

Patent ownership, trade and lobbying

Nihan N. Akhan*

European University Institute

February 2023

Abstract

This paper argues that patent ownership is an important determinant of trade related lobbying and it examines the engagement of firms in lobbying on intellectual property rights when they are exposed to trade shocks. By using the data of publicly listed firms and firm level federal lobbying reports in the US, I first show that patent-owner firms dominate trade lobbying. In addition, by investigating the impact of the China shock on lobbying related to intellectual property rights, I demonstrate that firms are more engaged in lobbying on intellectual property rights (IPR) when they are exposed to trade shocks. Using the identification strategy of Autor et al. (2013), I establish a causal link between import penetration from China and IPR lobbying. Findings suggest that firms increase their lobbying on intellectual property rights as a response to the import penetration from China. Results also highlight the heterogeneous impact on lobbying. Finally, at the industry level, this paper links trade lobbying to trade-related regulations.

JEL classifications: D72, O30, L60.

*I would like to thank David K. Levine and Giacomo Calzolari for their time and valuable comments. All errors are mine.

1 Introduction

Lobbying activities lie at the intersection of political and economic spheres. Indeed, special interest groups and their representatives play a significant role in the writing process of the bills. Recently, the influence of interest groups draw particular attention due to an observed rise in regulatory complexity and lobbying expenditures (e.g., Gutiérrez, 2019). Some studies argue that the firms affect regulations and change them to their advantage (e.g., Kim and Milner, 2018 and Rodrik, 2018). The rising concentration and existence of superstar firms adds another layer to these discussions (e.g., Autor et al., 2020). Recent studies also discuss the depth of trade policies and the importance of non-trade policies.¹ Indeed, it is crucial to understand the drivers of the lobbying and investigate the lobbying responses of the firms to the international trade shocks.

This paper mainly investigates the impact of import penetration from China on lobbying related to IPR.² Using firm level federal lobbying reports from Kim (2018), first, I argue that trade lobbying is dominated by the patent-owner firms. Then, I examine the lobbying reaction of firms to increased competition from China for the years between 1999-2007. I establish a causal link between import penetration from China and lobbying on IPR by using the identification strategy of Autor et al. (2013). I also provide results showing the heterogeneous impact on lobbying by separating firms according to their productivity and trade intensity. Finally, at the industry level, this paper links trade lobbying to trade-related regulations.

My empirical strategy depends on the substantial competition shock created by China due to its emergence as a major player in the world. The simple OLS estimates would suffer from endogeneity since it is hard to separate demand and supply shocks. In order to overcome this endogeneity concern, I followed the identification strategy of Autor et al. (2013). I simply instrument U.S. imports from China by the imports of eight different countries during the

¹ See e.g., Mattoo et al. (2020); Blanga-Gubbay et al. (2023).

² There are different types of intellectual property. In this paper IPR refers to the patents, copyrights and trademarks. This limitation is due to the nature of the lobbying reports. The lobbying issue codes for IPR related topics covers Copyright, Patent, and Trademark. The code for this issue is CPT. For simplicity, I refer lobbying on this issue as IPR. For more information about the issue codes please refer to <https://lda.congress.gov/ld/help/default.htm?turl=Documents%2FAppCodes.htm>.

same period.³

This study uses multiple data sources. First, I utilize the US Federal lobbying data at the firm level. This data is compiled and provided by Kim (2018). It offers detailed information about the lobbying reports. I merge this data with the publicly listed firms in the US from Compustat using firm identifier. I also utilize patent data at the firm level by Arora et al. (2021). Finally, I gather trade data from UN Comtrade via the World Integrated Trade Solution (WITS) platform.

I provide three main results. First, merging firm level patent data and lobbying data, I show that trade lobbying is dominated by patent-owner firms. I use this results to motivate the next analysis which is based on the impact of the China shock on IPR lobbying. I argue that the firms in the US respond to import penetration from China by increasing their lobbying activities in IPR both at the intensive and at the extensive margin. To eliminate endogeneity concerns, I instrument import penetration from China with the imports of other countries. I observe that 10 percentage points increase in the import share from China increases the probability of lobbying on IPR by 0.6 percentage points and amount of lobbying by %7. Finally, I show that there is a positive link between trade lobbying and trade related regulations at the industry level.

To strengthen the credibility of the results, I perform robustness checks. First, I consider placebo timing. I use the sample covering the years after 2007 until 2015 as placebo sample.⁴ I do not observe any statistically or economically meaningful impact of import penetration from China. In addition, I use lobbying on other issues as a placebo group. For this analysis, I exclude the lobbying on trade and IPR. Results suggest that there is no positive impact of import penetration from China on other issues.

This paper contributes to the many strands of the literature. First, this paper contributes to the empirical lobbying literature. Bombardini and Trebbi (2012) is one of the first studies investigating the relationship between industry characteristics and the mode of lobbying by using federal lobbying expenditures in the US. Their results suggest that sectors with higher

³ As in the Autor et al. (2013), I use Australia, Denmark, Finland, Germany, Japan, New Zealand, Spain and Switzerland.

⁴ For the baseline analysis, the last year in my sample is 2007 as in Caselli et al., 2021; Autor et al., 2013; Aghion et al., 2021.

level of competition and less concentration are more likely to organize politically and lobby together as a trade association. Bertrand et al. (2004) present evidence to discuss the relative importance of connections versus issue expertise in the US Federal lobbying process. Blanes i Vidal et al. (2012) examines personal connections of ex-government employees and the benefits from this channel. Ludema et al. (2018) also investigates political influence of individual firms on congressional decisions by focusing on tariff suspensions on US imports of intermediate goods. Kang (2016) quantifies the impact lobbying expenditures on policy enactment by focusing on all federal energy legislation. Kim (2008) links product differentiation in economic markets to firm-level lobbying in political markets. There are recent studies linking multi-nationality and lobbying. Indeed, Kim and Milner (2018) claims an increase in lobbying expenditures when firms become multinational. A recent study by Blanga-Gubbay et al. (2023) shows that large firms in international trade dominate the political economy of free trade agreements and supports the ratification of the free trade agreements. They find out that individual firms spend more to support FTAs that produce larger gains and larger firms spend more to support FTAs. Finally, a recent paper by Bombardini et al. (2021) investigates lobbying responses of firms to increasing competition in US industries.⁵ I differentiate my paper from this strand of literature by first linking firms' patent ownership to trade lobbying. In addition, I establish a causal link between import penetration from China and IPR lobbying.

This paper also contributes to the papers investigating the relationship between trade liberalization and firms' outcomes. While many papers examine the impact of trade liberalization on firms' productivity (e.g., Amiti and Konings, 2007; Pavcnik, 2002.), other papers investigate the impact on innovation.⁶ Significant share of the papers mainly focus on competition from China. The influential paper by Autor et al. (2013) links Chinese import competition to labor markets. Autor et al. (2020) show that rising import exposure is linked to an increase in competition, decrease in sales, profitability, and R&D expenditure. Bloom et al. (2016) show that the absolute volume of innovation increases with the import penetration from China. Recent papers investigate the impact of penetration of China into

⁵ See Bombardini and Trebbi (2020) and de Figueiredo and Richter (2014) for excellent reviews of empirical research on lobbying literature.

