Globalization for Sale*

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Abstract
We study the political economy of trade agreements with heterogeneous firms. Using detailed information from lobbying reports filed under the Lobbying Disclosure Act, we find that virtually all firms that lobby on free trade agreements (FTAs) are in favor of their ratification. Moreover, lobbying firms are larger and more likely to be engaged in international trade than non-lobbying firms. To rationalize these findings, we develop a theoretical model in which heterogeneous oligopolistic firms choose whether to lobby and how much to spend in favor or against the ratification of a proposed FTA, when they are uncertain about legislators’ stance on the agreement. We derive conditions under which the most productive firms select into lobbying and support the ratification of the agreement, while less productive firms remain unorganized. The model delivers predictions about the intensive margin of lobbying. In line with these predictions, we find that i) larger firms spend more in support of FTAs, and ii) individual firms spend more on agreements that generate larger potential gains – in terms of reduction in the tariffs on their final goods and intermediate inputs, the depth of the agreement, and the export and sourcing potential of the FTA partners – and iii) when legislators are less likely be in favor of ratification.

JEL classifications: F13, F53, F61.

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1 Introduction

Recent decades have seen a proliferation of regional trade agreements. There are currently more than 300 of these agreements in force, with many more being negotiated, most of which take the form of free trade agreements (FTAs). For example, the United States has 14 FTAs in force with 20 countries, including the North American Free Trade Agreement (NAFTA) and the US-Korea Free Trade Agreement (KORUS).

What political interests lead to the ratification of these agreements? The workhorse model of the political economy of FTAs focuses on the role of lobbying by industry groups (Grossman and Helpman, 1995a). However, most lobbying is actually done by individual firms rather than industries. Moreover, even within narrowly defined sectors, firms differ in their participation in international trade (e.g. Bernard and Jensen, 1999; Melitz, 2003; Antràs et al., 2017), which can lead to heterogeneous preferences over trade agreements.

In this paper, we study the political economy of trade agreements with heterogeneous firms. First, using detailed information from lobbying reports available under the Lobbying Disclosure Act of 1995, we construct a unique dataset that allow us to trace firms’ lobbying expenditures on FTAs negotiated by the United States (US). The reports provide information on the identity of the lobbying firm, how much it spent, and whether it supported or opposed a particular trade agreement. Our main dataset is based on all reports that explicitly mention the bills for the ratification of FTAs in Congress. This methodology makes it possible to identify lobbying on specific types of trade policies. It also allows us to focus on the final version of a trade agreement, and examine whether firms lobby in favor or against its implementation.

Using this dataset, we uncover new facts about firms lobbying on trade agreements. First, virtually all lobbying firms are in favor of FTAs: in 99.25% of the cases, firms lobby in support of trade agreements. This finding continues to hold if we use keywords rather than bill numbers to track all lobbying reports related to a particular trade agreement. We then match our lobbying dataset with Compustat and document two additional facts concerning the extensive margin of lobbying: firms lobbying on FTAs are larger and more likely to be engaged in international trade than non-lobbying firms.

These facts cannot be explained by the existing literature on the political economy of trade

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1 In the WTO, regional trade agreements are defined as reciprocal trade agreements between two or more partners. They include free trade agreements and customs unions. As of 1 February 2019, 310 RTAs were in force. These correspond to 459 notifications from WTO members, counting goods, services and accessions separately (WTO Secretariat).

2 Total spending on FTAs by manufacturing firms is more than ten times larger than spending by industry groups.

3 For example, Mayda et al. (2017) use bill numbers to trace lobbying reports related to MFN tariff suspensions.

4 This allows us to capture lobbying that occurred during the negotiation of an agreement, before it was signed by the President and being considered for ratification in Congress. Using this alternative methodology, we can also examine lobbying on agreements that never reached the ratification stage. For example, the Trans-Pacific Partnership (TPP) was signed by President Obama on 4 February 2016, but never reached the ratification phase (President Trump withdrew from the agreement on his first day in office).
agreements. As mentioned above, the workhorse model by Grossman and Helpman is focused on industries rather than firms. Moreover, the decision to lobby is exogenous: it is simply assumed that some industries are organized, while others aren’t. Finally, contributions are paid ex-post (i.e. after the incumbent government has decided whether or not to ratify the agreement), while actual lobbying expenditures are paid ex-ante (i.e. before the ratification of the agreement).

To rationalize the patterns observed in our data, we develop a new model of the political economy of trade agreements with heterogeneous firms. Explaining lobbying by individual firms requires a model in which firms have positive mass and can thus affect policy outcomes. We thus consider a two-country model in which oligopolistic firms compete in a (discrete) number of sectors of the economy. Our model generalizes Brander and Krugman (1983)’s, by allowing for firm heterogeneity and selection into exporting. We examine the effects of a FTA, which leads to the reciprocal elimination of tariffs across all sectors. The entry into force of the trade agreement creates winners and losers. Non-exporting firms always lose. Among them, the productive one surviving after the trade agreement loses the most. Exporting firms may gain or lose, depending on whether the benefits due to improved access to the foreign market outweigh the losses due to increased competition in the domestic market. The most productive exporting firm experiences the largest gains (smaller losses).

The political structure of the model is characterized by two key features. First, in line with what we observe in the data, lobbying expenditures are paid before the policy outcome is realized. To model ex-ante lobbying, we follow the literature on lobbying/rent-seeking in contests (e.g. Tullock, 1980; Becker, 1983; Esteban and Ray, 2001). Firms decide whether to pay a fixed lobbying cost to be politically organized and how much to lobby in favor or against a proposed FTA, anticipating the impact of their lobbying expenditures on the probability that their preferred outcome is realized. Second, legislators deciding on the ratification of the FTA may be biased in favor or against it, and there is some uncertainty about this political bias. Introducing this bias is equivalent to adding in each country a random contribution by a player who can be in favor or against the agreement. This feature of our model captures the political uncertainty faced by firms when making their lobbying decisions. It also allows us to rule out trivial Nash equilibria where firms in both countries would choose not to lobby.

This model provides a simple rationale for our key empirical finding that virtually all lobbying

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5In the Theoretical Appendix, we also consider a mixed market structure, in which a few heterogeneous oligopolistic firms coexist with a continuum of monopolistically competitive firms, as in Parenti (2018).

6This is in line with Article XXIV of the GATT/WTO, which allows countries to negotiate preferential trading arrangements, but requires them to eliminate “the duties and other restrictive regulations of commerce” on “substantially all the trade between the constituent territories in products originating in such territories.”

7Even after trade agreements have been signed by the President, US congressmen often oppose their ratification. Support for ratification varies across legislators, depending on many factors, including their party affiliation and whether it coincides with the President’s, whether they are members of the House or Senate, and their proximity to elections (Conconi et al., 2014). When making their lobbying decisions on FTAs, firms may thus be uncertain about whether there is a majority in favor in both houses of Congress, which is required for the agreement to be ratified.
firms are in favor of trade agreements. We derive conditions under which the most productive firms select into lobbying and support the ratification of the FTA, while less productive firms cannot cover the fixed lobbying costs and remain unorganized. In equilibrium, two types of free riding arise: on the extensive margin, non-organized pro-FTA firms benefit from the efforts of firms that lobby in favor of the agreement; on the intensive margin, each organized pro-FTA firm benefits from the efforts of other lobbying firms.

The model is also consistent with the other facts that emerge from our dataset concerning the extensive margin of lobbying. In particular, it can explain why lobbying on trade agreements is a rare event – even among publicly traded companies – and why lobbying firms are larger and more likely to be engaged in trade than non-lobbying firms.

We then characterize the intensive margin of lobbying and derive three testable predictions about lobbying expenditures by pro-FTA firms. First, larger firms should spend more lobbying in support of trade agreements. Second, individual firms should spend more when their potential gains from the improved access to the foreign market are larger. Third, lobbying expenditures should increase in the probability that legislators are biased against ratifying the agreement. Intuitively, when politicians are more likely to be in favor of the agreement, firms tend to free ride on their political bias, thereby decreasing their contributions.

To assess the validity of these predictions, we exploit both cross-firm and within-firm variation in lobbying expenditures on trade agreements. In line with the first prediction, we find that larger firms spend more in favor of the ratification of FTAs. We also find strong empirical support for the second prediction: individual firms spend more supporting FTAs when their potential gains from the agreement are larger – in terms of the reduction in the tariffs they face to export their final goods and import their intermediate inputs, the depth of the agreement, and the export and sourcing potential of the FTA partners. Finally, individual firms spend more in support of FTAs when US congressmen are less likely to be in favor of ratification, in line with the third prediction of our model.

Our results differ from the standard view that trade liberalization efforts are met by staunch opposition. Given that FTAs are reciprocal and involve multiple sectors, they can reduce both the cost of exporting final goods and importing intermediate inputs. It is thus not surprising that large firms, which select into exporting and importing, push for their ratification.\footnote{This is not to say that large firms are always in favor of free trade. Indeed, some of the firms that lobby in favor of FTAs may support unilateral and product-specific protectionist policies. For example, US Steel Corporation lobbied in favor of KORUS (see Figure A-8 in the Empirical Appendix), but regularly petitions for antidumping and countervailing duties targeted against key foreign competitors.}

Our findings resonate with Rodrik (2018)’s argument that “trade agreements are the result of rent-seeking, self-interested behavior on the part of politically well-connected firms.” Although Rodrik focuses on “deep” trade agreements – covering non-tariff issues such as investment and intellectual property rights – the same argument applies to “traditional” trade agreements – which
eliminate tariffs among member countries. We show that lobbying on FTAs is dominated by a few large firms engaged in exporting and global sourcing, which can greatly benefit from tariff reductions on their final goods and intermediate inputs.\footnote{For example, as a result of the entry into force of the US-Korea Free Trade Agreement (KORUS), US soybeans producers face no tariff when exporting to Korea (compared to the 487 percent tariff they faced before KORUS).} On the intensive margin, we find that the level of pre-agreement tariffs on final and intermediate goods is a key determinant of firms’ lobbying expenditures on FTAs.

The rest of the paper is structured as follows. Section 2 briefly discusses the related literature. Section 3 describes the data used in our empirical analysis. In Section 4 we document some novel facts about firms lobbying on FTAs. Section 5 presents our theoretical model. In Section 6 we assess the validity of the model’s predictions concerning the intensive margin of lobbying. Section 7 concludes and discusses avenues of future research.

\section{Related Literature}

Our analysis is related to three main streams of literature. First, we build on the literature on the political economy of trade policy and in particular on those studies focused on the impact of lobbying on trade policy outcomes. The workhorse theoretical framework in this area is the protection for sale (henceforth PFS) model of Grossman and Helpman (1994). This model emphasizes the interactions between lobby groups representing industry special interests and an incumbent government. In a perfectly competitive setting, industry lobbies promise campaign contributions to the government as a function of potential trade policies; the government chooses trade policy so as to maximize a weighted sum of campaign contributions and aggregate welfare. Grossman and Helpman (1994) considers the unilateral trade policy choice of a small country, while Grossman and Helpman (1995b) extends the analysis to trade negotiations between two large countries. Our paper is closer to Grossman and Helpman (1995a), which focuses on the political economy of free trade agreements.

