixed effects and, alternatively, a linear trend in panel regression analysis, controls which prove to not matter for the main findings.

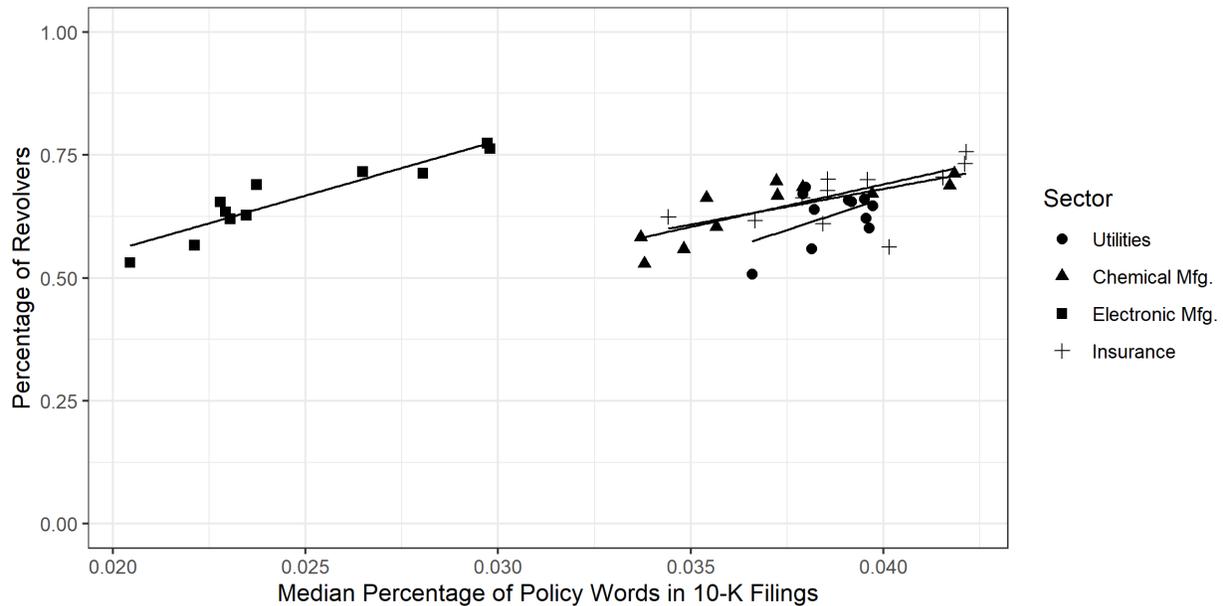
3.3 Corporate Finance

As mentioned earlier, I identify companies in the lobbying data by matching lobbying clients with companies in the Compustat data on corporate finance. I construct three additional variables at the sector-year level by summarizing other company characteristics contained in Compustat as control variables in analysis - the level of market concentration measured by the Herfindahl-Hirschman Index (HHI), the sum of the total assets of all companies, and the total number of companies whether they lobbied or not. The competitiveness of an industry has been shown to matter for its lobbying activity. Bombardini and Trebbi (2012) hypothesize that companies are motivated to lobby collectively through peak associations rather than going it alone in competitive sectors in which products are undifferentiated. I control for sectors' level of concentration to take account of such empirical regularities in lobbying. Sectors' total assets, coupled with the number of companies, serve as a measure of their purchasing power with respect to the costly service of lobbying; wealthier sectors may hire more lobbyists by default simply because they could better afford them. The number of companies in business serves as a similar type of control. The existence of more companies also translates into more potential lobbying clients and more potential contracts for lobbyists, a basic cause of increased lobbying that needs to be taken into account regardless of companies' changing demand for it.

4 Findings

These data sets on companies' lobbying activity, their perceptions of policy uncertainty, and corporate finance combine to form the two sets of panel data for analysis envisioned earlier. To test Hypothesis **H1**, I use panel data unique at the sector-year level to examine the relationship between sector-wide policy uncertainty and revolving-door lobbying. See Appendix B for a table of summary statistics of the variables involved. The data lend strong support to the hypothesis. Across the Big Four sectors, greater policy uncertainty was associated with a greater percentage of revolvers among all actively contracted lobbyists. Plotting the two variables against each other, Figure 4 shows a clear positive association between them across the Big Four sectors. Grouped by sector, the dots represent yearly sector-specific observations. A least-squares best fit line is drawn for each sector.