⁶ See the excellent review by Shu and Steinwender (2019) on this topic.

the world market using firm level data. For example, Caselli et al. (2021) links labour market imperfections to competition from China using firm level data from France. In addition, Aghion et al. (2021) decompose the China shock into an output and input supply shock. Using firm level data from France, they argue that the output shock negatively affects firms' employment and sales. My paper differentiates from these papers since I focus on the lobbying responses of the firms.

The remainder of the paper is organized as follows. Section 2 provides information on the data. Section 3 presents empirical strategy. Section 4 discusses link between patent ownership and trade lobbying. Section 5 presents baseline results. Section 6 briefly discusses the impact of trade lobbying on federal regulation restrictions. Section 7 concludes.

2 Data

This section explains the dataset that is used in this paper. It also provides information on the construction of main variables.

2.1 Data Sources

Firm level lobbying data I measure political activity and lobbying by utilizing firm level federal lobbying reports. Due to US Lobbying Disclosure Act (LDA) in 1995, all the reports of federal lobbyists are publicly available and I utilize LobbyView database provided by Kim (2018) to gather organized representation of these lobbying reports. These reports includes detailed information on client firms, lobbyists, summary of the lobbying activity, list of the issues lobbied, report level amount of lobbying and year-quarter of the lobbying activity. LobbyView database also provides firm identifier (gvkey) to merge these lobbying activities to Compustat. One example of the lobbying reports can be found in Figure 8 the Appendix.

Firm level federal lobbying dataset offers one important advantage compared to the campaign contributions data used by early papers related to protection for sale model (e.g., Grossman and Helpman, 1994) such as Gawande and Bandyopadhyay (2000) and Goldberg and Maggi (1999). In contrast to Political Action Committees (PACs) monetary contributions, context of the lobbying reports allows us to detect specific issues that lobbying parties

are interested in. In below, Figure 1 shows the evolution of the number of trade and IPR related reports over time. We observe an increase in the number of lobbying reports related to trade and IPR.

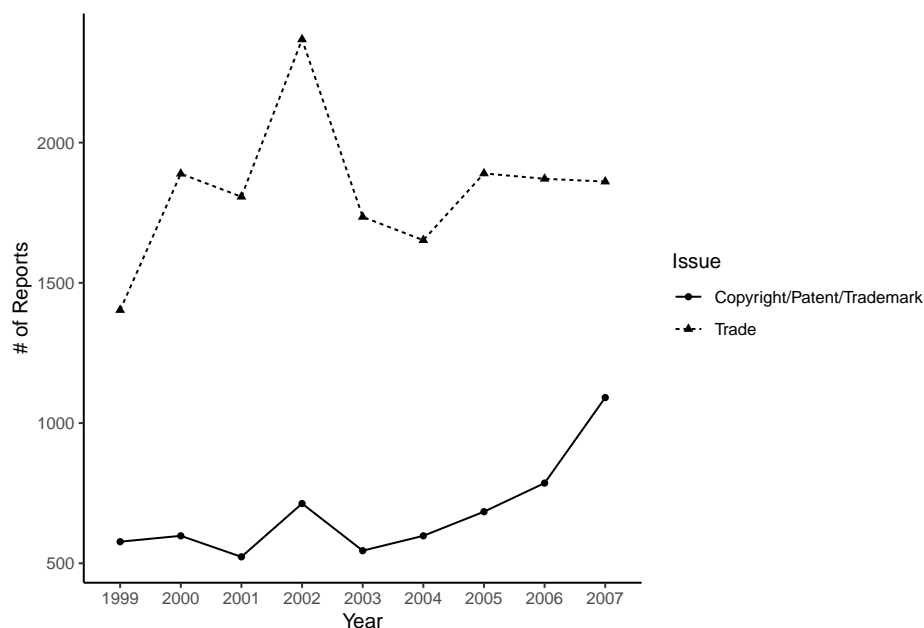


Figure 1: Evolution of # of lobbying reports

To be able to understand the content of the lobbying activities, I perform text mining techniques on the reports. In particular, I used Latent Dirichlet Allocation to perform topic modelling. For this analysis, I limit the sample to the reports related to trade and IPR. I also limit the sample to the manufacturing firms. I applied topic modelling technique to every year separately. Figure 2 shows the proportion of the topics that is defined by the five top frequent words for each subject of lobbying. This figure reports only the results for the year 2001.

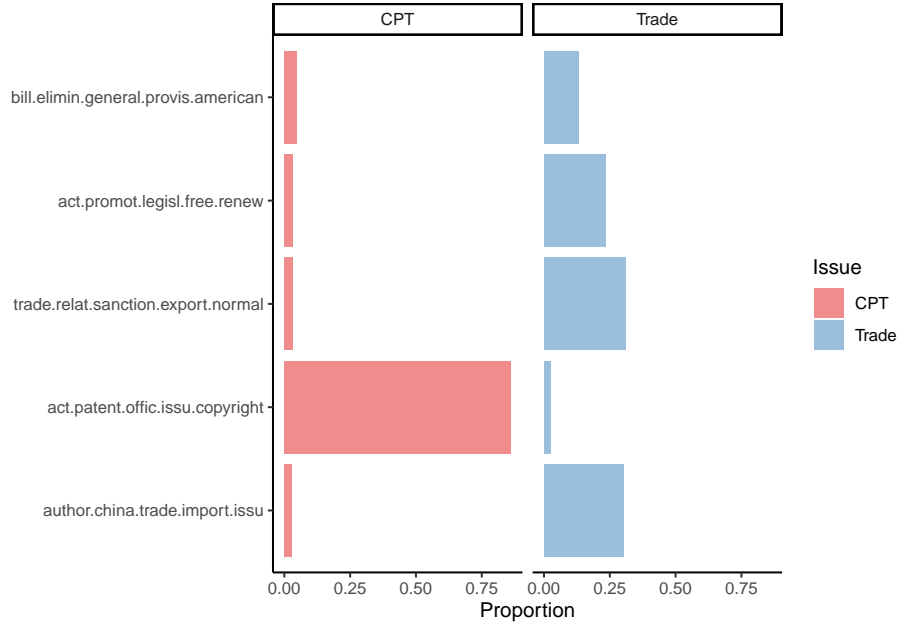


Figure 2: Topic modelling for trade and IPR related reports for 2001

As expected, China's penetration in world markets appears to be an important subject in the reports.

Compustat I complement lobbying data with the publicly listed firm level data from Compustat. I merge these two dataset by using firm level identifier (gvkey). The standard firm level controls such as employment, sales, fixed assets, R&D expenditures and industry information (SIC) are observed in Compustat. In the baseline estimations, I control variables that might affect the lobbying activities such as firm size and labor productivity (sales per worker). I also constructed the HHI using the sales of the firms for each industry(SIC)-year group. Finally, I created a variable in line with the Kim and Milner (2018) to measure whether firm is multinational or not. Using firm's pretax foreign income (pifo), I created binary variable that takes value of 1 if pretax foreign income is reported. I limit my sample to the manufacturing firms and years between 1999-2007 inline with the papers investigating the impact of import penetration from China.⁷ I perform standard cleaning procedures. I keep the firms reporting positive levels of employment,sales and total assets. I drop top and bottom one percent of the employment, sales and total assets distribution to exclude

⁷ See e.g., Autor et al., 2013; Caselli et al., 2021; Aghion et al., 2021.

abnormalities. All monetary values are deflated and stated in 2015 dollars.