These seminal contributions have stimulated a large literature on the political economy of trade policy. Using cross-sectional data on US non-tariff barriers and PAC data on industry-level campaign contributions, Goldberg and Maggi (1999) and Gawande and Bandyopadhyay (2000) find that the patterns of protection are broadly consistent with the predictions of Grossman and Helpman (1994). Other studies have extended the PFS model along several dimensions, e.g. allowing industry lobby formation to be endogenous (Mitra, 1999), or introducing an oligopolistic market structure (Ornelas, 2005). Bombardini (2008) is the first paper to consider the role of firms. In her model, heterogeneous firms can contribute to a sector lobby, with the goal of influencing a unilateral and sector-specific trade policy (import tariff).\footnote{The sector lobby considers the entry of a marginal firm into the lobby, which increases the sector tariff proportionally to the firm’s size; if the net return from this addition to the interest group is smaller than the fixed cost of lobbying, then the firm is excluded from the sector’s lobby.} As in Grossman and Helpman (1994), lobbying...
contributions are paid ex-post, once the government has made the policy choice. The key prediction of her model is that sectors with a higher share of firms above a given size exhibit higher intensity of political activity. To assess the validity of this prediction, she uses data on PAC contributions and finds that industries characterized by higher firm size dispersion obtain a higher level of protection. Our paper differs from Bombardini’s along several dimensions. First, we study endogenous lobbying by individual firms. Second, we focus on the political economy of trade agreements, which are reciprocal and cover multiple sectors. Third, in our model, firms pay lobbying expenditures ex ante, before the policy outcome is realized. Finally, we use detailed data on lobbying expenditures, which (unlike PAC data) allow tracing lobbying on specific policy issues. More generally, our paper contributes to the literature on the political economy of trade policy by uncovering novel facts about firms lobbying on FTA and developing a new theoretical model in which heterogeneous firms choose whether to lobby and how much to spend in favor or against trade agreements.

Our analysis is also related to the literature on firm heterogeneity in international trade. This literature emphasizes selection effects in firms’ decisions to export (e.g. Bernard and Jensen, 1999; Melitz, 2003), establish foreign subsidiaries (e.g. Helpman, Melitz and Yeaple, 2004) and source inputs from foreign suppliers (e.g. Bernard et al., 2007; Antrás et al., 2017). The bulk of this literature focuses on a setting with a continuum of monopolistically competitive firms. To explain lobbying by individual firms, we consider instead a setting with heterogeneous oligopolistic firms and a discrete number of sectors. In this setting, firms can affect both market and political outcomes.

The political structure of our model builds on the large literature on lobbying/rent-seeking in contests (e.g. Tullock, 1980; Becker, 1983; Esteban and Ray, 2001; Epstein and Nitzan, 2006; Jia et al., 2013; Bouton et al., 2018). Employing a contest success function allows us to capture lobbying that occurs ex ante, when firms are uncertain about whether a trade agreement will be ratified. In this literature, the paper closest to ours is Cole et al. (2018). They describe a two-country model of trade agreements in which pro- and anti-trade interest groups in each country try to influence their government’s ratification decision. In line with their approach, we model lobbying on trade agreements as a “parallel” contest: given that the entry into force of a bilateral FTA requires ratification by both governments, lobbying in one country depends on the probability of ratification in the other country. The key novelty of our model is that we endogenize lobbying

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11 Other contributions in this literature include, among many others, Chang (2005), who develops a model featuring Dixit-Stiglitz setup with homogenous firms. and Matschke and Sherlund (2006), who introduce collective bargaining, differences in inter-industry labor mobility, and trade union lobbying. Gawande et al. (2006) consider the role of foreign lobbying, while Gawande et al. (2012) investigate the consequences of lobbying competition between upstream and downstream producers. Bombardini and Trebbi (2012) study the choice of firms to lobby individually or through a trade association. Using information on firms’ public statements, Osgood (2015) documents that industries have internal disagreements about trade liberalization. Kim (2017) shows that more productive exporting firms are more likely to lobby to reduce tariffs, especially when their products are sufficiently differentiated.

12 We depart from models of oligopolistic competition with a continuum of sectors (e.g. Atkeson and Burstein, 2008; Hottman et al., 2016; Neary 2016; Gaubert and Itskhoki, 2018), in which firms are “big in the small” (at the sectoral level), but “small in the big” (at the economy-wide level). Assuming a discrete number of sectors implies that firms are “big in the big” and can thus affect economy-wide policies, such as the ratification of trade agreements.
decisions by individual firms, which allows us to derive results about the extensive and intensive margin of firm lobbying of FTAs.

3 Data

3.1 Lobbying Dataset

We construct a novel dataset on lobbying expenditures that allows us to trace the payments firms make to influence the passage of trade agreements. We compile this dataset using the lobbying reports available under the Lobbying Disclosure Act (LDA) of 1995. This Act requires individuals and organizations to provide information on their lobbying activities at the federal level. Such activities generally encompass all efforts to influence the thinking of legislators or other covered federal officials for or against a specific cause. They include lobbying contacts and efforts in support of such contacts, including preparation and planning activities, research and other background work. Starting from 1996, all lobbyists have to file semi-annual reports to the Secretary of the SOPR, listing the name of each client (firm) and the total income they have received from each of them. All firms with in-house lobbying departments are required to file similar reports stating the total dollar amount (i.e., both for in-house and outside lobbying) they have spent. Semi-annual lobbying disclosure reports can be found on the website of the Center for Responsive Politics (CRP) and in the Senate’s Office of Public Records (SOPR). Lobbying reports filed prior 2008 are not available in scannable pdf format, and some of them are digital versions of handwritten documents. Starting from 2008, following the Honest Leadership and Open Government Act of 2007, lobbying reports are filed electronically at the quarterly level.

Earlier empirical studies on the political economy of trade policy use data on campaign contributions to classify sectors into politically organized or not (e.g. Goldberg and Maggi, 1999; Gawande and Bandyopadhyay, 2000). There are two key advantages of using lobbying reports. First, data on lobbying expenditures allows us to directly trace the issues targeted by lobbyists, which is not possible for data on contributions. This is because the Lobbying Disclosure Act of 1995 requires the disclosure not only of the amounts actually received/spent, but also of the issues for which lobbying is carried out. Second, lobbying expenditures are the most important channel of political influence, more than ten times larger than PAC contributions (see Figure A-1 in the Empirical Appendix).

We examine lobbying by individual firms on trade agreements negotiated by the United States since the Lobbying Disclosure Act. Following earlier studies focused on other policies (e.g. Kang,

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13 Cole et al. (2018) consider lobbying on trade agreements under a specific factors model, a monopolistic competition model à la Melitz, and an oligopoly model with two heterogeneous firms in each country. They study lobbying by pro- and anti-trade groups, while we are interested in explaining lobbying decisions by individual firms.

14 When filing its report, a firm has to choose the issue(s) it lobbied on from a list of 76 general issues (trade being one of them), and must indicate at least one specific issue (e.g. ratification of a particular trade agreement).
we use bill numbers to track reports related to the FTAs. Our main sample is based on all reports filed by firms that explicitly mention the FTA ratification bills in the House and Senate. This allows us to focus on the final version of a trade agreement, and examine whether firms lobby in favor or against its implementation.

Each report in our dataset provides information on the identity of the lobbying firm and the amount of expenditures on a specific trade agreement. A firm can lobby directly (through its own lobbying department) or indirectly (through a lobbying company).

The LDA requires organizations that employ lobbyists to register with the federal government and to disclose their lobbying expenditures on a regular basis, and imposes significant civil and criminal penalties for violations of its requirements. Section 4 of the LDA requires all organizations to register if they want to be involved in lobbying activities. Section 5 of the LDA specifies the criteria for reporting lobbying expenditures and requires all firms/lobbying firms to report their lobbying expenditure every quarter, even if they are below $5,000.

To link the expenditures to a particular agreement, we use information contained in Sections 15 and 16 of each report, in which firms have to declare the general and specific issues to which their lobbying activities are associated. All the reports in our main sample mention trade as a general issue and the FTA ratification bills as a specific issue. In most cases (91.4%), other issues are also mentioned. Since the lobbying reports do not provide a breakdown of the expenditures by issue, we follow a procedure similar to Mayda et al. (2017) to define the share of expenditures associated with the FTA ratification. First, we count the number of general issues in each lobbying report. Second, we verify whether the FTA ratification bill was also mentioned, as a specific issue, in a general issue other than trade (this occurs in 12% of the instances). For each report, we divide equally the reported expenditure by the number of general issues and then multiplying this amount

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15 See Table A-2 in the Empirical Appendix for a list of all the FTAs that have been ratified during our sample period and the corresponding bill numbers.

16 All the trade agreements in our sample have been negotiated under Fast Track Authority, which implies that US congressmen cannot amend them, but can only vote up or down on their ratification (see Conconi et al., 2012). Although our analysis is focused on lobbying by individual firms, we have collected all lobbying reports related to FTA ratification bills. These include reports filed by firm associations and trade unions (see Figure A-3).

17 In the first case, the firm reports its name and address in Sections 1-2 of the report and the amount of the lobbying expenses in Section 1-3. In the second case, the registrant is the lobbying firm, which reports the amount received by the firm as income in Section 1-2. Direct lobbying is the prevalent mode (see Table A-1): in more than 70% of the cases, firms use their own lobbying department to influence the ratification of FTAs; in the remaining cases, they use lobbying firms (22.99%) or combine the two modes (6.57%). There is no evidence that firms coordinate their lobbying efforts by using the same lobbying firm: there are 37 lobbying firms in our database; in 70.3% of the instances, these firms lobby on behalf of a single client; in the other cases, the clients operate in very different sectors.

18 An organization whose employees engage in lobbying activities on its own behalf has to register if its overall lobbying expenses (not on a specific issue) during the quarter exceed $10,000. In the case of lobbying firms, they have to register if their total income for matters related to lobbying activities on behalf of a particular client exceeds $2,500. The LDA also specifies that, if a lobbying firm represent many companies on the same issue, the client (to which the $2,500 registration threshold applies) is “the coalition or association and not its individual members.”

19 In this case, they do not have to specify the exact amount. In our lobbying dataset, there are a few firms/lobbying firms reporting lobbying expenditures of “less than $5,000” in one quarter.
by the number of times the ratification of the FTA was mentioned as a specific issue.\textsuperscript{20} Given that individual firms tend to file multiple reports on the same agreement, we then sum up the amounts each firm spent in a given year on a particular agreement. The variable $\text{Lobbying Expenditure}_{f,j,a,t}$ is the amount (in US dollars) that firm $f$, producing good $j$, spent on the ratification of agreement $a$ in year $t$.

Figures A-6[A-8] in the Empirical Appendix provide three examples of lobbying reports. The first was filed by Daimler Chrysler during the first semester of 2004. The firm reports having spent $2,466,317 lobbying on two general issues: Automotive and Trade. The House and Senate bills for the ratification of the US-Australia free trade agreement are mentioned as a specific issue under Trade, but not under Automotive. In this case, we thus consider that the firm spent $1,233,158.5 on the ratification of the US-Australia Free Trade Agreement.\textsuperscript{21}

The second example is a report by Philip Morris, which in 2008 paid $1,020,000 to support the implementation of the United States-Colombia Free Trade Agreement. Interestingly, this FTA was not ratified before the end of the Congressional session in December 2008. The third is a report filed by US Steel Corporation, which in 2011 paid $800,000 to support the ratification and implementation of the US-Korea Free Trade Agreement (KORUS). All these companies have subsidiaries around the world and engage in both import and export activities.

Our main lobbying database contains 803 reports related to the ratification of 12 trade agreements, which were filed by 112 firms between 2001 to 2012. We collapse the data at the firm-FTA-year level. Table A-1 provides some descriptive statistics at the firm-FTA level on lobbying expenditures, number of reports filed, and mode of lobbying. On average, individual firms spent $290,555 on the ratification of a FTA. Firms usually lobby on the same agreement more than once: the average number of reports for each ratification bill is 2.899. In most cases, firms lobby directly: in 70.44% of the cases the registrant is the firm. In the remaining cases, firms use a lobbying firm (22.99%) or combine the two lobbying modes (6.57%).

To determine whether the lobbying firm supported or opposed the agreement, we use the information contained in Section 16 of the report. For example, the report by Philip Morris mentioned above states that the firm lobbied “to implement the United States-Colombia Free Trade Agreement.” When information on the firm’s position is missing, the coding is based on official statements (e.g. company websites, public statements). For example, Section 16 of the above-mentioned report filed in 2004 by Daimler Chrysler does not explicitly mention the firm’s position on the US-Australia free trade agreement. However, DaimlerChrysler was one of the three members of the Automotive

\textsuperscript{20} For example, if a firm lobbied on four different general issues, and the ratification of a FTA was mentioned (as a specific issue) in two out of the four general issues, we allocate half of the reported lobbying expenditure to the FTA.