Figure 4: Company Perceptions of Policy Uncertainty and Revolving-Door Lobbying, Big Four Lobbying Sectors



As discussed earlier and seen again in Figure 4 as the x-axis, sector-wide median percentages of policy words vary considerably from year to year. Percentages of revolvers, shown

on the y-axis, cover even wider ranges. In the electronic manufacturing sector, for example, revolvers constituted a low of just over half of the universe of lobbyists and a high of almost 80 percent in different years over the period, and other sectors are comparable in this respect. As hypothesized, the positive association between policy uncertainty and the percentage of revolvers appears strong and largely universal across the four sectors, as demonstrated by the near-parallel best fit lines.

On its own, the percentage of revolvers in a given sector already embodies companies' preference for revolvers to conventional lobbyists. Nevertheless, this measure alone does not separate two different though not mutually exclusive scenarios. In one, lobbying business flows from conventional lobbyists to revolvers when policy uncertainty increases. In the other, the overall volume of lobbying business grows when policy uncertainty increases, but it falls disproportionately into revolvers' business portfolios. Either scenario or some combination of both may give rise to the correlation being tested. Though not vital to the theory of lobbying as political insurance, it is valuable to examine which scenario better describes reality. To do so, in figures 5 and 6 I plot policy uncertainty against the total number of lobbying clients and total lobbying expenditure in each sector, respectively. The main finding is the absence of consistently positive correlations between both pairs of variables. Hence, the overall "pie" of lobbying was generally no larger when companies perceived high uncertainty. Interestingly, positive slopes exist for lobbying expenses incurred by electronic manufacturing and utilities companies (Figure 6) but not for their client counts (Figure 5), suggesting that lobbying contracts for these two sectors became more expensive on average when their policy environments grew more uncertain.

series of panel regression equations designed for this purpose, all of which have the percentage of revolvers as the dependent variable and sector perceptions of policy uncertainty as the main independent variable. All equations control for ways that sector attributes and time may contribute to an ostensible correlation between them. All equations control for sector fixed effects. Equations 1 and 2 additionally control for year fixed effects and are therefore two-way fixed effects models, and Equation 3 uses a linear time trend to replace year fixed effects to control for the trend problem noted earlier. All equations also control for two lagged terms for the dependent variable, measuring the percentage of revolvers in each sector in each of the two previous years, in order to control for autocorrelation over time in revolving-door lobbying. These lagged terms therefore take account of the noted “stickiness” or path dependency of corporate lobbying (Drutman 2015). Standard errors are clustered by sector. The three variables related to sector-wide corporate finance - sectors’ total assets, degree of market concentration, and the number of companies - serve as additional controls in equations 2 and 3.

Table 2: Linear Regression - Policy Uncertainty and Revolving-Door Lobbying Across Economic Sectors

	<i>Dependent variable:</i>		
	Percentage of Revolving-Door Lobbyists		
	(1)	(2)	(3)
Uncertainty	4.348*** (1.480)	4.471*** (1.325)	2.906*** (1.085)
Total Assets		0.000 (0.000)	0.000 (0.000)
Concentration		-0.0003 (0.001)	0.002 (0.001)
Number of Companies		-0.0001*** (0.00002)	-0.0001*** (0.00001)
Constant	0.214*** (0.072)	0.289*** (0.043)	0.031 (0.063)

Lagged DV	2	2	2
Sector Fixed Effects	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	No
Linear Trend	No	No	Yes
Observations	44	44	44
R ²	0.970	0.974	0.957
Adjusted R ²	0.952	0.954	0.944
χ^2	154.536***	161.185***	138.502***

Note: Standard errors are clustered by sector.

*p<0.1; **p<0.05; ***p<0.01

The positive relationship between policy uncertainty and revolving-door lobbying proves robust to these various model specifications. Across the three equations, the coefficient estimate for policy uncertainty remains strongly statistically significant, fairly stable in magnitude, and practically sizable. According to Equation 2, an increase in the median share of policy words by one percentage point in a sector corresponds on average to an increase in the percentage of revolvers by nearly 4.5 percentage points. In the data collected, the average length of risk factor discussions in companies' 10-K filings is approximately 7,700 words, of which an average of 260 words, or 3.4 percent, are policy-related. The Big Four sectors hired an average of roughly 290 revolvers out of a total of 515 lobbyists. According to the main coefficient estimate in Equation 2, a paragraph's worth of increase by 80 policy words on average corresponds to the hiring of 23 additional revolvers sector-wide. The data therefore yield strong evidence for Hypothesis **H1**.