Patent Data To be able to observe patent data at the firm level, I utilize the dataset provided by Arora et al. (2021). This dataset provides an patent stocks and yearly patent numbers of the firms by considering dynamic reassignment, name and ownership changes. I merge Compustat and the firm level patent with the unique firm level identifier (gvkey).

Trade data Finally, I obtain the trade data between China and the US from UN Comtrade Database via WITS platform. I also gather trade data for the countries used as instruments. This data gives the value of the bilateral trade at the six-digit HS level. I map these HS level codes to 4 digit-SIC codes using concordance tables from Schott (2008).

Regulation Database In Section 5, I link industry level lobbying to the industry specific regulation restriction indexes. For this section, I utilize RegData provided by Al-Ubaydli and McLaughlin (2017). This data quantifies federal regulations by industry and regulatory agency for all federal regulations from 1997-2020. RegData analyzes the text of federal regulations to count binding constraints in the wording of regulations and links these regulatory text to different industries at different levels from two digit to six digit. They provide two different regulatory indexes. Both of the indexes are close to each other, while one of them uses a method that captures restrictions hidden in lists or bullet points.⁸ The data uses North American Industry Classification System. I use this data to construct industry-year level index. To create this index, I first multiply the document level regulation indexes with the document-industry (NAICS4) probabilities.⁹ Then, I aggregate these regulation indexes to industry (NAICS4)-year level.¹⁰ I limit my sample to the manufacturing firms and the years between 1999-2020. I also limit my sample to the 1999-2007 as robustness check this results can be found in the Table 11. I merge regulation data with the industry specific lobbying data from Kim (2018) to quantify the impact of lobbying on regulation indexes. To be able to avoid aggregation of the lobbying activities and focus more on specific issue, I limit my sample to regulatory texts from trade related agencies such as Federal Trade Commission (FTC) and International Trade Administration (ITA). Unfortunately, RegData does not provide any regulation indexes from the regulatory agencies related to patents.

⁸ See Al-Ubaydli and McLaughlin (2017) for more details.

⁹ Note that each document (regulatory text) has a year of introduction.

¹⁰ This method is carefully explained in Al-Ubaydli and McLaughlin (2017).

Before turning to the analysing, I provide graphical evidence on the relationship between firm productivity and Trade-IPR lobbying. Panel (a) of Figure 3 plots the distribution of deflated and standardized labor productivity for firms lobby IPR vs firms do not lobby IPR. The figure reveals that the distribution of firms lobbying IPR is shifted to the right compared to the distribution of firms that do not lobby IPR. Since I compute the measure of labor productivity relative to the year mean, differences in firm labor productivity across years are not driving this observation. Panel (b) of Figure 3 plots the distribution of labor productivity with respect to trade lobbying. Similar pattern is observed in the distribution of labor productivity with respect to trade lobbying.

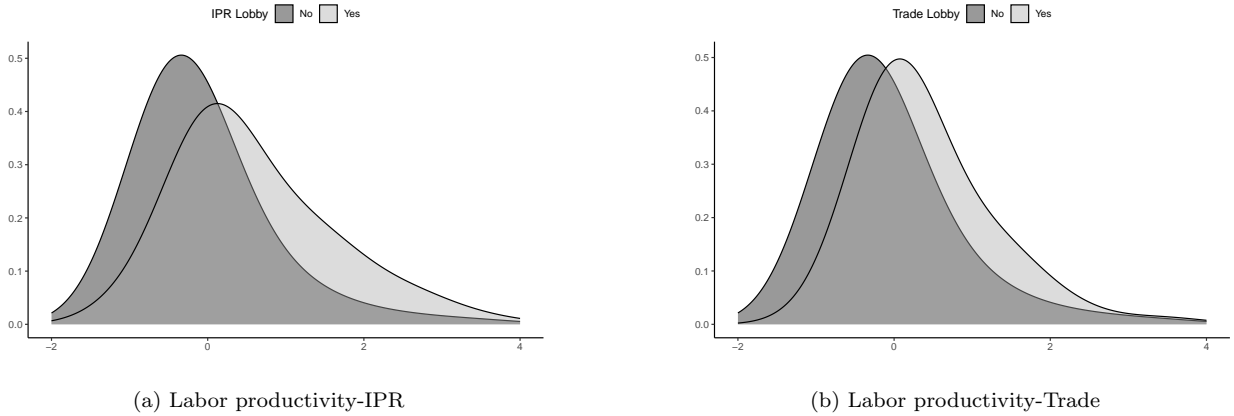


Figure 3: Panel (a) depicts the distribution of standardized labor per worker with IPR lobbying separation. Panel (b) shows the same as panel (a) using standardized labor per worker with respect to trade lobbying.

The Table 1 presents the summary statistics from the sample. The sample period covers the years between 1999–2007. The lobbying variables refers to the IPR related lobbying under the issue code covering Copyright, Patents and Trademark (CPT). The amount of lobbying is in thousands of 2015 dollars.

Table 1: Summary Statistics

Statistic	N	Mean	St. Dev.	Median	P25	P75
Log(Emp)	14,674	6.042	1.957	5.861	4.585	7.500
Log(Sale)	14,674	18.307	2.322	18.364	16.724	19.988
Log(Assets)	14,674	18.678	2.049	18.658	17.238	20.157
Log(Sale/Emp)	14,674	12.265	0.833	12.360	11.933	12.754
Foreign-Income(Binary)	14,674	0.261	0.439	0	0	1
HHI	14,674	0.224	0.175	0.173	0.111	0.259
Patent Stock	14,674	40.082	236.903	2.800	0.000	15.541
Patent (Yearly)	14,674	9.339	55.532	0.000	0.000	4.000
Lobby Amount	14,674	3.408	63.398	0.000	0.000	0.000
Lobby(Binary)	14,674	0.013	0.111	0	0	0
of Reports	14,674	0.032	0.377	0	0	0
China Import Share	14,674	0.095	0.133	0.045	0.008	0.125
Import Share (Instrument)	14,674	0.070	0.099	0.033	0.005	0.096

Summary statistics. This table reports the summary statistics of the main variables. The sample period covers the years between 1999–2007. The lobbying variables refers to the IPR related lobbying under the issue code covering Copyright, Patents and Trademark (CPT). The amount of lobbying is in thousands of 2015 dollars.

3 Empirical Strategy

In this section, I discuss the empirical strategy. Using instrumental variable strategy, I estimate the impact of import penetration from China on firms' lobbying related to IPR(CPT). In all of these specifications, I consider the the binary lobbying variable which takes value of 1 if firm lobby on the particular subject at time t, zero otherwise. I also consider the number of reports for a particular subject at time t and the amount of lobbying. The amount of lobbying refers to the firms' total amount of lobbying in particular subject at time t. To include firms with zero lobbying amount, I add one and use log of the lobbying amount. Formally, I consider the following equation.

$$Y_{i,j,t} = \mu_j + \gamma_t + \beta ImportShare_{j,t} + \delta \mathbf{X}_{i,t} + \epsilon_{i,j,t} \quad (1)$$

where $Y_{i,j,t}$ is one of the following variables: lobbying (binary), number of reports, and amount of lobbying for firm i in industry j time t . μ_j and γ_t are the sector (SIC) and year fixed effects. $ImportShare_{j,t}$ is the share of imports from China in total import of USA for sector j time t . Finally, $\mathbf{X}_{i,t}$ denotes for the firm controls such as firms' log employment, log sales per worker, HHI, log patent stock¹¹, binary indicator takes value of 1 if firm lobbies on other issues at time t , binary variable for foreign income and the log of the rest of the employment in the industry. In addition, at the industry-year level.¹² β main variable of interest and it is expected to have positive sign.