\textsuperscript{21} Notice that this lobbying report, filed prior 2008, is in a non-digitalized format. This example also illustrates the fact that lobbying companies can be foreign owned: Chrysler Corporation was founded in 1925 in Detroit; from 1998 to 2007 it was incorporated in the German multinational Daimler-Benz AG, in a so-called “Merger of Equals,” forming DaimlerChrysler AG.
Trade Policy Council (ATPC), which strongly supported the agreement. In all but two cases, we can code the firm’s position on the FTA based on information from the reports or official company statements. We exclude these cases from our analysis.

Our main dataset is based on firms lobbying on FTA ratification bills. As a robustness check, we use keywords rather than bill numbers to track lobbying reports related to a particular trade agreement. This methodology is less efficient than the one based on ratification bill numbers but allows us to consider lobbying expenditures in earlier stages of the FTA negotiations. We can also apply this methodology to study lobbying on FTAs that did not reach the ratification stage.

3.2 Matched Dataset

To obtain additional information about lobbying and non-lobbying firms, we have matched our dataset with Compustat. This database from Standard and Poors provides extensive information on publicly listed firms since the 1950s. We were able to match 89% of the firms in our lobbying dataset with firms in Compustat using the Company Name. Among the unmatched lobbying firms are some of the largest privately held companies of the United States. The matched dataset contains 114,412 firm-FTA-year observations, covering the period 2001-2012.

3.3 Firm Variables

The Fundamentals segment of Compustat provides information about firm size, in terms of sales and employment. The variable $Sales_{f,t}$ is total sales (in millions of US dollars) by firm $f$ in year $t$. The variable $Employment_{f,t}$ is the total number of employees (in thousands) of firm $f$ in year $t$.25

This segment also contains information on a company’s main activity, based on its reported Standard Industrial Classification (SIC) code and North American Industry Classification System (NAICS) code. Using this information, we create the dummy Tradable sector, which is equal to 1 for firms operating in tradable sectors. To identify tradable sectors, we use the classification by Mian and Sufi (2014), who provide two independent methods of industry classification which serve as a cross-check on each other.26

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22 The Automotive Trade Policy Council (ATPC) is a Washington, DC-based nonprofit trade association that represents the common international economic, trade, and investment interests of its member companies: General Motors Corp., Ford Motor Co., and DaimlerChrysler Corp. ATPC supports the U.S.-Australia FTA, asserting that it will benefit the U.S. industry by allowing for greater integration of its members’ operations, promoting growth and efficiency in ARFC members’ operations in both the U.S. and Australia” (statement made by Stephen J. Collins, President of ATPC, contained in Report 3697 of the United States International Trade Commission).

23 For example, to collect lobbying reports related to the US-Korea FTA, we had to use several different keywords as KORUS, US-Korea FTA, United States Korea Free Trade Agreement. Using the keyword search might also lead to include reports that refer to the bilateral relationship between two countries, but are unrelated to the trade agreement (e.g. reports related to “extending US Korea Cooperative Agreement concerning civil uses of nuclear energy”).

24 For example, the unmatched firms include Koch Industries, Mars Inc., and Bechtel Group, which are respectively the 2nd, 3rd and 5th largest private companies in the United States.

25 The variables $Sales_{f,t}$ and $Employment_{f,t}$ include sales and employees in all consolidated subsidiaries of the firm.

26 The first classification scheme is based on industry-level trade data for the U.S. and it defines industries to be...
We can use data from different segments of Compustat to infer whether a firm is an exporter. The Historical Segments provide information on export sales, although this information is missing for many firms. Additional information about exports can be found in the Customer Segment, which gives the geographic location of a firm’s top clients. To capture exporting firms, we define the dummy $Exporter_{f,t}$, which is equal to 1 if firm $f$ reports either positive export sales or at least one foreign customer among their top clients in year $t$. This definition is very conservative, in that it does not allow us to capture many exporting firms. This is because information on export sales and on the geographic location of a firm’s clients is provided on a voluntary basis, and there are thus many missing values. Moreover, firms have to report foreign customers only if they are among the top clients.

Compustat does not provide any information on firms’ imports or foreign suppliers. To identify importing firms, we have used information from Jain et al. (2013). In their study, they use customs forms to extract information on over half a million sea shipments from global suppliers to US public firms and link this information with financial data from Compustat. Based on this data, we have constructed the dummy variable $Importer_{f,t}$, which is equal to 1 if the firm is an importer (of any product, from any country) in year $t$. Unfortunately, information on firms’ imports is only available for a small subset of firms starting from 2005, so the import dummy can only be defined for 8,186 observations (out of 114,412) of our matched sample. To maximize sample size, in our empirical analysis, we will combine information on firms’ trade activities in the variable $Exporter_{f,t}$ and/or $Importer_{f,t}$, which is equal to 1 if firm $f$ is an exporter or an importer in year $t$.

Table A-2 provides descriptive statistics on firms in our matched sample, distinguishing between lobbying firms (top panel) and non-lobbying firms (bottom panel). As mentioned before, Compustat only contains information on publicly listed firms and is thus biased towards large firms. Within Compustat, lobbying firms are larger than non-lobbying firms: mean yearly sales and mean employment are respectively equal to 63.2 $US billions and 159,000 employees for lobbying firms, versus 2.7 $US billions and 8,500 employees for non-lobbying firms. The dummy variable $Exporter_{f,t}$ and/or $Importer_{f,t}$ is equal to 1 for most firms in the sample for which it can be defined. Within this sample, the propensity to trade is higher for lobbying than non-lobbying firms (99% instead of 78%).

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tradable if the absolute value of trade or the value of trade per worker is above a given threshold. The second is based on an industry’s geographical concentration. The idea is that the production of tradable goods requires specialization and scale, so industries producing tradable goods should be more concentrated geographically. They place 4-digit NAICS industries into four categories: tradable, non-tradable, construction, and other.

27Non-exporters are firms that report zero export sales or no foreign customers among their top clients (when information on export sales is missing). We cannot define the variable $Exporter_{f,t}$ for firms for which the information on export sales is missing and who do not report information about foreign clients.

28We thank Nitish Jain for providing us with the data to construct this variable.
3.4 FTA Variables

We have also constructed a series of variables capturing variation across FTAs in terms of the potential gains firms can derive from the agreements and the political support for their ratification. Descriptive statistics of these variables are reported in Table A-3 in the Appendix.

The first three variables capture the extent to which a trade agreement leads to reductions in the tariffs applied by the US and its FTA partners. The source of the tariff data is the World Integrated Trade Solution (WITS) database. We use the Effectively Applied Tariff, which is defined as the lowest available tariff, i.e. Most Favored Nation (MFN) or preferential.\(^{29}\) To avoid endogeneity concerns, these variables are constructed at \(t - 1\), the year before firm \(f\) filed the lobbying report on agreement \(a\).\(^{30}\)

\textit{Tariff applied by FTA partners on the final good}_{j,a,t-1} is the tariff faced by US producers of good \(j\) when exporting to the FTA partners, before the ratification of agreement \(a\).

\textit{Tariff applied by US on inputs}_{j,a,t-1} is the tariff faced by US producers of good \(j\) when importing their inputs from the FTA partners, before the ratification of agreement \(a\). To identify the relevant inputs, we use input-output data from the Bureau of Economic Analysis (BEA).\(^{31}\) For every pair of industries, \(i, j\), the input-output accounts provide the dollar value of \(i\) required to produce a dollar’s worth of \(j\).\(^{32}\) For every firm \(f\) producing good \(j\), we focus on its top 100 inputs \(i\) as ranked by the IO coefficients \(IO_{ij}\) (as in Alfaro et al., 2018), and collect data on the pre-agreement tariffs applied by the US on imports of these goods. The variable is constructed as a weighted average of the tariffs applied on the top 100 inputs of good \(j\), using the IO coefficients as weights (see also Alfaro et al., 2016).

The variable \textit{Tariff applied by US on the final good}_{j,a,t-1} is the tariff applied by the US on imports of good \(j\) from the FTA partners, before the ratification of agreement \(a\).

National tariff schedules are usually based on the Harmonized System (HS) classification and defined at the product (HS6) level. WITS also provides tariff data based on other classifications, including the Standard Industrial Classification (SIC). To construct the three variables above, we

\(^{29}\) Using Effectively Applied Tariffs is key when looking at the pre-agreement tariffs applied by the United States to imports from FTA partners. In several cases, producers in these countries were already able to export at preferential (i.e. GSP) rates before the agreement. For example, in 2005 the United States MFN tariff for Smoking Tobacco (HS240310) was 350%, while the Dominican Republic had a preferential tariff of 87.5%.

\(^{30}\) The year of the lobbying report is not necessarily the year in which the FTA ratification bill was voted in Congress, given that the ratification process can take more than one year.

\(^{31}\) Benchmark IO Tables from the BEA include the make table, use table, and direct and total requirements coefficients tables. We employ the Use of Commodities by Industries after Redefinitions 1992 (Producers’ Prices) tables. The BEA employs six-digit input-output industry codes, while Compustat uses the SIC industry classification. We use the concordance guide provided by the BEA. The matching is almost one to one for manufacturing sectors.

\(^{32}\) Using an example in Alfaro et al. (2016), one of the inputs necessary to make ships is fabricated metal structures. The \(IO_{ij}\) coefficient for this \(i-j\) pair is 0.0281, indicating that 2.8 cents worth of metal structures are required to produce a dollar’s worth of ships.
use the data defined at the SIC4 level, which we can directly match with the industry codes of firms in our lobbying dataset. One drawback is that SIC4 tariffs are constructed by aggregating product-level tariffs, which gives rise to measurement error and tends to hide the presence of high tariffs in some sectors. For this reason, we define the tariff variable as the maximum SIC4 tariff applied by the US/the FTA partners.33

The descriptive statistics reported in Table A-3 show that the United States tends to apply lower tariffs before the agreement than its FTA partners: the variable \( \text{Tari} f\text{f applied by FTA partners on the final good}_{j,a,t-1} \) has a mean of 34.33 and a maximum of 800.3, while the mean and maximum of the variable \( \text{Tari} f\text{f applied by US on the final good}_{j,a,t-1} \) are respectively 3.10 and 48. There are two reasons for this difference: (i) the US has generally lower MFN tariffs than its FTA partners; (ii) as mentioned above, before the entry into force of trade agreements, the US was often granting better-than-MFN (GSP) tariff preferences to FTA partners. Notice also that the variable \( \text{Tari} f\text{f applied by US on inputs}_{a,t-1} \) has a much lower mean (0.15) and maximum (3.94). This is due to the fact that this variable is constructed as a weighted average of the tariffs applied to the inputs of good \( j \), and the \( IO_{ij} \) coefficients used as weights are very low.34

A second set of FTA controls captures variation in the depth of trade agreements. As pointed out by Baldwin (2011), when firms set up production facilities abroad – or form long-term ties with foreign suppliers – they can gain from trade agreements not only through the elimination of tariffs, but also through the inclusion of provisions that reduce non-trade barriers (e.g. rules on services and competition) and help to protect their tangible and intangible assets in foreign markets (e.g. rules on investments and intellectual property rights). To measure the extent to which FTAs go beyond the elimination of tariff barriers, we use three measures of the depth of the agreements:

**Depth DESTA (index)\(_a\):** this measure, constructed by Dür et al. (2014), is an additive index that combines seven key provisions that can be included in PTAs. The first provision captures whether the agreement foresees that all tariffs (with limited exceptions) should be reduced to zero. The other six capture provisions that go beyond tariff reductions (related to services, investments, standards, public procurement, competition, and intellectual property rights).

**Depth DESTA (latent)\(_a\):** this measure, also constructed by Dür et al. (2014), relies on latent trait analysis on 48 variables capturing the extent to which the agreement goes beyond simple tariff reduction.

**Depth World Bank\(_a\):** this measure is constructed by Hofmann et al. (2018), who codify

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33When including the tariff measures in our regressions, we will control for other moments of the SIC4 tariffs. The results are robust to using only the weighted average tariffs provided by WITS. Another limitation is that tariff data is often missing, so we lose many observations when including the tariff variables in our regressions.