I additionally examine whether policy uncertainty matters for the percentage of lobbyists who not only are revolvers but former members of Congress. Like Ban, Palmer and Schneer (2019), I find no evidence for the same positive relationship when singling out this most elite group of revolvers. I display this ancillary analysis in Appendix C. As shown earlier, overall lobbying activity - judging by either summing up expenditure or counting clients - does not exhibit a consistently positive relationship with policy uncertainty. I include

regression analysis corroborating this null finding as Appendix D, with the two measures of total lobbying activity as the dependent variable but otherwise paralleling the two-way fixed effects model (Equation 2). That the overall amount of lobbying is unresponsive to policy uncertainty underscores the systematic switch of demand from conventional lobbyists to revolvers.

I seek corroborating evidence for the strong relationship between perceived policy uncertainty and companies' preference for revolving-door lobbyists by testing the same theory from the perspective of lobbyists rather than that of clients, in the form of Hypothesis **H2**. Lobbyists are seekers of clients, and as such individual lobbyists' portfolios should reflect interest groups' demand for their service; individual careers are microcosms of the overall marketplace. Thus, I expect the positive relationship between companies' preference for revolvers to conventional lobbyists to manifest itself in a comparison between revolvers' and conventional lobbyists' clienteles. Specifically, revolvers' clienteles should grow disproportionately in response to rising policy uncertainty in the economic sectors in which they practiced.

In statistical terms, this expectation translates into a positive interaction effect between policy uncertainty and lobbyists' revolver status as explanatory variables for lobbyists' number of clients in a given sector in a given year. This requires panel data containing unique combinations of lobbyist, sector, and year that describe individual lobbyists' career trajectories in every sector of relevance to them. Starting with a balanced panel data set containing every possible combination of the three dimensions, I remove two types of observations based on plausible assumptions. First to be removed are lobbyist-sector pairs without factual basis. If throughout the whole period a lobbyist had no client in a sector, I assume that she never practiced in this sector and therefore was never seeking clients in it. Also removed are observations that chronologically precede her first lobbying contract, reflecting an underlying assumption that she only became client seekers after her initial appearance in the data. The other side of this assumption is that she never stopped seeking clients in her relevant sectors,

thereby ignoring her possible retirement, death, or cessation of work for any reason. Such an assumption is certainly incorrect to some extent, but I do not expect it to cause any major inaccuracy in hypothesis testing, if only due to the relative brevity of the eleven-year period.

With these two types of observations dropped, the resulting data set contains 4,805 unique lobbyists as well as the usual 4 sectors and 11 years, making up 15,144 unique combinations. In Table 3, I display regression equations that somewhat parallel the earlier analysis (Table 2) in functional form. The dependent variable is a lobbyists' number of clients in a given sector in a given year. The main independent variables are policy uncertainty, whether lobbyists were revolvers, and their interaction. The last one is key. As before, all equations control for lagged dependent variables and sector fixed effects. Equation 2 contains year fixed effects, and equation 3 replaces them with a linear trend. Equations 2 and 3 also control for the usual set of time-variant sector characteristics - total assets, concentration, and the number of companies. Standard errors are clustered by lobbyist.

Table 3: Linear Regression - Policy Uncertainty and Lobbyists' Number of Clients Across Economic Sectors

	<i>Dependent variable:</i>		
	Number of Clients		
	(1)	(2)	(3)
Uncertainty	5.835** (2.903)	3.880 (2.901)	5.548* (2.938)
Revolver	-0.087* (0.049)	-0.070 (0.050)	-0.064 (0.050)
Uncertainty \times Revolver	4.041** (1.587)	3.567** (1.600)	3.383** (1.607)
Total Assets		0.0000*** (0.000)	0.0000*** (0.000)
Concentration		-0.016*** (0.004)	-0.008** (0.004)

Number of Companies		0.0001*	0.0002*
		(0.0001)	(0.0001)
Constant	0.312***	1.327***	0.865***
	(0.104)	(0.301)	(0.276)
Lagged DV	1	1	1
Sector Fixed Effects	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	No
Linear Trend	No	No	Yes
Observations	15,144	15,144	15,144
R ²	0.584	0.584	0.582
Adjusted R ²	0.583	0.584	0.582
χ^2	13,268.500***	13,296.390***	13,203.000***

Note: Standard errors are clustered by lobbyist.