The baseline estimation suffers from endogeneity since β also might reflect the increase in the U.S. demand. To focus on the supply-shock from China, following Autor et al. (2013), I instrument U.S. import share from China with imports share of eight different countries, during the same period. As in Autor et al. (2013), these countries are Australia, Denmark, Finland, Germany, Japan, New Zealand, Spain and Switzerland.¹³

4 Patent ownership and trade lobbying

In this section, I briefly investigate the relationship between trade lobbying and patent-ownership. I show that the patent-owner firms dominate the trade lobbying. I consider this section to motivate my results for the baseline analysis. Since patent-owner firms dominate trade lobbying, under a competition shock it is expected to observe increase in the lobbying related to IPR.

In this section, I use a similar model that is presented in the empirical strategy section. Instead of considering IPR lobbying on the right hand side, I collapse the trade and tariff related lobbying reports to the firm and year level. I add all the control variables to the estimation that is explained in Section 4. For each firm, I observe the lobbying (binary), number of reports and log amount of lobbying each year. To include firms with zero lobbying amount, I add one and use log of the lobbying amount. The key variable of interest in this

¹¹ To include non-patent owner firms to the sample, I add one to the patent levels and take logs.

¹² Although, the rest of employment, and HHI is at the industry level (SIC), for the brevity of the notation I include them in the firm controls.

¹³ The discussion of the validity of the instrument is discussed in Autor et al. (2013) and Autor et al. (2016).

section is coefficient of the patent levels. I consider two different patent measures from Arora et al. (2021): yearly patent levels and patent stocks. To include non-patent owner firms in the sample, I add one to the patent measures and take logs. Figure 8 presents the results of these estimation. All of the controls explained in the Section 4 included in this estimations. Instead of import share from China, I control overall import and export shares in the total industry sales. The standard error are clustered at the 3-digit industry level (SIC3). The red line in Figure 4 depicts the estimates for yearly patent variable while the black line shows the estimates for yearly patent stock.

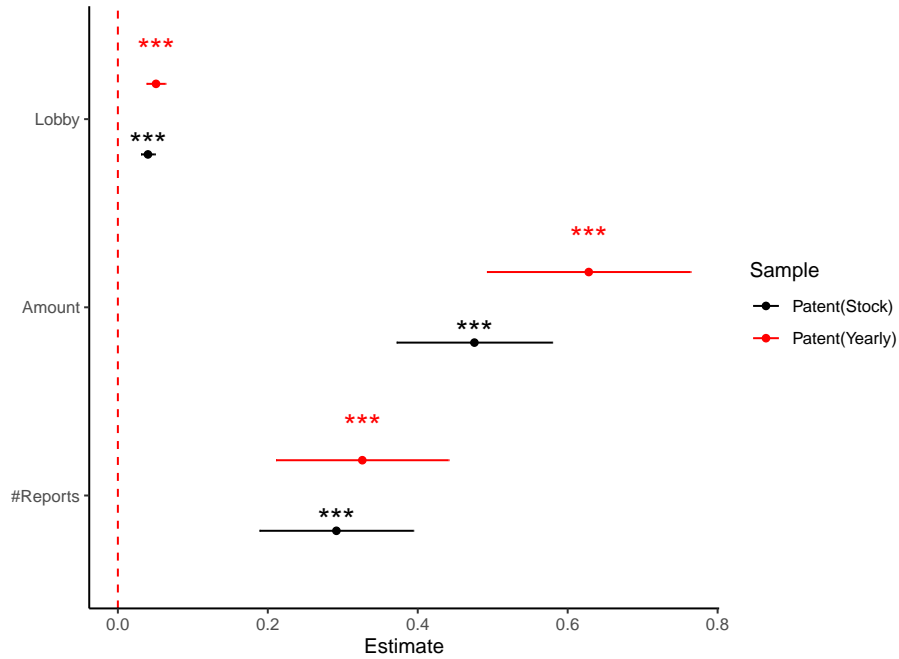


Figure 4: Patent-ownership and trade lobbying

Results suggest that the patent-owner firms dominate the trade lobbying. This results are also in line with recent discussions centered around the deep trade agreements (e.g., Mattoo et al., 2020; Rodrik, 2018; Blanga-Gubbay et al., 2023). In addition, results in this section might suggest that firms might have more incentives to lobby on IPR when they are exposed to a trade shock.

5 Import penetration from China and IPR lobbying

In this section, I, first, report the impact of import share from China on the IPR lobbying without using instrumental variable. Then, I present 2SLS estimation results with using eight different countries imports as an instrument.

Results of the baseline estimation is presented in the Table 2. First column of Table 2 presents results for the extensive margin. 10 percentage points increase in the import share from the China increases lobbying on IPR by 0.4 percentage points while it increases the amount of lobbying on IPR by %4. The results without the control variables can be found in Table 8 in the Appendix. I also consider probit estimation instead of OLS for binary lobbying. These results can be found in the first column of Table 9. First column of Table 9 shows the probit estimation without the instrument while the second column reports the estimates where import share is instrumented.

Table 2: Import penetration from China and IPR lobbying

	Lobby(Binary)	#Reports	Amount
Model:	(1)	(2)	(3)
	OLS	Poisson	OLS
<i>Variables</i>			
ImportShare	0.0425** (0.0164)	2.184*** (0.6837)	0.4344** (0.1975)
<i>Fixed-effects</i>			
SIC	Yes	Yes	Yes
Year	Yes	Yes	Yes
Controls	Yes	Yes	Yes
<i>Fit statistics</i>			
Observations	14,668	8,823	14,668
R ²	0.11948		0.11928
Pseudo R ²		0.58783	

Clustered (SIC3) standard-errors in parentheses. *Note:* *p<0.1; **p<0.05; ***p<0.01. Firm controls include log employment, log sales per worker, HHI, log patent stock, binary indicator takes value of 1 if firm lobbies on other issues at time t, binary variable for foreign income and the log of the rest of the employment.

2SLS estimation is given in Table 3. I observe that 10 percentage points increase in the import share from China increases the probability of lobbying on IPR by 0.6 percentage points and amount of lobbying by %7. As before first column reports the estimates for binary lobbying while the second and third columns reports results for the intensive margin measures. First stage coefficients also reported under the Table 3. These coefficients are statistically significant and economically meaningful. Kleibergen-Paap Wald F statistics which reported under the Table 3 which eliminates the weak instrument concerns.

Table 3: Import penetration from China and IPR lobbying

	Lobby(Binary)	#Reports	Amount
Model:	(1)	(2)	(3)
	OLS	Poisson	OLS
<i>Variables</i>			
ImportShare	0.0659*** (0.0213)	1.776* (0.9479)	0.7338*** (0.2562)
<i>Fixed-effects</i>			
SIC	Yes	Yes	Yes
Year	Yes	Yes	Yes
Controls	Yes	Yes	Yes
<i>Fit statistics</i>			
Observations	14,668	8,823	14,668
R ²	0.11965		0.11948
Pseudo R ²		0.58737	
Coef.-Instrument	1.0544*** (0.0338)	1.0636*** (0.0304)	1.0544*** (0.0338)
F-test (1st stage)	971.8	166.8	971.8

Clustered (SIC3) standard-errors in parentheses. *Note:* *p<0.1; **p<0.05; ***p<0.01. Firm controls include log employment, log sales per worker, HHI, log patent stock, binary indicator takes value of 1 if firm lobbies on other issues at time t, binary variable for foreign income and the log of the rest of the employment.