34The average IO coefficient in our sample is 0.038. If we construct the variable \( \text{Tari} f\text{f applied by US on inputs}_{j,a,t-1} \) as a simple (unweighted) average of input tariffs, the mean is 3.35 (which is very similar to the mean of \( \text{Tari} f\text{f applied by US on the final good}_{j,a,t-1} \)).
provisions related to 52 policy areas in trade agreements and their legal enforceability.

The third set of variables captures variation across FTAs partners, in terms of their size, export and sourcing potential. With the exception of GDP of FTA partners, these variables are constructed using information from the US Census.

GDP of FTA partners is the GDP of the partner(s) of agreement in year . The data come from the World Bank and are expressed in constant 2010 US millions of dollars.

Export potential of FTA partners measures US exports of good to the partner(s) of agreement in year (in millions of US dollars). It captures variation across FTA partners in the demand for good .

Sourcing potential of FTA partners measures US imports of the inputs necessary to make good from the partner(s) of agreement in in year (in millions of US dollars). It captures variation in the ability of FTA partners to produce the key inputs needed for the production of good . To identify the relevant inputs, we use IO tables from the BEA (see description of the variable Tariff applied by US on inputs above).

The last set of variables captures variation in expected political support for trade agreements among legislators in charge of their ratification. Party affiliation is known to be a strong predictor of US congressmen’s support for trade liberalization, with Democrats being systematically more protectionist than Republicans (e.g. Baldwin and Magee 2000; Hiscox 2004). Based on roll-call votes on all major trade liberalization bills since the early 1970s, Conconi et al. (2014) find that membership in the Democratic party decreases the probability that congressmen support trade liberalization by more than 40 percentage points. We would thus expect political support for trade agreements to be lower when a larger share of US congressmen belong to the Democratic party. Political support for the ratification of FTAs should also be lower when different parties control the executive and the legislative branches of government (e.g. Lohmann and O’Halloran, 1994; Edwards et al., 1997). This is because congressmen who are from the same party as the president are more likely to support the ratification of trade agreements. The estimates in Conconi et al. (2014) indicate that belonging to the same party as the executive increases the probability of a vote in favor of trade liberalization by around 11 percentage points.

We define the following variables:

Share of Democrats in Congress is the share of members of the legislative branch belonging to the Democratic party in year . We construct two versions of this variable. The first

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35 The US Census reports only merchandise trade statistics. Data are available for the following sectors (at the NAICS 2 level): 11 (Agriculture, Forestry, Fishing and Hunting), 21 (Mining, Quarrying, and Oil and Gas Extraction), 31-33 (Manufacturing) and 51 (Information). We have used the conversion table provided by Compustat to match firms in our lobbying dataset to NAICS2 sectors.
includes only congressmen who are members of the Democratic party, while the second also includes independent congressmen who caucus with the Democrats.

\textit{Divided Government}_t is a dummy variable equal to 1 if the legislative and executive branches are not politically aligned in year \( t \). We construct two versions of this variable. The first (second) is equal to 1 if one party controls the executive branch, while the other party controls at least one (both) of the houses of the legislative branch.

4 Stylized Facts

Using our lobbying dataset, we uncover three new facts. The first striking fact emerges when looking at the share of firms that lobby in favor/against the trade agreements:

\textbf{Fact 1.} Virtually all lobbying firms are in favor of FTAs.

Figure 1 illustrates the share of observations in our dataset corresponding to different positions on FTAs. Opposition to trade agreements is extremely rare: in 99.25\% of the cases, firms lobbied in support of the agreement; they lobbied against in only 0.75\% of the cases. Moreover, no firm systematically opposed trade agreements: only two firms lobbied against a trade agreement (with Korea), but the same firms supported other agreements (with Colombia and Panama).

![Figure 1](image)

This figure is based on all lobbying reports filed by firms, which mention the FTA ratification bills.

Figure 1 is constructed based on our main sample, which uses information from all lobbying reports that explicitly mention the bills for the ratification of the FTAs. As mentioned before, this methodology allows us to study the firms’ position on the actual trade deal that, if ratified, will be implemented. However, one might be concerned that the firms’ position during the ratification
stage — when the trade deal has already been finalized and signed by the executive — might be very different from their position in earlier stages of the negotiations — when they can still try to affect the content of the deal. To verify this, we have collected lobbying reports filed in earlier stages, using keywords instead of bill ratification numbers to trace all lobbying reports related to a FTAs. In particular, focusing on the Korea-United States FTA, the most important trade agreement negotiated during our sample period, we have collected all the reports that mention the words Korus, US-Korea FTA or US-Korea Free Trade Agreement. When using this methodology, we obtain 588 reports filed by firms related to this agreement, covering the period 2000-2011 (see Figure A-4 in the Appendix). Even in this case, virtually all lobbying firms supported the agreement: 97.8% are in favor and 2.2% are against (see Figure A-5).

Another possible concern is that using bill numbers to track lobbying on FTAs does not allow us to include trade agreements that did not reach the ratification stage. The concern here is that Fact 1 might be driven by selection effects: the overwhelming support for FTAs among lobbying firms may be due to the fact that our main sample does not contain agreements that did not reach the Congress floor precisely because they were not supported by firms. To deal with this concern, we have examined lobbying reports on the Trans-Pacific Partnership (TPP), a major FTA that never reached the ratification stage. In particular, we have collected all lobbying reports which mentioned the words Trans-Pacific Partnership or TPP filed by firms in 2016 (the year in which Obama signed the agreement). In that year, 276 firms filed 1.041 lobbying reports related to the TPP agreement. We were able to code the position of the firm in 93.8% of the cases. Our main result continues to hold: 98.4% of all firms for which we can sign the position on the FTA lobbied in favor of the agreement.

Two other facts emerge when matching our lobbying dataset with Compustat. The first concerns the role of firm size in explaining the extensive margin of lobbying on trade agreements:

**Fact 2.** Larger firms are more likely to lobby on FTAs.

Looking at firms’ employment and sales, we find that lobbying firms tend to be larger than non-lobbying firms.

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36Most lobbying reports related to KORUS were filed in 2008 (following the signature of the agreement by President Bush) and 2011 (when President Obama presented a slightly modified version of the agreement to Congress for ratification). For 28 reports filed by 7 firms, we cannot code the firm’s position on the FTA based on the information contained in the report or on official company statements. Some of these reports involve expenditures related not only to lobbying the Senate and House of Representatives, but also federal agencies such as the U.S. Trade Representative (USTR) and the Department of Commerce (DOC).
Figures 2 and 3 show that the distribution of employment and sales of lobbying firms is shifted to the right relative to the distribution of firms that do not lobby. This systematic difference between lobbying and non-lobbying firms also emerges when we estimate a probit regression model to examine how firm size affects the probability of lobbying on FTAs. The results are reported in Table I. The dependent variable is \( \text{Lobbying on FTA}_{f,j,a,t} \), a dummy equal to 1 if firm \( f \) producing good \( j \) lobbies on the ratification of agreement \( a \) in year \( t \). Notice that this is also the probability that the firm lobbies in favor of the FTA, given that no firm in our matched dataset ever lobbied against a trade agreement. We use the log of \( \text{Sales}_{f,t} \) or \( \text{Employment}_{f,t} \) to control for firm size\(^{37}\). We also include FTA fixed effects and sector fixed effects (at the SIC2 level) to

\(^{37}\)We take logs of these variables because their distribution is highly skewed. The sample includes all firm-year observations for which we have information on sales and employment. We cannot include the variables \( \text{Sales}_{f,t} \) and \( \text{Employment}_{f,t} \) in the same specification because of multicollinearity (the correlation between them is above 0.8).
account for differences across trade agreements and across industries. The positive and significant coefficients of the variables Sales\textsubscript{f,t} and Employment\textsubscript{f,t} support Fact 2: larger firms are more likely to lobby on trade agreements. The estimates indicate that a 1 percentage point increase in firm size (in terms of sales or employment) leads to a 0.004 percentage point increase in the probability that the firm lobbies in favor of FTAs. Taking into account that the predicted probability of lobbying is 0.0037, this implies a 1 percent increase in the probability of lobbying for every percentage point increase in firm size.\textsuperscript{38} The results are robust to using a linear probability model (see Table A-4 in the Empirical Appendix).

Table 1  
Probability of lobbying on FTAs, the role of firm size

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>log(Sales\textsubscript{f,t})</td>
<td>0.004***</td>
<td>0.004***</td>
</tr>
<tr>
<td></td>
<td>(0.0002)</td>
<td>(0.0003)</td>
</tr>
<tr>
<td>log(Employment\textsubscript{f,t})</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FTA FE</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Industry FE (SIC2)</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>N</td>
<td>67,716</td>
<td>67,716</td>
</tr>
<tr>
<td>pseudo R\textsuperscript{2}</td>
<td>0.504</td>
<td>0.463</td>
</tr>
<tr>
<td>Predicted probability</td>
<td>0.0037</td>
<td>0.0037</td>
</tr>
</tbody>
</table>

The table reports marginal effects of probit regressions. The dependent variable is Lobbying on FTA\textsubscript{f,j,a,t} is a dummy equal to 1 if firm f producing good j lobbies on the ratification of agreement a in year t. The variable Sales\textsubscript{f,t} is total sales by firm f in year t, while Employment\textsubscript{f,t} is the total number of employees of firm f in year t. Standard errors in parenthesis clustered at the SIC1 level. Significance levels: *: 10%; **: 5%; ***: 1%.

The third fact concerns firms’ involvement in international trade and how it affects the probability of lobbying on trade agreements:

**Fact 3.** Firms engaging in international trade are more likely to lobby on FTAs.

Table\textsuperscript{2} reports the results of probit regressions in which we examine how the probability that a firm lobbies on trade agreements depends on its participation in international trade. Column 1-3 show that firms operating in tradable sectors are more likely to lobby on FTAs. In column 1, we only include the dummy Tradable sector\textsubscript{f,t} with FTA and sector fixed effects. In column 1, we only include the dummy Tradable sector\textsubscript{f,t} with FTA and sector fixed effects. In columns 2 and 3, we respectively add the variables Sales\textsubscript{f,t} and Employment\textsubscript{f,t}. In all specifications, the marginal effect of the Tradable sector\textsubscript{f,t} dummy is positive and significant at the 1 percent level. In terms

\textsuperscript{38}This result is obtained by dividing the marginal effects of the variables Sales\textsubscript{f,t} and Employment\textsubscript{f,t} by the average predicted probability of lobbying reported at the bottom of the table.
of magnitude, our estimates imply that operating in tradable sectors increases the likelihood of lobbying on FTA by between around 153 and 278 percentage points.\footnote{These results are obtained by dividing the marginal effect of the dummy variable \textit{ Tradable sector}$_{f,t}$ in columns 1-3 of of Table 2 by the average predicted probability of lobbying on FTAs reported at the bottom of the table.}

As discussed in Section 3, we have also constructed the dummy variable \textit{Exporter and/or importer}$_{f,t}$, combining information from Compustat on firms’ export sales and/or foreign clients and on firms’ imports from Jain \textit{et al.} (2013). The drawback of using this variable in our analysis is that the sample size is drastically reduced due to missing data: when including it in columns 4-6 of Table 2, the number of observations drops from 64,112 to 12,434. The marginal effect of the variable \textit{Exporter and/or importer}$_{f,t}$ is always positive and significant, indicating that firms that are engaged in exports and/or source inputs from foreign suppliers are more likely to lobby on FTAs. In terms of magnitude, our estimates imply that participation in international trade increases the probability of lobbying on FTAs by between around 153 and 284 percentage points.\footnote{These results are obtained by dividing the marginal effect of the dummy variable \textit{Exporter and/or importer}$_{f,t}$ in columns 4-6 by the average predicted probability of lobbying on FTAs reported at the bottom of the table.} These results of Table 2 are robust to using a linear probability model (see Table A-5 in the Empirical Appendix).