*p<0.1; **p<0.05; ***p<0.01

This regression analysis provides strong support for Hypothesis **H2**. On its own, policy uncertainty is positive and statistically significant in equations 1 and 3 but not in Equation 2. Due to the presence of the interaction term, these estimates suggest that policy uncertainty positively relates to conventional lobbyists' clienteles but this relationship does not survive year fixed effects. The interaction term involving policy uncertainty and lobbyists' revolver status measures how much more the a unit increase in policy uncertainty mattered for revolvers' clienteles than for conventional lobbyists' clienteles. Across the three equations, it holds strong statistical significance, a positive sign, and a stable size. According to Equation 2, a two-way fixed effects model with time-variant control variables, policy uncertainty bears no significant relationship with conventional lobbyists' number of clients, but does relate to that of revolvers. To make sense of its size, a percentage-point increase in a sector's median share of policy words in risk factor discussions on average brought an additional 3.6 percent of a client to a revolver. This effect is admittedly small, but should be considered in light of the baseline size of lobbyist clienteles. On average from 2006 to 2016, the average lobbyist served between a quarter to half of a client within a given sector, making the coefficient estimate fairly sizable in context.

Finally, data on individual companies' yearly perceptions of policy uncertainty permit panel analysis at the company-year level of the relationship between policy uncertainty and lobbying activity. I show this analysis in Appendix E, divided into two regression tables. In the first, I model companies' yearly lobbying expenditure and percentage of revolvers, respectively, as a function of their own perceptions of policy uncertainty, controlling for their time-variant market share along with company fixed effects, year fixed effects, and a lagged term for the dependent variable. In neither equation does policy uncertainty obtain a significant coefficient though it has the expected sign in relation to the percentage of revolvers. As explained earlier, company-level policy risk perceptions estimated by counting policy words likely contain an excessive amount of measurement error. Due to the boiler plate approach that many companies follow when drafting 10-K filings (Kravet and Muslu 2013), temporal variations of the same companies' risk perceptions likely contain an inordinate amount of random noise that has nothing to do with the construct being measured but is strong enough to mask it.

Shown in the second table within Appendix E, I conduct another set of company-year level analysis but go back to using sector medians to measure policy uncertainty instead of individual companies' perceptions. This time, uncertainty moves toward significance as a explanatory variable for the percentage of revolvers but still falls short of obtaining it (p-value: 0.15).

5 Conclusion

The theory that interest groups spend money lobbying in order to insure against risks of adverse policy change has been well-received but seldom tested. In this paper, I test this theory using an empirical strategy with two pillars. The first is realizing the variability of how much risk exists in the policy relevant to interest groups and then measuring it. I do so by measuring how much for-profit companies doing business in utilities, chemical manufacturing,

electronic manufacturing, and insurance emphasize policy risks in their annual 10-K filings submitted to the Securities and Exchange Commission from 2006 to 2016. Counting the percentage of policy-related key words in these filings, I estimate a time-variant measure of policy uncertainty that is also specific to economic sectors. That perceived policy uncertainty governing the Big Four sectors hardly runs parallel with each other over the eleven-year period supports the sector specificity of policy uncertainty. This measure is a key independent variable in two complementary sets of panel analysis, both showing that companies' demand for revolvers relative to conventional lobbyists increased with policy uncertainty governing their sectors.

The second pillar of my empirical strategy concerns lobbyists' skill sets. Previous work experience in government gives lobbyists knowledge of the policymaking process, a professional asset valued by interest groups seeking insurance against risks of adverse policy change (LaPira and Thomas 2017). Combining the two pillars, a hypothesis that readily follows is that times of more severe policy risks should see revolving-door lobbyists generating particularly large amounts of lobbying business compared with conventional lobbyists. Panel data linking companies' perceptions of policy uncertainty and their demand for revolvers yield strong evidence for the hypothesis.

I first show that the percentage of revolvers among all revenue-generating lobbyists is positively associated with policy uncertainty across the Big Four sectors. Consistent with this result, I then show that in each sector revolvers' clienteles expand considerably when policy became more uncertain. These findings point to a robust relationship between what is thought to be companies' primary political problem and their reliance on lobbyists credited with being particularly good at countering it. This conclusion builds in important ways on an existing finding that revolvers generate more revenue when policy uncertainty - as a system-wide property irrespective of policy area - is high (Ban, Palmer and Schneer 2019). Furthermore, I find that high policy uncertainty profits revolvers' careers quite exclusively by elevating companies' demand for them. The analysis does not show that the lobbying activity

of conventional lobbyists reliably increases with policy uncertainty in a similar fashion.