The coefficients with the 2SLS estimation is relatively higher compared to OLS coefficients.¹⁴ Downward bias observed in OLS estimates might suggest a possibility of reverse causality. In particular, this might suggest that the lobbying can have a negative effect on Chinese imports.

Heterogeneous Impact I also investigate heterogeneous impact on lobbying. Figure 5 reports the estimates from OLS with separating into sample into two groups for the extensive margin. Firms are labeled as productive if their sales per worker ratio is higher than the median productivity level of their sector j at time t.

¹⁴ Only the coefficient of number of reports is slightly higher in the OLS.

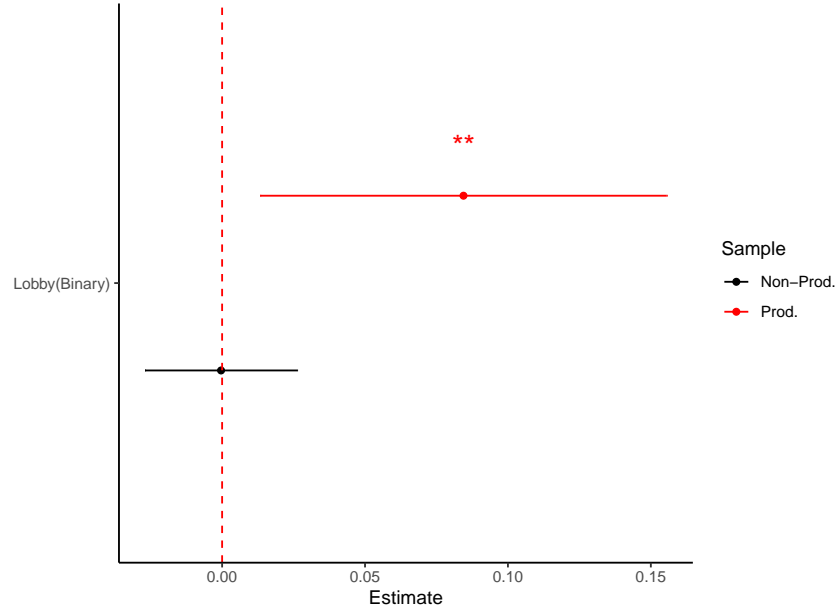


Figure 5: Extensive margin: Lobbying and Productivity

I observe that the results on the extensive margin is driven by the relatively more productive firms. Results suggest that the more productive firms are more likely to lobby on IPR while the impact for the non-productive firms neither statistically nor economically meaningful.

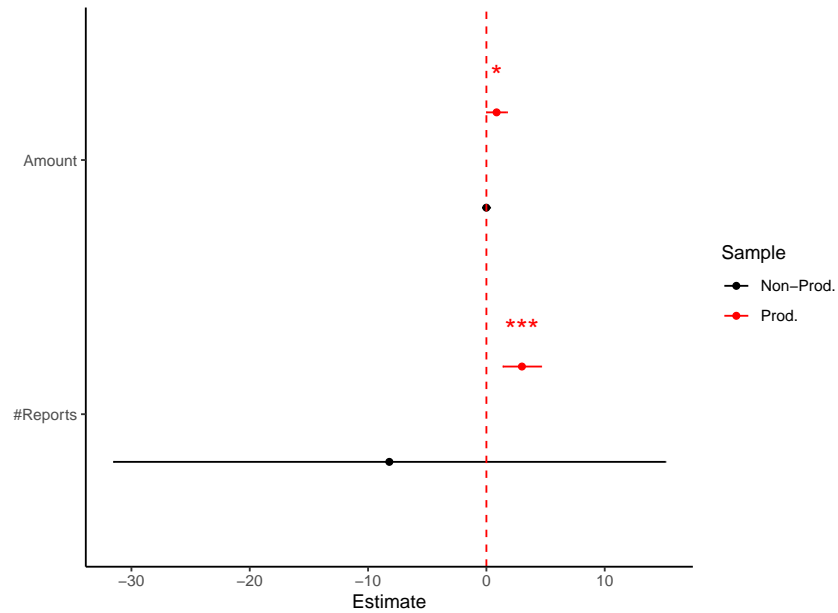


Figure 6: Intensive margin: Lobbying and Productivity

I also investigate the impact on the intensive margin. Figure 6 presents these results. Simi-

lar to extensive margin, more productive firms lobby more on IPR. Results at the extensive and intensive margin can be justified with the stakes in lobbying and fixed cost of lobbying. Since firms' incentive to participate lobbying activities depends on the potential impact of China's penetration on IPR related issues, it is natural to expect that firms with sufficiently high stakes in lobbying are more likely to lobby and lobby more.

Additionally, it is natural to expect that firms more intensively exposed to import penetration from China, lobby more. I investigate this claim by separating the industries into two group depending on their import shares. Industries are labelled as intensive if their import share from China is higher than the median import share at time t . Figure 7 reports the estimates from OLS with separating into sample into two groups.

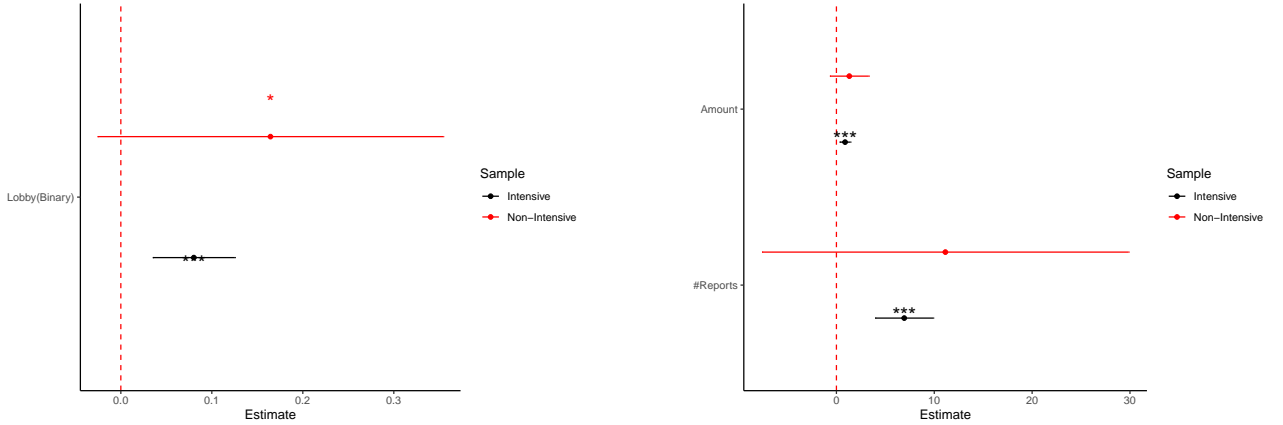


Figure 7: Non Intensive vs Intensive Import Penetration from China

Indeed, I observe that the firms operating in industries that are more intensively exposed to import penetration from China are more likely to lobby and lobby more on IPR. Corresponding 2SLS estimates of these analyses are reported in the Table 10 and Table 11.