### Table 2

<table>
<thead>
<tr>
<th>Probability of lobbying on FTAs, the role of trade participation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>** Tradable sector$_{f}$**</td>
</tr>
<tr>
<td>------------------------------</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Exporter and/or importer$_{f,t}$</td>
</tr>
<tr>
<td>log(Sales$_{f,t}$)</td>
</tr>
<tr>
<td>log(Employment$_{f,t}$)</td>
</tr>
<tr>
<td>FTA FE</td>
</tr>
<tr>
<td>Industry FE (SIC2)</td>
</tr>
<tr>
<td>N</td>
</tr>
<tr>
<td>pseudo R$^2$</td>
</tr>
<tr>
<td>Predicted probability</td>
</tr>
</tbody>
</table>

The table reports marginal effects of probit regressions. The dependent variable is \textit{Lobbying on FTA}$_{f,j,a,t}$ is a dummy equal to 1 if firm $f$ producing good $j$ lobbies on the ratification of agreement $a$ in year $t$. The variable \textit{ Tradable sector}$_{f}$ is a dummy equal to 1 if firm $f$ operates in a tradable sector. The dummy \textit{Exporter and/or importer}$_{f,t}$ is equal to 1 if firm $f$ exports and/or imports in year $t$. The variable \textit{ Sales}$_{f,t}$ is total sales by firm $f$ in year $t$, while \textit{Employment}$_{f,t}$ is the total number of employees of firm $f$ in year $t$. Standard errors in parenthesis clustered at the SIC1 level. Significance levels: *: 10%; **: 5%; ***: 1%.
5 Model

In the previous section we have shown that in the United States only a few large firms lobby on FTAs, and virtually all lobbying firms support the ratification of trade agreements. Moreover, the probability of lobbying on FTAs is higher for larger firms and firms engaged in international trade. To rationalize these facts, we develop a political economy model of lobbying on trade agreement by heterogeneous firms. This model can explain the above the results on the extensive margin of lobbying and delivers predictions on the intensive margin, which we take to the data in the next section.

We first describe the economic structure. Explaining lobbying by individual firms requires a model in which firms have a positive mass. We generalize Brander and Krugman (1983) two-country model of oligopolistic competition, by introducing firm heterogeneity and selection into exporting. In each sector, we allow firms to differ in productivity both within and across countries. We show that the entry into force of a FTA creates winners and losers, with the most productive firms in gaining more (or losing less) from the agreement.

We then turn to the political structure of the model. This has two main features. First, firms pay lobbying expenditures before the policy outcome is realized, i.e. before the ratification of a trade agreement. Second, politicians deciding on the ratification of the agreement may be biased in favor or against it and firms are uncertain about this political bias.

5.1 Economic Structure

5.1.1 Setup

We describe a model of trade between a Home and Foreign country. We will use a * to denote variables related to Foreign. In each country, the economy consists of J + 1 sectors produced with labor alone. Good 0 is a numeraire, produced under constant returns to scale technology, sold under perfect competition, and freely traded. Goods 1,...,J are produced by heterogenous oligopolistic firms.

Each economy is populated by a unitary mass of consumers, who shares the same quasi-linear and additively separable preferences:

$$U(q_0, Q_1,...,J) = q_0 + \sum_{j=1}^{M} u(Q_j),$$

where $q_0$ represents the consumption of the numeraire good, and $Q_j$ represent the consumption of

---

41 As discussed in Section A.2.2 of the Theoretical Appendix, standard models of monopolistic competition à la Melitz (2003) or oligopolistic competition with a continuum of industries cannot explain lobbying by individual firms. This is because, when firms have no mass, they are inconsequential, i.e. their lobbying expenditures cannot affect policy outcomes.
the other goods.

Under the above assumptions, there is no economic interdependence between sectors. As discussed in Section 5.2, however, our model will feature political interdependence between firms operating in different sectors.

In each sector $j$, there is an arbitrary large number of potential entrants in both Home and Foreign, indexed by $i$. To model heterogeneity in productivity among $j$ producers within countries, we assume that the most productive firm (the “technological leader”) in Home (resp. Foreign) has marginal cost $c_{j1}$ (resp. $c^*_j$); there is a constant gap $\delta_j > 0$ in the marginal cost of firm $i_{th}$ and $i_{th} + 1$, so that $c_{ji} = c_{1j} + (i - 1) \delta$ (resp. $c^*_j = c^*_1 + (i - 1) \delta$).

We also allow for heterogeneity in productivity within sectors across countries. This is captured by $\lambda_j = c_{j1} - c^*_j$, the marginal cost gap between the leader firms in Home and Foreign. Thus Home (resp. Foreign) firms have Ricardian comparative advantage in good $j$ when $\lambda_j > 0$ (resp. $\lambda_j < 0$).

We will assume that the two countries are symmetric in their technological differences, i.e. for each sector $j$ in which Home has a comparative advantage, there is a “mirror image” sector in which Foreign has comparative advantage.

Following Brander and Krugman (1983), firms compete à la Cournot in segmented markets, i.e. in the presence of constant returns to scale, they set their quantities to maximize their profits independently in each market.

Entry is determined by a zero profit condition, i.e. firms that are not active in equilibrium would make negative profits by entering. For simplicity, we will ignore the integer constraint and consider that the last active firm makes exactly zero profits so that the equilibrium market price coincides with its marginal cost of production. We define the endogenous cutoffs $\bar{c}_j$ and $\bar{c}^*_j$, which identify the least productive active firms on either market, and denote with $N_j$ and $N^*_j$ the endogenous number of active firms that make strictly positive profits.

When selling a good on the foreign market, Home (resp. Foreign) producers of good $j$ face a specific tariff $\tau^*_j$ (resp. $\tau_j$). Consequently, for a Home firm with technology $c_{ji}$, producing for the foreign market implies an augmented marginal cost of $c_{ji} + \tau^*_j$.

It is worth noting that, in this setting, any equilibrium will feature perfect sorting of firms along their marginal costs. As shown below, even in the absence of fixed costs of production and exporting, only the most productive firms will operate domestically and serve the foreign market.

Closed Economy

To illustrate the model, consider first a sector $j$ in which tariffs $\tau_j$ and $\tau^*_j$ are prohibitively high, even for the most productive firms (i.e. $c_{j1} + \tau^*_j > \bar{c}^*_j$ and $c^*_j + \tau_j > \bar{c}_j$).

\[42\] Thus the distribution of productivity is deterministic, which will allow to make predictions at the firm level. If we assumed instead a finite number of random draws, we would only be able to make predictions on average.

\[43\] This assumption guarantees that the payoff distributions of firms that select into lobbying are identical across countries.
Under Cournot competition and linear demand, total output in Home in sector \( j \) is equal to

\[
Q_j(N_j) = \frac{N_j \alpha - \sum_{i=1}^{N_j} c_{ji}}{N_j + 1}.
\]

The cutoff \( \bar{c}_j \) is determined by \( \bar{c}_j = c_{j1} + N_j \delta \), where \( N_j \) is the solution to

\[
\frac{\alpha - c_{j1}}{\delta} = \left( \frac{N_j + 3}{2} \right) N_j.
\]

Figure 4 illustrates the distribution of marginal costs of Home firms operating in sector \( j \), from the most productive (with marginal cost \( c_{j1} \)) to the least productive one (with marginal cost \( \bar{c}_j \)).

Figure 4
Marginal Costs of Home Firms in Sector \( j \) (Closed Economy)

Equilibrium profits of each firm \( i \) are given by

\[
\Pi_{ji} = \frac{1}{2} (\bar{c}_j - c_{ji})^2.
\]

Open Economy

Consider next the case of non-prohibitive tariffs. In this case, there will be selection into exporting: a Home firm \( i \) will export only if it can be competitive in the Foreign market, i.e. iff \( c_{ji} \leq \bar{c}_j^X \equiv \bar{c}_j - \tau_j^X \). Similarly, a Foreign firm \( i \) will export iff \( c_{ji}^* \leq \bar{c}_j^X \equiv \bar{c}_j - \tau_j^X \).

Figure 5 illustrates selection into trade in the absence of cross-county differences in technology, i.e. when the underlying cost distributions of Home and Foreign are perfectly overlapping (\( \lambda_j = 0 \)).
Figure 5
Selection into Exporting by the Most Productive Home Firms ($\lambda_j = 0$)

To capture the initial degree of tariff protection and determine the equilibrium cutoffs and the profits of firms operating in each market, we define $\kappa_j^*$ and $\kappa^*_j$ as the “distance” between the Home and Foreign leaders due to the presence of tariffs and technological differences. This formulation allows us to track the position of Home and Foreign firms when they operate in the same market.

As an example, consider Home producers of good $j$ operating in Foreign and assume that there are no technological differences between them, i.e. $\lambda_j = 0$. A tariff equal to $\tau_j^* = 2\delta_j$ gives a competitive edge to Foreign firms, as it implies that the Home leader makes the same profits as the third most productive Foreign firm. Figure 6 illustrates this case, i.e. when $\kappa_j^* = 2$.

Figure 6
Competition in the Foreign Market

More generally, if the tariff is such that $\tau_j^* = \lambda_j + \kappa_j^*\delta$, the Home leader will make the same profits as the $\kappa^* + 1$ most productive Foreign firm. For a given $\tau_j^* > 0$, having a cost advantage $\lambda_j$ decreases the distance $\kappa^*$ of Home firms from the Foreign leader; for a large enough $\lambda_j$, $\kappa^*$ can even be negative, in which case the most productive Home firm operating abroad will be more profitable.
than the Foreign leader.

Following the above definition, note that $\kappa^*_j$ represents the difference between the equilibrium number of Foreign and Home that are active in the Foreign market, i.e. $N^*_j - N^*_X = \kappa^*_j$. Graphically, it captures the extent to which the cost distributions do not overlap (see Figure 6). Similarly, $\kappa_j$ is the difference between the equilibrium number of Home and Foreign firms that are active in the Home market, i.e. $N_j - N^*_X = \kappa_j$. In other words, $\kappa_j$ and $\kappa^*_j$ are sufficient statistics for the degree of import penetration in the two markets, resulting from the combination of tariffs and technology.

We can now solve for the production cutoffs in the two markets. Consider first the Foreign market with an import tariff $\tau^* = \lambda + \kappa^* \delta$ and assumes that the most efficient firm in Foreign is the most profitable one, i.e. $\kappa^*_j \geq 1$. The cutoff $\bar{c}^*_j$ is then determined by $\bar{c}^*_j = c^*_j + N^*_j \delta$, where $N^*_j$ is the solution to

$$\frac{\alpha - c^*_j}{\delta_j} = \left( N^*_j + 2 - \kappa^*_j \right) N^*_j + \left( \frac{\kappa^*_j + 1}{2} \right) \kappa^*_j. \quad (3)$$

Likewise, in the Home market, when import tariff is $\tau_j = \kappa_j \delta_j - \lambda_j > 0$, the cutoff $\bar{c}_j$ is determined by $\bar{c}_j = c_j + N_j \delta_j$, where $N_j$ is the solution to

$$\frac{\alpha - c_j}{\delta_j} = \left( N_j + 2 - \kappa_j \right) N_j + \left( \frac{\kappa_j + 1}{2} \right) \kappa_j. \quad (4)$$

Selection into Exporting under Two-Way Trade

When $\lambda_j = 0$ and $\tau_j = \tau^*_j$, cost distributions perfectly overlap and we are back to an oligopolistic model of intra-industry trade à la Brander-Krugman, albeit with heterogeneous firms. By symmetry, we have that $N^*_j = N_j$. We can then immediately see that $\kappa_j = \kappa^*_j \geq 1$ guarantees that there is selection into exporting.