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Supplemental Information for “Policy Uncertainty and
Demand for Revolving-Door Lobbyists”

Appendix

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A Procedure for Calculating Policy Uncertainty

I measure sector-wide levels of policy uncertainty based on companies' emphasis of policy risks in their annual 10-K filings submitted to the U.S. Securities and Exchange Commission. This process consists of the following steps.

Step 1: Downloading 10-K Filings

Two undergraduate research assistants helped me obtain 10-K filings submitted by companies in the four economic sectors, randomly sampled in advance, from 2006 to 2016. They downloaded the full texts of the reports from the SEC's "Edgar" search portal (<https://www.sec.gov/edgar.shtml>) in TXT or HTML format depending which one was available. The starting year is 2006 because risk factor discussions were not previously required as an explicit item to be contained in 10-K filings. For filings downloaded as HTML files, I remove HTML tags using R code so that only actual textual information remains.

Step 2: Extracting Risk Factor Discussions

I write R code to extract the excerpts of 10-K filings devoted to discussing risk factors perceived by companies' management. These excerpts are usually "Item 1A" of the filings, and are thus identified as texts between the headers "Item 1A" and "Item 1B" (or, in rare cases where "Item 1B" is absent, between the headers "Item 1A" and "Item 2"). Manual checking of excerpts obtained this way confirms the reliability of the method. After obtaining risk factor excerpts of 10-K filings, I perform a number of standard steps to process them: removing "stop words" without substantive meaning (e.g., "this" and "have"), transforming all words into word stems (e.g., from "regulation" and "regulatory" to "regulat"), and removing sparse words which appear in 10% or less of the excerpts.

Step 3: Measuring Emphasis on Policy Risks

I count the following words and word stems related to policy risks as a percentage of the length of each excerpt, as processed according to the steps above: “govern”, “feder”, “congress”, “agenc”, “court”, “administr”, “commiss”, “legisl”, “legislatur”, “polici”, “penalti”, “fine”, “law”, “regul”, “regulatori”, “zone”, “licen”, “licens”, “licensor”, “oversight”, “compliand”, “compliant”, “noncompli”, “enforc”, “unenforc”, “requir”, “pursuant”, and “protect”. This percentage measures the degree to which a company emphasizes policy risks in a year among all risk factors it perceives.

Step 4: Calculating Sector Median Policy Risk Perceptions

I obtain the median percentage of policy-related words and word stems for each of the four sectors in each year from 2006 to 2016. The sector median values constitute a major independent variable in the two sets of panel analysis in this study.

B Summary Statistics of Sector-Year Level Panel Data

This table contains summary statistics of panel data at the sector-year level. This data set is the basis of testing Hypothesis **H1** - the share of revolving-door lobbyists among all lobbyists should increase in an economic sector when its policy environment becomes more uncertain. The table displays the groups that constitute the cross-sectional (sector) and longitudinal (year) dimensions of the data, and lists the variables, their numbers of observations, means, and minimum and maximum values.

Summary Statistics of Sector-Year Level Panel Data				
Statistic	N	Mean	Min	Max
Groups				
Sector	4			
Year	11		2006	2016
Variables				
Number of Clients	44	80.205	44	143
Total Lobbying Expenditure	44	93,818.630	39,935.770	163,793.200
Number of Lobbyists	44	559.432	357	1,052
Percentage of Revolvers	44	0.650	0.508	0.774
Percentage of Former Members of Congress	44	0.028	0.016	0.043
Policy Uncertainty	44	0.035	0.020	0.042
Total Assets	44	6,470,930.000	1,436,284.000	21,095,289.000

Concentration	44	80.385	63.848	90.861
Number of Companies	44	533.545	177	992

C Linear Regression - Policy Uncertainty and Lobbying Activity of Former Members of Congress Across Economic Sectors

This table displays sector-year level regression analysis that estimates how policy uncertainty relates to the percentage of former members of Congress among active lobbyists in economic sectors. Former members of Congress are particularly high-profile revolving-door lobbyists. The coefficient estimates for the policy uncertainty variable show that this relationship is on average negative but does not reach statistical significance. This is in contrast with the main finding of this paper - policy uncertainty is positively associated with the percentage of revolvers in general among active lobbyists.