5.1 Robustness Checks

Placebo Timing In order to strengthen the credibility of the results, I consider placebo timing. In line with the literature, I consider the period before 2007 for the baseline analysis.¹⁵ I claim that the impact of the import penetration from China is expected to be more

¹⁵ See e.g., Autor et al., 2013; Aghion et al., 2021; Caselli et al., 2021.

pronounced for the period before 2007. To check this claim, I limit my sample to the period between the years 2008-2015 for the placebo timing analysis. Table 4 present this results. Results suggest that there is no statistically meaningful impact of import penetration from China.

Table 4: Import penetration from China and IPR lobbying

	Lobby(Binary)	#Reports	Amount
Model:	(1)	(2)	(3)
	OLS	Poisson	OLS
<i>Variables</i>			
ImportShare	-0.0183 (0.0583)	2.174 (5.359)	-0.1800 (0.6084)
<i>Fixed-effects</i>			
SIC	Yes	Yes	Yes
Year	Yes	Yes	Yes
Controls	Yes	Yes	Yes
<i>Fit statistics</i>			
Observations	9,378	5,963	9,378
R ²	0.19576		0.18929
Pseudo R ²		0.65181	

Clustered (SIC3) standard-errors in parentheses. *Note:* *p<0.1; **p<0.05; ***p<0.01. Firm controls include log employment, log sales per worker, HHI, log patent stock, binary indicator takes value of 1 if firm lobbies on other issues at time t, binary variable for foreign income and the log of the rest of the employment.

Placebo Group I also consider placebo group. As a placebo outcome, I consider lobbying on other issues excluding trade and IPR related reports. Then, I aggregate lobbying amounts, binary lobbying behaviour and number of reports to the firm and year level. Table 5 presents this results. Results suggest that there is no statistically significant impact of import share.

Table 5: Import penetration from China and IPR lobbying

	Lobby(Binary)	#Reports	Amount
Model:	(1)	(2)	(3)
	OLS	Poisson	OLS
<i>Variables</i>			
ImportShare	-0.0824 (0.0515)	0.5273 (0.3261)	-1.216 (0.9400)
<i>Fixed-effects</i>			
SIC	Yes	Yes	Yes
Year	Yes	Yes	Yes
Controls	Yes	Yes	Yes
<i>Fit statistics</i>			
Observations	14,674	13,609	14,674
R ²	0.10056		0.10571
Pseudo R ²		0.23646	

Clustered (SIC3) standard-errors in parentheses. *Note:* *p<0.1; **p<0.05; ***p<0.01. Firm controls include log employment, log sales per worker, HHI, log patent stock, binary indicator takes value of 1 if firm lobbies on other issues at time t, binary variable for foreign income and the log of the rest of the employment.

6 Lobbying and Regulations

In this section, I focus on the impact of lobbying on regulations by using RegData from Al-Ubaydli and McLaughlin (2017). This database allows us to create industry-specific regulation indexes.¹⁶ In particular, I check the impact of trade lobbying at the industry-year level on industry-specific regulation index from trade related agencies' regulatory texts. The unit level of observation in this sample is industry (NAICS4)-year.¹⁷

In this section, I limit the regulation index measure to the trade related regulatory agencies such as Federal Trade Commission. I also limit the lobbying activities to the trade. I limit

¹⁶ More information is provided in Section 3.

¹⁷ Since I can observe the regulation indexes and lobbying at the NAICS level, I use NAICS as industry classification instead of SIC classification. I use SIC classification in the Section 5 since I utilize Compustat.

my sample to the manufacturing firms and years between 1999-2020. My results are robust to limiting the sample to the years between 1999-2007. These results can be found in the Table 12 in Appendix.

I estimate the impact of trade lobbying on industry-year specific regulation index. Table 6 presents the results. I show that there is a positive correlation between trade lobbying (binary and amount) regulation indexes. First two column shows the impact of binary trade lobbying on regulation indexes while the last two column uses amount of lobbying.

Table 6: Lobbying on trade and regulations

Dependent Variables:	Log(Restr.1)	Log(Restr.2)	Log(Restr.1)	Log(Restr.2)
Model:	(1)	(2)	(3)	(4)
<i>Variables</i>				
Lobby(Binary)	0.2264*** (0.0241)	0.2316*** (0.0244)		
Lobby(Amount)			0.0159*** (0.0021)	0.0163*** (0.0021)
<i>Fixed-effects</i>				
NAICS3	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes
Controls	No	No	No	No
<i>Fit statistics</i>				
Observations	1,738	1,738	1,738	1,738
R ²	0.42383	0.40960	0.42008	0.40567

Robust standard-errors in parentheses. *Note:* *p<0.1; **p<0.05; ***p<0.01.

To be able to construct casual relationship between trade lobbying and regulation index, I follow Ludema et al. (2018) and use lobbying on other issues at time t as an instrument for lobbying on trade for each industry j at time t. Table 7 presents 2SLS estimates.

Table 7: Import penetration from China and IPR lobbying

Dependent Variables:	Log(Restr.1)	Log(Restr.2)	Log(Restr.1)	Log(Restr.2)
Model:	(1)	(2)	(3)	(4)
<i>Variables</i>				
Lobby(Binary)	0.2790*** (0.0584)	0.2851*** (0.0584)		
Lobby Amount			0.0290*** (0.0039)	0.0294*** (0.0039)
<i>Fixed-effects</i>				
NAICS3	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes
Controls	No	No	No	No
<i>Fit statistics</i>				
Observations	1,738	1,738	1,738	1,738
R ²	0.42293	0.40867	0.41133	0.39681
First-Stage Estimates				
Lobby(Binary) Inst.	0.5110*** (0.0362)	0.5110*** (0.0362)		
Lobby(Amount) Inst.			0.6597*** (0.0271)	0.6597*** (0.0271)
F-test (1st stage)	199.13	199.13	591.88	591.88

Robust standard-errors in parentheses. *Note:* *p<0.1; **p<0.05; ***p<0.01.

Results in column 1 suggest that lobbying on trade increases the regulation index related to trade by almost 28 percentage points. The impact of lobbying expenditure is also statistically and economically significant. Kleibergen-Paap Wald F statistics are reported under the table and rule out the weak instrument concerns. I also consider control variables. By merging regulation data with NBER-CES Manufacturing Industry Database, Becker et al. (2021), I use logs of capital per labor, value added per worker and employment as control variables. I also control the export to import ratio of industries by gathering the data from Comtrade and utilizing concordance tables from Schott (2008). Results of these estimation can be found in the Table 13 in Appendix.

Although I observe a positive casual relationship between regulation restrictions and lob-

bying, these results do not provide a comprehensive understanding about the impact of lobbying on regulations. It is not possible to comment on the direct aim of lobbying on regulations due to aggregation of the lobbying reports without considering and clustering the aim of lobbying activities.¹⁸ However these results can be considered as a supporting evidence for the claims in Autor et al. (2020), Gutiérrez (2019) and Rodrik (2018).

7 Conclusion

This paper mainly investigates the impact of competition from China on lobbying related to IPR. By using the data of publicly listed firms and firm level federal lobbying reports in the US, I first show the link between patent ownership and lobbying on trade to motivate the baseline analysis. Then, I establish a causal link between import penetration from China and IPR lobbying.