Furthermore, inspecting (3) and (4) shows that a decrease in tariffs leads to a decrease in the domestic cutoffs $\bar{c}_j = \bar{c}^*_j$, inducing the exit of the least productive domestic firms. By contrast, the export cutoffs $\bar{c}^*_X = \bar{c}^*_X$ unambiguously decrease, implying that a larger subset of domestic firms find it profitable to export (see Figure 7).
The profits of a Home firm $i$ are given by

$$\Pi_{ji} = \frac{1}{2}(\bar{c}_j - c_{ji})^2 + \frac{1}{2}(\bar{c}_j^* - c_{ji} - \tau_j)^2 1_{c_{ji} + \tau_j \leq \bar{c}_j^*}$$

and symmetrically for a Foreign firm $i$:

$$\Pi_{ji}^* = \frac{1}{2}(\bar{c}_j^* - c_{ji}^*)^2 + \frac{1}{2}(\bar{c}_j - c_{ji}^* - \tau_j)^2 1_{c_{ji}^* + \tau_j \leq \bar{c}_j}$$

It follows that a reduction in tariffs decreases domestic profits of both exporting and non-exporting firms, but increases foreign profits of exporting firms. Firms that only serve the domestic market will thus unambiguously lose from the entry into force of the agreement. By contrast, the overall profits of exporting firms might decrease or increase when tariffs are reduced, consistent with the seminal contribution of Brander and Krugman (1983).

Selection into Exporting under One-Way Trade

Consider next the other extreme case in which the cost distributions are not overlapping in the closed economy, so that Home firms in sector $j$ are equipped with a much better technology than firms in Foreign. This will be the case when $\lambda_j$ is large enough that

$$\bar{c}_j < c_{j1}^*$$

or equivalently

$$\lambda_j > \bar{\lambda}_j \equiv N_j \delta,$$

where $N_j$ is the solution to (2).
The profits of a firm $i$ in Home are given by

$$\Pi_{ji} = \frac{1}{2}(\bar{c}_j - c_{ji})^2 + \frac{1}{2}(\bar{c}_j^* - c_{ji} - \tau_j^*)^21_{c_{ji} + \tau_j^* \leq \bar{c}_j^*},$$

while Foreign firms earn

$$\Pi^*_{ji} = \frac{1}{2}(\bar{c}_j^* - c_{ji}^*)^2.$$

In this case, a reduction in $\kappa_j$ (and thus in $\tau_j$) would have no impact on trade, as the technological advantage of Home firms is enough to protect them from foreign competition. Instead, a decrease in $\kappa_j^*$ (and thus in $\tau_j^*$) improves Home firms’ access to the foreign market. In turn, this increases competition for Foreign domestic firms, leading to the exit of the least productive ones and lowering the profits of surviving firms.

5.1.2 The impact of a FTA

We can finally look at the effects of a proposed FTA between Home and Foreign, which leads to the elimination of tariffs in all sectors.\footnote{For tractability purposes and without loss of generality, we consider that firms keep maximizing their profits independently on both markets even when $\tau = \tau^* = 0$, i.e. when tariffs are entirely removed.}

It is worth noting that under linear demand and specific tariffs, firms’ gains or losses in each market are supermodular in marginal costs and tariffs. In the case of Home, profits of non-exporting firms are such that

$$d^2\Pi_{ji} = -d\tau_j^*(\bar{c}_j - c_{ji}) > 0 \text{ for } (i, j) \text{ such that } c_{ji} + \tau_j^* > c_j^*.$$

In other words, the largest losses in the domestic market are incurred by the most productive firms. Likewise for exporting firms, the most productive are those who gain the most profits on the foreign market thanks to the FTA.

Non-exporting Home firms always lose from the FTA:

$$\Delta\Pi_{ji} = \frac{1}{2}(\bar{c}_j^{FTA} - c_{ji})^21_{c_{ji} > c_j} - \frac{1}{2}(\bar{c}_j - c_{ji})^2 < 0.$$

Exporting firms may gain or lose from the agreement, depending on whether the gains in the foreign market outweigh the losses in the domestic market. Their profit change is given by:

$$\Delta\Pi_{ji} = \frac{1}{2}(\bar{c}_j - c_{ji})^2 + \frac{1}{2}(\bar{c}_j^* - c_{ji} - \tau_j^*)^21_{c_{ji} + \tau_j^* \leq \bar{c}_j^*}$$

$$-\frac{1}{2}(\bar{c}_j^{FTA} - c_{ji})^2 + \frac{1}{2}(\bar{c}_j^{FTA*} - c_{ji})^21_{c_{ji} \leq \bar{c}_j^{FTA*}}.$$
profits of exporting firms will generally be U-shaped, with firms gaining from a FTA only if the initial tariff is lower than an initial threshold. The most productive firm (i.e. with marginal cost $c_{j1}$) will experience the biggest gains (or the smallest losses).

With large enough technological asymmetries across countries ($\lambda_j > \bar{\lambda}_j$), there will be one-way trade. In this case, exporting firms will necessarily benefit from a FTA, which will improve their access to the foreign market, without increasing competition in the domestic market. The most productive firm will achieve the maximum gains from the FTA equal to

$$\Delta \Pi_{1j} = \frac{1}{2}(c_{j}^{*\text{FTA}} - c_{j1})^2 - \frac{1}{2}(\bar{c}_j^* - c_{j1} - \tau_j^*)^2 > 0.$$ 

5.2 Political Structure

In the previous section, we have examined the distributional effects of a proposed FTA between Home and Foreign. The entry into force of the agreement creates winners and losers among firms operating in the same sector, as well as across firms in different sectors.

We next describe the political structure of the model, in which firms choose whether to lobby and how much to spend in favor or against a proposed FTA. Each firm $f$ may lobby with a contribution $l_f$ to affect the ratification of a proposed FTA. Lobbying requires paying a fixed cost $F_L$.

We denote with $\Omega_P$ the set of Home firms that are pro agreement (i.e. for which $\Delta \Pi_f > 0$) and with $\Omega_A$ the set of Home firms that are against it (i.e. for which $\Delta \Pi_f < 0$). Notice that, while there are no inter-sectoral linkages in the economic structure of the model, the political structure features an interdependence between firms operating in different sectors, which share the same policy preferences (pro or against the agreement).

There can be a bias ($B$) among politicians deciding on FTA ratification. They may be in favor of the trade agreement, in which case $B > 0$. Or they may oppose ratification, possibly because of distributive concerns or re-election motives, in which case $B < 0$. Crucially, we model $B$ as a random variable, reflecting uncertainty about the direction of the political bias. We do not impose any constraints on the random variable $B$, except that its support is not empty for both negative and positive real numbers. In that sense, we simply rule out that the direction of the bias of the government is deterministic.

The probability that the Home country ratifies the FTA is given by the following contest success

\[\text{45} \text{In the previous section, we have used subscript } i \text{ to denote firms operating in a sector } j \text{ of the economy. In this section, we use subscript } f \text{ to denote lobbying firms (independently of the sector in which they operate).}
\]

\[\text{46} \text{There can be different reasons for an anti-FTA bias. Re-election motives can drive US congressmen to vote against the ratification of trade agreements (Conconi et al., 2014). Some politicians may also oppose trade agreements because of pressure by labor unions (who are systematically against them, see Figure A-3) or because they are concerned about the survival of some firms in their constituencies.}
\]

\[\text{47} \text{From the perspective of the US firms in our lobbying dataset, this assumption implies that they are uncertain about whether there is a majority of House and Senate members in favor of the ratification of a trade agreement.}
\]
function:

\[ P(l, B) \equiv \frac{\sum_{f \in \Omega_P} l_f + B^+}{\sum_{f \in \Omega_P} l_f + \sum_{f \in \Omega_A} l_f + |B|}, \]

where \( B^+ = \max\{B, 0\} \).

A few remarks are in order. First, the fact that the policy outcome is probabilistic reflects some randomness in the effectiveness of lobbying activities, as in standard contest success functions (see Jia et al., 2013 and Section A 2.3 in the Theory Appendix for microfoundations).

Second, we add to the standard framework the possibility that the government can be biased, and there is uncertainty about the direction of this bias. Introducing the political bias is equivalent to adding a random contribution from a player who can be in favor or against the agreement. Compared to a situation without any bias, this unambiguously raises (decreases) the probability that a FTA is ratified in the absence of pro-FTA (anti-FTA) contributions.

Third, our setting features free riding: because lobbying expenditures are substitutable in the probability of ratification, the absence of coordination among firms with the same trade policy preference leads to under-lobbying (see discussion at the end of this subsection).

We assume that the governments’ biases \( B \) and \( B^* \) are independent across countries. The overall probability of ratification can then be written as the product of the countries’ contest success functions \( P \) and \( P^* \):

\[ \mu(l, l^*; B; B^*) \equiv P(l, B) \cdot P^*(l^*, B^*) = \frac{\sum_{f \in \Omega_P} l_f + B^+}{\sum_{f \in \Omega_P} l_f + \sum_{f \in \Omega_A} l_f + |B|} \cdot \frac{\sum_{f^* \in \Omega^*_P} l^*_{f^*} + B^{*+}}{\sum_{f^* \in \Omega^*_P} l^*_{f^*} + \sum_{f^* \in \Omega^*_A} l^*_{f^*} + |B^*|}. \]

Each firm chooses whether to pay the fixed lobbying cost \( F_L \) and, if politically organized, its lobbying expenditure \( l_f \) to maximize its expected payoff:

\[ \mathbb{E}[P(l, B)] \cdot \mathbb{E}[P^*(l^*, B^*)] \cdot \Delta \Pi_f - \frac{l_f^2}{2} - 1_{l_f > 0} \cdot F_L, \]

where \( \Delta \Pi_f > 0 \forall f \in \Omega_P \) and \( \Delta \Pi_f \leq 0 \forall f \in \Omega_A \).

We assume here that the marginal cost of lobbying is increasing as in Esteban and Ray (2001) and Bouton et al. (2018). We choose quadratic costs for the sake of simplicity, though it is readily verified that the following results go through for any convex power function of lobbying expenditures.

\footnote{In our benchmark model, firms can only lobby to affect the ratification decision in their own country. The key results of our analysis continue to hold if we allow firms to affect the probability of ratification in Home and Foreign. In this case, firms choose to lobby in both countries and their expenditures at Home are higher than in our benchmark model. This is because optimal lobbying expenditure by firms in one country depend positively on the probability that the FTA is ratified in the other country (see equation \ref{eq:optimal_l}).}
5.3 Firm Lobbying on FTAs: Extensive Margin

The main finding of our empirical analysis is that all firms lobbying on FTAs are in favor of their ratification (Fact 1). In terms of our model, this means that only firms in the set $\Omega_P$ lobby, while firms in $\Omega_A$ are not politically organized. In what follows, we show that this can happen if the more productive firms gain from the trade agreement and select into lobbying, while less productive firms, which may lose or gain from the agreement, cannot cover the fixed lobbying cost $F_L$.

Let us define with $\Delta\Pi_A$ the maximum loss experienced by a firm if the agreement enters into force. In an import-competitive industry where Home firms crowd out Foreign firms, this corresponds to the pre-FTA profits made by the Foreign leader.

In what follows, we will assume that the following condition is satisfied:

**Condition 1.** $F_L > |\Delta\Pi_A|$.

This is a sufficient condition guaranteeing that no anti-FTA firm will have incentive to lobby on the trade agreement. Typically, if an import-competitive industry is not very competitive pre-FTA, its profits will be low and the above condition will be easily met.

When only pro-FTA firms lobby, we can rewrite the contest success function (equation (5)) in each country as a function of the overall contributions of firms in favor of the agreement $L \equiv \sum_{\Omega_P} l_f$, i.e. $P(1, B) \equiv P(\mathcal{L}, B) \equiv \frac{L^+ B^+}{L^+ + |B^+|}$. A pro-FTA firm maximizes

$$\mathbb{E}[P(\mathcal{L}, B)] \cdot \mathbb{E}[P^*(\mathcal{L}^*, B^*)] \cdot \Delta\Pi_f - \frac{1}{2} l_f^2 - 1_{l_f > 0} \cdot F_L.$$  (8)

Uncertainty in the direction of the government bias rules out trivial Nash equilibria where firms in both countries would choose not to lobby. Intuitively, from the perspective of a firm in the Home country, even if all firms in Foreign lobby against the ratification of the agreement, the expectation about the probability of the Foreign country ratifying the agreement $\mathbb{E}[P^*(\mathcal{L}^*, B^*)]$ is strictly positive, because of the uncertainty in the foreign government bias. Therefore, without loss of generality, we further assume that $\mathbb{E}[P^*(\mathcal{L}^*, B^*)] > 0$, i.e. firms in the Home country conjecture a non-zero expected probability of ratification by the Foreign country.