Linear Regression - Policy Uncertainty and Lobbying Activity of Former Members of Congress Across Economic Sectors

	<i>Dependent variable:</i>	
	% Former Members of Congress	
	(1)	(2)
Uncertainty	-0.366 (0.442)	-0.220 (0.504)
Total Assets	-0.000 (0.000)	0.000 (0.000)
Concentration	0.001 (0.0005)	-0.00002 (0.001)
Number of Companies	0.00000 (0.00001)	0.00001 (0.00001)
Constant	-0.001 (0.056)	0.017 (0.060)
Lagged DV	2	2
Sector Fixed Effects	Yes	Yes

Year Fixed Effects	Yes	No
Linear Trend	No	Yes
Observations	44	44
R ²	0.569	0.484
Adjusted R ²	0.228	0.328
χ^2	37.061*** (df = 19)	29.149*** (df = 10)

Note: Standard errors are clustered by sector.

*p<0.1; **p<0.05; ***p<0.01

D Regression Analysis - Policy Uncertainty and Total Lobbying Activity Across Economic Sectors

Regression Analysis - Policy Uncertainty and Total Lobbying Activity Across Economic Sectors

	<i>Dependent variable:</i>	
	Number of Clients	Lobbying Expenditure
	(1)	(2)
Uncertainty	-65.161 (197.879)	1,149,971.000 (1,124,572.000)
Total Assets	0.00000*** (0.00000)	0.003*** (0.001)
Concentration	0.532* (0.292)	-948.627 (768.021)
Number of Companies	0.009 (0.006)	-36.710*** (10.541)
Constant	-7.201 (19.813)	67,758.220 (83,612.780)
Lagged DV	2	2
Sector Fixed Effects	Yes	Yes
Year Fixed Effects	Yes	Yes
Observations	44	44
R ²	0.994	0.947
Adjusted R ²	0.990	0.905
χ^2 (df = 19)	227.780***	129.351***

Note: Standard errors are clustered by sector.

*p<0.1; **p<0.05; ***p<0.01

E Regression Analysis - Policy Uncertainty and Lobbying Activity Across Companies

The following two tables display regression analysis at the company-year level instead of the usual sector-year level. In the first table, I model companies' yearly lobbying expenditure and percentage of revolving-door lobbyists, respectively, as a function of their own perceptions of policy uncertainty. In the second table, I conduct parallel analysis but go back to using sector medians to measure policy uncertainty instead of individual companies' perceptions. The association between sector-wide policy uncertainty and percentage of revolvers is not consistently borne out in the lobbying activity of individual companies, at least partially due to greater noise in measuring individual companies' perceptions of policy uncertainty from year to year.

Using Company-Specific Policy Uncertainty		
	<i>Dependent variable:</i>	
	Lobbying Expenditure	% Revolvers
	(1)	(2)
Uncertainty (Company)	-38,754.930 (34,858.360)	0.691 (0.780)
Total Assets	0.013*** (0.005)	0.00000*** (0.00000)
Market Share	-18,572.980 (28,516.420)	-1.519 (2.153)
Constant	1,300.218** (646.703)	0.319*** (0.029)
Lagged DV	1	1
Company Fixed Effects	Yes	Yes
Year Fixed Effects	Yes	Yes
Observations	669	1,306
R ²	0.625	0.725

Adjusted R ²	0.546	0.690
χ^2	656.780*** (df = 117)	1,686.235*** (df = 149)

Note: Standard errors are clustered by company.

*p<0.1; **p<0.05; ***p<0.01

Using Sector Median Policy Uncertainty

	<i>Dependent variable:</i>	
	Lobbying Expenditure	% Revolvers
	(1)	(2)
Uncertainty (Sector)	28,594.570 (35,368.310)	3.974 (2.784)
Total Assets	0.010** (0.004)	0.00000*** (0.00000)
Market Share	14,168.620 (13,079.460)	-1.030 (1.044)
Constant	2,885.759*** (880.170)	0.179* (0.100)
Lagged DV	1	1
Company Fixed Effects	Yes	Yes
Year Fixed Effects	Yes	Yes
Observations	1,746	3,652
R ²	0.836	0.704
Adjusted R ²	0.802	0.670
χ^2	3,155.843*** (df = 297)	4,449.704*** (df = 378)

Note: Standard errors are clustered by company.

*p<0.1; **p<0.05; ***p<0.01