I provide three main results. First I show that patent-owner firms dominate trade lobbying. Second, I demonstrate that firms are more engaged in lobbying on intellectual property rights (IPR) when they are exposed to trade shocks. Using the identification strategy of Autor et al. (2013), I establish a causal link between import penetration from China and IPR lobbying. According to the findings, firms are increasing their lobbying on intellectual property rights in response to Chinese import penetration. The findings also highlight the heterogeneous impact on lobbying. Firms operating in industries that were more intensively exposed to Chinese import penetration and more productive firms lobby more aggressively on IPR. Finally, I investigate how trade lobbying impacts regulations. I observe a positive link between lobbying and restrictions in the regulations.

There are multiple venues along which this paper can be extended. First, this paper can be extended to examine the impact of import penetration from China on campaign contributions. In addition, instead of considering only patent-ownership this study can also be extended to include trademarks and copyrights. Finally, the impact of the trade shock from China can be investigated by focusing on other lobbying subjects.

¹⁸ Unfortunately clustering of the aim of the lobbying activities or focusing on more dis-aggregated contents is not possible due to lack of details in the lobbying reports.

My results add another layer to the vast literature connecting trade shocks and firm responses by particularly focusing on the lobbying responses of the firms. By investigating the impact of lobbying on regulation restrictions, it also provides additional empirical evidences related to the returns on lobbying.

References

- Aghion, P., A. Bergeaud, M. Lequien, M. Melitz, and T. Zuber (2021). Opposing firm-level responses to the china shock: horizontal competition versus vertical relationships? *National Bureau of Economic Research No w29196*.
- Al-Ubaydli, O. and P. A. McLaughlin (2017). Regdata: A numerical database on industry-specific regulations for all united states industries and federal regulations, 1997–2012. *Regulation Governance*. 11(1), 109–123.
- Amiti, M. and J. Konings (2007). Trade liberalization, intermediate inputs, and productivity: Evidence from indonesia. *American Economic Review*. 97(5), 1611–1638.
- Arora, A., S. Belenzon, and S. L. (2021). Matching patents to compustat firms, 1980–2015: Dynamic reassignment, name changes, and ownership structures. *Research Policy* 50(5), 104217.
- Autor, D., D. Dorn, G. H. Hanson, G. Pisano, and P. Shu (2020). Foreign competition and domestic innovation: Evidence from us patents. *American Economic Review: Insights* 2(3), 357–374.
- Autor, D., D. Dorn, L. F. Katz, C. Patterson, and J. Van Reenen (2020). The fall of the labor share and the rise of superstar firms. *The Quarterly Journal of Economics* 135(2), 645–709.
- Autor, D. H., D. Dorn, and G. H. Hanson (2013). The china syndrome: Local labor market effects of import competition in the united states. *American economic review*. 103(6), 2121–2168.
- Autor, D. H., D. Dorn, and G. H. Hanson (2016). The china shock: Learning from labor market adjustment to large changes in trade. *Annual Review of Economics*. 8, 205–240.
- Becker, R. A., W. B. Gray, and J. Marvakov. (2021). Nber-ces manufacturing industry database (1958-2018, version 2021a). *NBER*.

- Bertrand, M., E. Duflo, and S. Mullainathan (2004). How much should we trust differences-in-differences estimates? *The Quarterly journal of economics* 119(1), 249–275.
- Blanes i Vidal, J., M. Draca, and C. Fons-Rosen (2012). Revolving door lobbyists. *American Economic Review*. 102(7), 3731–3748.
- Blanga-Gubbay, M., P. Conconi, I. S. Kim, and P. M. (2023). Lobbying on deep trade policies.
- Blanga-Gubbay, M., P. Conconi, and M. Parenti (2023). Lobbying for globalization. *CPER Discussion Paper No: 14597*.
- Bloom, N., M. Draca, and J. Van Reenen (2016). Trade induced technical change? the impact of chinese imports on innovation, it and productivity. *The review of economic studies*. 83(1), 87–117.
- Bombardini, M., O. C. Rendina, and F. Trebbi (2021). Lobbying behind the frontier. *National Bureau of Economic Research No w29120*..
- Bombardini, M. and F. Trebbi (2012). Competition and political organization: Together or alone in lobbying for trade policy? *Journal of International Economics* 87(1), 18–26.
- Bombardini, M. and F. Trebbi (2020). Empirical models of lobbying. *Annual Review of Economics*. 12(1), 391–413.
- Caselli, M., L. Nesta, and S. Schiavo (2021). Imports and labour market imperfections: firm-level evidence from france. *European Economic Review*. 131.
- de Figueiredo, J. M. and B. K. Richter (2014). Advancing the empirical research on lobbying. *Annual Review of Political Science*. 17, 163–185.
- Gawande, K. and U. Bandyopadhyay (2000). Is protection for sale? evidence on the grossman-helpman theory of endogenous protection. *Review of Economics and statistics* 82(1), 139–152.
- Goldberg, P. K. and G. Maggi (1999). Protection for sale: An empirical investigation. *American Economic Review* 89(5), 1135–1155.

- Grossman, G. M. and E. Helpman (1994). Protection for sale. *American Economic Review*. 84(4), 833–850.
- Gutiérrez, G., . P. T. (2019). The failure of free entry. *NBER Working Paper No. 26001*.
- Kang, K. (2016). Policy influence and private returns from lobbying in the energy sector. *Review of Economic Studies*. 83(1), 269–305.
- Kim, I. S. (2008). Political cleavages within industry: Firm-level lobbying for trade liberalization. *The American Political Science Review*. 111(1), 1–20.
- Kim, I. S. (2018). Lobbyview: Firm-level lobbying congressional bills database. *Unpublished manuscript, MIT, Cambridge, MA.*
- Kim, I. S. and H. V. Milner (2018). Multinational corporations and their influence through lobbying on foreign policy. *Multinational Corporations in a Changing Global Economy.*, 497–536.
- Ludema, R. D., A. M. Mayda, and P. Mishra (2018). Information and legislative bargaining: The political economy of us tariff suspensions. *Review of Economics and Statistics*. 100(2), 303–318.
- Mattoo, A., N. Rocha, and M. Ruta (2020). What do trade agreements really do? *Handbook of Deep Trade Agreements.*
- Pavcnik, N. (2002). Trade liberalization, exit, and productivity improvements: Evidence from chilean plants. *The Review of Economic Studies*. 69(1), 245–276.
- Rodrik, D. (2018). What do trade agreements really do? *Journal of economic perspectives* 32(2), 73–90.
- Schott, P. K. (2008). The relative sophistication of chinese exports. *Economic Policy*. 23(53), 6–49.
- Shu, P. and C. Steinwender (2019). The impact of trade liberalization on firm productivity and innovation. *Innovation Policy and the Economy*. 19(1), 39–68.