Given two random variables $X$ and $Y$, we denote the expectation of $X$ given $Y$ taking positive or negative values as follows: $\mathbb{E}_{Y>0}[X] \equiv \mathbb{E}[X|Y>0]$ and $\mathbb{E}_{Y<0}[X] \equiv \mathbb{E}[X|Y<0]$. The expected probability of ratification by the Home country can then be written as

$$\mathbb{E}[P(\mathcal{L}, B)] = \mathbb{P}(B < 0) \cdot \mathbb{E}_{B<0} \left[ \frac{\mathcal{L}}{\mathcal{L} - B} \right] + \mathbb{P}(B \geq 0).$$  (9)

The first term is equal to the probability that the government is biased against ratification times the probability that the FTA is ratified in that case. The second term represents the probability

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More trivially, the set $\Omega_A$ could be empty, i.e. if all firms gain from the FTA (see Section A 2.1 in the Theoretical Appendix).
that the government is in favor of the FTA multiplied by \( \mathbb{E}_{B>0} \left[ \frac{E}{E-B} \right] = 1 \), the probability of ratification when the government is in favor of the FTA.

The minimum probability that the agreement enters into force (i.e. in the absence of any lobbying) is \( \mu \equiv \mathbb{P}(B > 0) \cdot \mathbb{P}(B^* > 0) \). From the point of view of a pro-FTA firm \( f \), the minimum expected gain is then \( \mu \cdot \Delta \Pi_f \). Given that the marginal cost of lobbying is 0 in 0, firm \( f \) will choose to lobby in favor of the FTA if \( F_L < \mu \cdot \Delta \Pi_f \). Denoting with \( \Delta \Pi_P \) the largest gain experienced by a firm if the agreement is implemented, a sufficient condition for selection into lobbying by pro-FTA firms is then:

**Condition 2.** \( F_L < \mu \cdot \Delta \Pi_P \).

This condition guarantees that at least one exporting firm gets politically organized and lobbies in favor of the trade agreement. In the light of our model, this condition will be easily met in sectors in which a country has a technological advantage.

We denote with \( \Omega_L \) the endogenous set of lobbying firms. Condition \( 1 \) guarantees that \( \Omega_L \) does not include anti-FTA firms, while Condition \( 2 \) guarantees that this set includes at least one pro-FTA firm.

We can thus state the following:

**Result 1.** If conditions \( 1 \) and \( 2 \) hold, only pro-FTA firms will lobby \( (\Omega_P \subset \Omega_L) \).

Our model features free riding on the extensive margin. Indeed, firms in \( \Omega_P \) that cannot cover the fixed cost \( F_L \) will benefit from the lobbying effort of pro-FTA firms that select into \( \Omega_L \), whose expenditures raise the probability that the trade agreement is ratified, generating a positive externality.

To characterize which pro-FTA firms belong to the endogenous set \( \Omega_L \), we start by observing that, among lobbying firms, those that gain more from the FTA are also those that gain more from lobbying.\(^{50}\) We can also prove that the partition of pro-FTA firms into lobbying will feature perfect sorting. In other words, it cannot be that, at equilibrium, a non-lobbying firm with a larger payoff from the FTA coexists with a lobbying firm that expects smaller gains from the FTA. To see this, it is sufficient to notice that, if this were the case, the non-lobbying firm would get a strictly larger return by spending exactly the same amount than the lobbying firm, making it profitable to cover the fixed cost. Any admissible Nash equilibrium must therefore feature a perfect sorting of pro-FTA firms into lobbying. It can be shown that, in the absence of firm heterogeneity \( (\Delta \Pi_f \equiv \Delta \Pi \ \forall f \in \Omega_P) \), the only admissible partition would be one in which all pro-FTA firms would lobby, i.e. \( \Omega_L \equiv \Omega_P \). Firm heterogeneity generates selection among pro-FTA firms, whereby \( \Omega_P \subset \Omega_L \). Without specifying the functional form of the bias and the distribution of firms’ payoffs from the FTA, we cannot rule out multiple admissible set in the equilibrium defined

\(^{50}\)The proof of this complementarity is in Section A 2.5 of the Theoretical Appendix.
by $\Omega_L = \{ f \in \Omega_P | \mathbb{E}[P(L, B)] \cdot \mathbb{E}[P^*(L^*, B^*)] \cdot \Delta \Pi_f - \frac{1}{2} l_f^2 \geq F_L \}$, where $\hat{L}$ is given by (12). However, they will all be consistent with the fact that firms which gain the most from the FTA are those who select into lobbying.

Under the assumption of symmetric countries, the existence of a symmetric equilibrium is proven by setting $\mathbb{E}[P^*] \equiv \mathbb{E}[P]$ in (12). Total contributions are then defined implicitly by the following equation, which admits a unique and strictly positive solution (see Section A 2.4 of the Theory Appendix):

$$\mathbb{P}(B < 0) \mathbb{E}_{B<0} \left[ \frac{-B}{(\hat{L} - B)^2} \right] \left( \mathbb{P}(B < 0) \cdot \mathbb{E}_{B<0} \left[ \frac{\hat{L}}{\hat{L} - B} \right] + \mathbb{P}(B \geq 0) \right) \left( \sum_{\Omega_P} \Delta \Pi_f \right) = \hat{L}.$$  (10)

Summarizing our results on the extensive margin, our model provides a simple rationale for our key empirical finding that lobbying firms always support FTAs (Fact 1). In our model, only the most productive oligopolistic firms select into exporting. A FTA increases competition in the domestic market, but improves access to the foreign market. As a result, firms that only serve the domestic market are always hurt by the agreement, while exporting firms may gain.

In this setting, we have derived conditions under which the more productive firms gain from the FTA and select into lobbying, while less productive firms lose from the agreement but cannot cover the fixed lobbying cost and remain unorganized, in line with Fact 1.

Our model is also consistent with the other empirical findings documented in Section 4: lobbying on trade agreements is a rare event – even among publicly traded companies – and lobbying firms are larger and more likely to be engaged in trade than non-lobbying firms.

### 5.4 Firm Lobbying on FTAs: Intensive Margin

The optimal lobbying expenditure $\hat{l}_f$ of a pro-FTA firm is given by differentiating (8), which implies

$$\mathbb{E}[P^*] \cdot \mathbb{P}(B < 0) \cdot \mathbb{E}_{B<0} \left[ \frac{-B}{(\hat{L} - B)^2} \right] = \hat{l}_f \Delta \Pi_f.$$  (11)

Notice that, if firms knew with certainty that the government is biased in favor of the FTA (i.e. if $B$ could only take positive values), then no firm would find it profitable to lobby in favor. However, as long as there is some uncertainty about the direction of the bias ($B$ can be positive or negative with a strictly positive probability), pro-FTA firms will find it profitable to lobby in favor of the agreement, even if $\mathbb{E}[B] > 0$.

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51 In the absence of uncertainty, an equilibrium in which pro-FTA firms lobby in favor of the agreement could only arise if the government was biased against it (i.e. if $B$ could only take negative values).
Summing (11) over all contributors, we get

\[ E \left[ P^* \right] \cdot P(B < 0) \cdot \left( \sum_{f \in \Omega_L} \Delta \Pi_f \right) = \frac{\hat{\mathcal{L}}}{E_{B<0} \left[ \frac{-B}{(\mathcal{L}-B)^2} \right]}, \]  

which shows that total contributions in Home \( \hat{\mathcal{L}} \) increase with \( E[P^*] \). Combining (11) and (12), we get that the share of firm’s lobbying expenditure does not depend on \( E[P^*] \):

\[ \frac{i_f}{\mathcal{L}} = \frac{\Delta \Pi_f}{\sum_{f \in \Omega_L} \Delta \Pi_f}, \]

so the contribution of each firm has to be increasing in \( E[P^*] \). We can thus state the following:

**Result 2.** Lobbying expenditure by pro-FTA firms in Home depend positively on the probability that the FTA is ratified in Foreign.

This interdependence between lobbying efforts across countries has already been pointed out by Cole et al. (2018): given that the implementation of a trade agreement require ratification by both countries, the “parallel” contests in each country are intrinsically linked.

Our model delivers two additional results about the intensive margin of lobbying. The first is related to the change in firms’ profits:

**Result 3.** Lobbying expenditures by pro-FTA firms are proportional to their profit gains from the agreement.

Specifically, comparing two firms \( f \) and \( f' \), relative lobbying expenditures are proportional to relative payoff gains from the FTA:

\[ \frac{i_f}{i_{f'}} = \frac{\Delta \Pi_f}{\Delta \Pi_{f'}} \quad \forall (f, f') \in \Omega_L^2. \]  

As mentioned in the previous section, the model features free riding on the extensive margin. There is also free riding on the intensive margin, since each firm in \( \Omega_L \) benefits from the efforts of other firms that lobby in favor of the ratification of the agreement. It can be shown that, under coordination, the endogenous set of lobbying firms would be larger (\( \Omega_{L'} > \Omega_L \)). Moreover, total expenditures by lobbying firms would be larger under coordination. In this case, pro-FTA lobbying firms would choose their expenditures as if the gains from the FTA were \( |\Omega_{L'}| \) times larger, i.e. \( |\Omega_{L'}| \sum_{\Omega_{L'}} \Delta \Pi_f \).

The last result concerns the role of the political bias:

**Result 4.** Lobbying expenditures by pro-FTA firms increase with the probability that politicians are against ratifying the agreement.
To see this, we first need to define a change in the probability that politicians are against the agreement. Generally, a change in the distribution of the political bias will impact the probability of ratification in two ways. From (9), it will have an impact on the probability that a government is in favor or against the FTA, but also on the probability of ratification conditional upon the direction of the bias. Crucially, these conditional probabilities are endogenous and depend on the overall amount of contributions.

To isolate the impact of the direction of the political bias, we consider a shift in the distribution of $B$ that leaves unchanged the conditional probability distributions of the bias conditional on it being negative. In particular, such a change in the distribution will leave unchanged the expected probability that the FTA is ratified (respectively not ratified) conditional upon the bias being negative (respectively positive). In equation (9), it means that, for a given $L$, the expected probability of ratification is then impacted only through $\mathbb{P}(B < 0)$ (or equivalently $\mathbb{P}(B \geq 0)$). These changes in the distribution of $B$ preserve the conditional expectations of the probability of ratifications, allowing us to examine how the direction of the bias alone impacts firm-level lobbying (see Section A 2.6 in the Theoretical Appendix for details).

Under this distributional shift, an increase in the probability that the government is in favor of the agreement is equivalent to a decrease in the probability that the foreign government ratifies it. This can be seen by inspecting (11) again. When the probability of being in favor of the FTA increases, i.e. $\mathbb{P}(B < 0)$ decreases, the expected marginal impact of a contribution remains unchanged so it is as if lobbying firms were facing a decrease in $\mathbb{E}[P^\ast]$. This implies that an increase in the probability that the government is in favor of the agreement leads to a decrease in the equilibrium contributions of all firms.

Intuitively, when legislators are more likely to be in favor of the agreement, firms tend to free ride on their political bias, decreasing lobbying expenditures in favor of ratification. In the limit case in which the political bias is deterministic and positive, pro-FTA firms would not lobby at all. When the direction of the bias becomes uncertain and the probability that the government is in favor decreases, the expected payoff of a firm becomes more dependent on the probability that the FTA is ratified under a negative bias, leading each firm to increase its lobbying expenditure.

5.5 Testable Predictions about Firms’ Lobbying Expenditures on FTAs

The analysis carried out in the previous section delivers testable predictions on the intensive margin of lobbying on FTAs, which we will bring to the data in the next section.

According to Result 2, lobbying expenditures in support of a FTA should be proportional to their profit gains in case of ratification of the agreement. The extent of the profit gains increases in their productivity (and the size) of the lobbying firm. This leads to our first prediction:

P.1: Larger firms should spend more lobbying in support of FTAs.
To assess the validity of this prediction, in the next section we will exploit cross-firm variation in lobbying expenditures on trade agreements.