Appendices

A Figures and Tables

LD-2 Disclosure Form

26.05.2021 17:00

Clerk of the House of Representatives Legislative Resource Center 135 Cannon Building Washington, DC 20515 http://lobbyingdisclosure.house.gov	Secretary of the Senate Office of Public Records 232 Hart Building Washington, DC 20510 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 <input checked="" type="checkbox"/> Organization/Lobbying Firm <input type="checkbox"/> Self Employed Individual JOHNSON & JOHNSON SERVICES, INC.			
2. Address Address1 ONE JOHNSON & JOHNSON PLAZA Address2 City NEW BRUNSWICK State NJ Zip Code 08933 Country USA			
3. Principal place of business (if different than line 2) City State Zip Code Country			
4a. Contact Name Mr. CLIFFORD HOLLAND		b. Telephone Number 7325242884	c. E-mail chollan@its.jnj.com
7. Client Name <input checked="" type="checkbox"/> Self <input type="checkbox"/> Check if client is a state or local government or instrumentality JOHNSON & JOHNSON SERVICES, INC.		5. Senate ID# 20686-12	
		6. House ID# 303480000	

TYPE OF REPORT 8. Year 2012 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 <input type="checkbox"/> \$5,000 or more <input type="checkbox"/> \$ Provide a good faith estimate, rounded to the nearest \$10,000, of all lobbying related income for 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 <input type="checkbox"/> \$5,000 or more <input checked="" type="checkbox"/> \$ 2,260,000.00 14. REPORTING Check box to indicate expense accounting method. See instructions for description of options. <input checked="" type="checkbox"/> Method A. Reporting amounts using LDA definitions only <input type="checkbox"/> Method B. Reporting amounts under section 6033(b)(8) of the Internal Revenue Code <input type="checkbox"/> Method C. Reporting amounts under section 162(e) of the Internal Revenue Code
Signature Digitally Signed By: Clifford Holland, Corporate Vice President, Government Affairs and Policy	Date 04/20/2012

<https://lda.senate.gov/filings/public/filing/c81dcc8c-275b-4641-9d66-407ba854da57/print/>

Sayfa 1 / 13

Figure 8: An example of lobbying report

Table 8: Import penetration from China and IPR lobbying-No controls

Model:	OLS			2SLS		
	Lobby(Binary)	#Reports	Amount	Lobby(Binary)	#Reports	Amount
	(1)	(2)	(3)	(4)	(5)	(6)
	OLS	Poisson	OLS	OLS	Poisson	OLS
<i>Variables</i>						
ImportShare	0.0576*** (0.0194)	3.934*** (0.9381)	0.6239*** (0.2342)	0.0909*** (0.0243)	4.375*** (0.8958)	1.026*** (0.2954)
<i>Fixed-effects</i>						
SIC	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	No	No	No	No	No
<i>Fit statistics</i>						
Observations	14,674	8,823	14,674	14,668	8,823	14,668
R ²	0.03582		0.03557	0.03616		0.03594
Pseudo R ²		0.10977			0.10983	
Coef-Instrument				1.0705*** (0.041)	1.0738*** (0.0324)	1.0705*** (0.041)
F-test (1st stage)				682.1	1,101.1	682.1

Clustered (SIC3) standard-errors in parentheses. *Note:* *p<0.1; **p<0.05; ***p<0.01.

Table 9: Import penetration from China and IPR lobbying-Probit

Model:	Probit	
	Lobby(Binary)	
	(1)	(2)
<i>Variables</i>		
ImportShare	2.244*** (0.6546)	2.359*** (0.8279)
<i>Fixed-effects</i>		
SIC	Yes	Yes
Year	Yes	Yes
Controls	Yes	Yes
<i>Fit statistics</i>		
Observations	8,823	8,823
Pseudo R ²	0.50507	0.50488
Coef-Instrument		1.0636*** (0.0304)
F-test (1st stage)		166.8

Clustered (SIC3) standard-errors in parentheses. *Note:* *p<0.1; **p<0.05; ***p<0.01. Firm controls include log employment, log sales per worker, HHI, log patent stock, binary indicator takes value of 1 if firm lobbies on other issues at time t, binary variable for foreign income and the log of the rest of the employment.

Table 10: Import penetration from China and IPR lobbying-Productivity

	Lobby(Binary)	#Reports	Amount
Model:	(1)	(2)	(3)
	OLS	Poisson	OLS
<i>Variables</i>			
ImportShare	0.1495*** (0.0456)	3.295*** (1.156)	1.668*** (0.5660)
<i>Fixed-effects</i>			
SIC	Yes	Yes	Yes
Year	Yes	Yes	Yes
Controls	Yes	Yes	Yes
<i>Fit statistics</i>			
Observations	7,590	4,416	7,590
R ²	0.16615		0.16803
Pseudo R ²		0.62362	
Coef.-Instrument	1.0521*** (0.0339)	1.0684*** (0.0304)	1.0521*** (0.0339)
F-test (1st stage)	964.7	263.5	964.7

Clustered (SIC3) standard-errors in parentheses. *Note:* *p<0.1; **p<0.05; ***p<0.01. Firm controls include log employment, log sales per worker, HHI, log patent stock, binary indicator takes value of 1 if firm lobbies on other issues at time t, binary variable for foreign income and the log of the rest of the employment.

Table 11: Import penetration from China and IPR lobbying-Import Intensity

	Lobby(Binary)	#Reports	Amount
Model:	(1)	(2)	(3)
	OLS	Poisson	OLS
<i>Variables</i>			
ImportShare	0.1419*** (0.0382)	8.624*** (2.306)	1.663*** (0.4670)
<i>Fixed-effects</i>			
SIC	Yes	Yes	Yes
Year	Yes	Yes	Yes
Controls	Yes	Yes	Yes
<i>Fit statistics</i>			
Observations	5,848	2,404	5,848
R ²	0.13286		0.13902
Pseudo R ²		0.70110	
Coef.-Instrument	0.8796*** (0.0763)	0.849*** (0.0968)	0.8796*** (0.0763)
F-test (1st stage)	132.9	87.54	132.9

Clustered (SIC3) standard-errors in parentheses. *Note:* *p<0.1; **p<0.05; ***p<0.01. Firm controls include log employment, log sales per worker, HHI, log patent stock, binary indicator takes value of 1 if firm lobbies on other issues at time t, binary variable for foreign income and the log of the rest of the employment.

Table 12: Trade Lobbying and Regulation Index-Until 2007

Dependent Variables:	Log(Restr.1)	Log(Restr.2)	Log(Restr.1)	Log(Restr.2)
Model:	(1)	(2)	(3)	(4)
<i>Variables</i>				
Lobby(Binary)	0.3077*** (0.0903)	0.3145*** (0.0902)		
Lobby(Amount)			0.0295*** (0.0062)	0.0304*** (0.0062)
<i>Fixed-effects</i>				
NAICS3	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes
Controls	No	No	No	No
<i>Fit statistics</i>				
Observations	711	711	711	711
R ²	0.44303	0.42527	0.42495	0.40672

Robust standard-errors in parentheses. *Note:* *p<0.1; **p<0.05; ***p<0.01.

Table 13: Trade Lobbying and Regulation Index-Controls

Dependent Variables:	Log(Restr.1)	Log(Restr.2)	Log(Restr.1)	Log(Restr.2)
Model:	(1)	(2)	(3)	(4)
<i>Variables</i>				
Lobby(Binary)	0.2503*** (0.0688)	0.2542*** (0.0687)		
Lobby(Amount)			0.0187*** (0.0057)	0.0190*** (0.0058)
<i>Fixed-effects</i>				
NAICS3	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes
Controls	No	No	No	No
<i>Fit statistics</i>				
Observations	1,482	1,482	1,482	1,482
R ²	0.44768	0.43275	0.43833	0.42318

Robust standard-errors in parentheses. *Note:* *p<0.1; **p<0.05; ***p<0.01. Controls include logs of employment, capital to employment, value added per worker and export to import ratio.