A second implication of Result 2 is that individual firms should spend more supporting trade agreements that generate larger potential benefits:

P.2: Individual firms should spend more in support of FTAs that generate larger profit gains.

To bring this prediction to the data, we will exploit within-firm variation in lobbying expenditures across trade agreements, depending on the level of pre-agreement tariffs on their final goods and intermediate inputs, the extent to which the agreement removes non-tariff barriers, as well as the size of the FTA partners in terms of export and sourcing potential.

Result 4 suggests that lobbying expenditures by pro-FTA firms should also depend on the expected political support for the agreements among legislators deciding on the ratification. Intuitively, when politicians are more likely to be in favor of the agreement, firms tend to free ride on the political bias, thus decreasing their lobbying expenditures. This leads to our last testable prediction:

P.3: Individual firms should spend more lobbying in support of FTAs when US legislators are less likely to be in favor of ratification.

To assess the validity of this prediction, we will exploit variation in political support for the ratification of trade agreements across US Congresses.

6 Determinants of Firms’ Lobbying Expenditures on FTA

In this section, we assess the validity of our model’s predictions about the determinants of firms’ lobbying expenditures on FTAs.

A first look at the data already shows a correlation between the size of lobbying firms and how much they spend in support of FTAs, in line with prediction P.1 (see Figures 8 and 9).
Figure 8

The figure plots the log of $\text{Lobbying expenditure}_{f,j,a,t}$ against the log of $\text{Employment}_{f,t}$.

Figure 9

The figure plots the log of $\text{Lobbying expenditure}_{f,j,a,t}$ against the log of $\text{Sales}_{f,t}$.

In Table 3 we more systematically examine the relationship between firm size and lobbying expenditures, focusing on all firms that lobbied on at least one FTA. We exploit variation in size across firms, regressing the log of $\text{Lobbying expenditure}_{f,k,a,t}$ against the log of $\text{Sales}_{f,t}$ or $\text{Employment}_{f,t}$. In columns 1-2, we include only FTA fixed effects, to account for differences across trade agreements (e.g. distance of the FTA partners). In the remaining columns, we include industry fixed effects at the SIC1 level (columns 3-4) and SIC2 level (columns 5-6). Standard errors are clustered at the SIC1 level, but the results are robust to using broader or narrower clusters.

\footnote{We use the log of $(1 + \text{Lobbying expenditure}_{f,j,a,t})$ to be able to include zero expenditures on some agreements.}
The results confirm that larger firms spend more in support of FTAs, in line with prediction P.1 of our model. In terms of magnitude, the coefficients reported in column 5 and 6 of Table 3 indicate that a 1 percent increase in \(Sales_{f,t}\) \(Employment_{f,t}\) leads to a 0.3 (0.4) percent increase in firms’ lobbying expenditures on FTAs. Put differently, as we move from the 10th percentile to the 90th percentile of \(Sales_{f,t}\) \(Employment_{f,t}\), \(Lobbying expenditure_{f,j,a,t}\) increases by around 0.909 (1.215) standard deviations.

Table 3
Lobbying expenditures on FTAs, variation in firm size

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(\log(Sales_{f,t}))</td>
<td>0.257**</td>
<td>0.276**</td>
<td>0.299**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(0.1080)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(\log(Employment_{f,t}))</td>
<td>0.285**</td>
<td>0.351**</td>
<td>0.411***</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(0.0900)</td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

FTA FE    Yes    Yes    Yes    Yes    Yes    Yes
Industry FE (SIC1) No    No    Yes    Yes    No    No
Industry FE (SIC2) No    No    No    No    Yes    Yes
N         1,731  1,731  1,731  1,731  1,731  1,731
R\(^2\)   0.076  0.077  0.080  0.082  0.096  0.099

The table reports the coefficients of OLS regressions. The dependent variable is the \(\log(Lobbying expenditure_{f,j,a,t})\), the amount that firm \(f\) producing good \(j\) spent in year \(t\) to lobby in support of the ratification of agreement \(a\). The variable \(Sales_{f,t}\) is total sales by firm \(f\) in year \(t\), while \(Employment_{f,t}\) is the total number of employees of firm \(f\) in year \(t\). Standard errors in parenthesis clustered at the SIC1 level. Significance levels: ∗; 10%; ∗∗; 5%; ∗∗∗; 1%.

We next assess the validity of prediction P.2, according to which firms’ lobbying expenditure on FTAs should be proportional to the potential gains they can derive from the agreements. To this purpose, in Tables 4-6, we regress the \(\log(Lobbying expenditure_{f,j,a,t})\) on different variables capturing variation across FTAs in the potential gains firms can derive from the agreements. In these regressions, we always include firm fixed effects, exploiting variation in lobbying expenditures within firms across agreements.

In Table 4 we examine the role of pre-agreement tariffs. Our model suggests that lobbying firms should spend more in support of FTAs when they face higher tariffs to export their final goods to the FTA partners and to import intermediate inputs from them. Recall that the variable \(Tariff\) \(applied\) \(by\) \(FTA partners\) \(on\) \(the\) \(final\) \(good\) \(j,a,t−1\) captures a firm’s gains in terms of improved access to the markets of the FTA partners, following the elimination of their tariffs vis-à-vis the United States. The variable \(Tariff\) \(applied\) \(by\) \(US\) \(on\) \(inputs\) \(j,a,t−1\) captures instead the gains associated with

\[^{53}\] The 10th percentile of \(\log(Sales_{f,t})\) is 8.645 and the 90th percentile is 11.685, thus (11.685-8.645)*0.299=0.909. The 10th percentile of \(\log(Employment_{f,t})\) is 2.665 and the 90th percentile is 11.685, thus (5.621 - 2.665)*0.411=1.215.
the reduction in the cost of sourcing inputs from foreign suppliers, as a result of the elimination of U.S. tariffs on imports from FTA partners. Finally, the variable \( \text{Tariff applied by FTA partners on the final good}_{j,a,t-1} \) captures the potential increase in domestic competition as a result of the elimination of U.S. tariffs vis-à-vis FTA partners.\(^{54}\)

Table 4
Lobbying expenditures on FTAs, variation in pre-agreement tariffs

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \log(\text{Tariff applied by FTA partners on the final good}_{j,a,t-1}) )</td>
<td>0.304** (0.0935)</td>
<td>0.507** (0.1048)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>( \log(\text{Tariff applied by US on inputs}_{j,a,t-1}) )</td>
<td>2.239*** (0.1941)</td>
<td>3.354*** (0.2873)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>( \log(\text{Tariff applied by US on the final good}_{j,a,t-1}) )</td>
<td>0.092 (0.3768)</td>
<td>-0.021 (0.3474)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Firm FE: Yes, Year FE: Yes, N: 1,150, R\(^2\): 0.203

The table reports the coefficients of OLS regressions. The dependent variable is the log of \( \text{Lobbying expenditure}_{f,j,a,t} \), the amount that firm \( f \) producing good \( j \) spent in year \( t \) to lobby in support of the ratification of agreement \( a \). The variable \( \text{Tariff applied by FTA partners on final good}_{j,a,t-1} \) is the tariff applied by the partners of agreement \( a \) on imports of good \( j \) from the US in year \( t-1 \) (the year before firm \( f \) filed the lobbying report on agreement \( a \)). \( \text{Tariff applied by US on inputs}_{j,a,t-1} \) is the tariff applied by the US on imports of the inputs necessary to make good \( j \) from partners of agreement \( a \) in year \( t-1 \). \( \text{Tariff applied by US on final good}_{j,a,t-1} \) is the tariff applied by the US on imports of good \( j \) from partners of agreement \( a \) in year \( t-1 \). Standard errors in parenthesis clustered at the SIC1 level. Significance levels: *; 10%; **: 5%; ***: 1%.

In line with our model’s predictions, we find that firms’ lobbying expenditures on FTAs increase in the tariffs they face to export their final goods to the FTA partners before the agreement (the coefficient of the variable \( \text{Tariff applied by FTA partners on final good}_{j,a,t-1} \) is positive and significant). Firms’ lobbying expenditures also increase in the tariffs they face to import their inputs from FTA partners before the agreement (the coefficient of the variable \( \text{Tariff applied by US on inputs}_{j,a,t-1} \) is positive and significant). In terms of magnitude, the estimates in column 4 imply that a 1 percent increase in the \( \text{Tariff applied by FTA partners on final good}_{j,a,t-1} \) (\( \text{Tariff applied by US on inputs}_{j,a,t-1} \)) leads to a 0.5 percent increase (3.4 percent increase) in firms’ lobbying expenditures.

\(^{54}\) As explained in Section 3, these variables are defined as the maximum of the SIC4 Effectively Applied Tariff. In Table 4, we control for the minimum of all tariff variables and for the standard deviation of \( \text{Tariff applied by FTA partners on the final good}_{j,a,t-1} \) and \( \text{Tariff applied by US on inputs}_{j,a,t-1} \) (we cannot include the standard deviation of \( \text{Tariff applied by US on inputs}_{j,a,t-1} \), since this is constructed as a weighted average of the input tariffs). The results of Table 4 are robust to including only the means of the three tariff variables, constructed using the weighted average tariffs provided by WITS.
expenditures in support of the agreement. The coefficient of the variable \textit{Tariff applied by US on the final good}_{j,a,t−1} in column (4) is negative but not significant.

FTAs can boost trade among member countries not only by eliminating tariffs, but also by reducing non-tariff barriers. Indeed, trade agreements often contain detailed obligations on non-tariff issues (e.g. rules on services, investment, competition, intellectual property rights).

In Table 5 we examine whether firms’ lobbying expenditures on FTAs depend on the depth of the agreements, using the measures constructed by Dür et al. (2014) and Hofmann et al. (2018). The results show that firms spend more supporting deeper agreements, which cover a larger number of provisions that go beyond tariff liberalization.

Table 5
Lobbying expenditures on FTAs, variation in the depth of the agreements

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depth DESTA (index)_{a}</td>
<td>0.185*</td>
<td>0.0789</td>
<td></td>
</tr>
<tr>
<td>Depth DESTA (latent)_{a}</td>
<td>4.372***</td>
<td>0.8072</td>
<td></td>
</tr>
<tr>
<td>Depth World Bank,_{a}</td>
<td>0.148***</td>
<td>0.0342</td>
<td></td>
</tr>
</tbody>
</table>

Table 5: Lobbying expenditures on FTAs, variation in the depth of the agreements

Firm FE: Yes, Yes, Yes;
Year FE: Yes, Yes, Yes;
N: 1,732, 1,732, 1,732;
R^2: 0.221, 0.226, 0.230

The table reports the coefficients of OLS regressions. The dependent variable is the log of \textit{Lobbying expenditure}_{f,a,t}, the amount that firm \textit{f} spent in year \textit{t} to lobby in support of the ratification of agreement \textit{a}. \textit{Depth DESTA (index)_{a}} and \textit{Depth DESTA (latent)_{a}} measure the depth of agreement \textit{a} as measured by Dür et al. (2014). \textit{Depth World Bank,_{a}} measures the depth of agreement \textit{a} as measured by Hofmann et al. (2018). Standard errors in parenthesis clustered at the SIC1 level. Significance levels: *: 10%; **: 5%; ***: 1%.

Another implication of prediction P.2 of our model, is that firms should spend more supporting trade agreements when the FTA partners are larger, in terms of their export and sourcing potential. To verify this, we regress firms’ lobbying expenditures on different proxies for the size of the FTA partners. The results are reported in Table 6.
<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>log(GDP of FTA partners_{a,t-1})</td>
<td>0.310***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.0637)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>log(Export potential of FTA partners_{j,a,t-1})</td>
<td>0.259**</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.0924)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>log(Sourcing potential of FTA partners_{j,a,t-1})</td>
<td>0.076*</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.0371)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Firm FE       Yes    Yes    Yes
Year FE       Yes    Yes    Yes
N             1,821  1,294  1,327
R²            0.202  0.204  0.225

The table reports the coefficients of OLS regressions. The dependent variable is the log of Lobbying expenditure_{f,j,a,t}, the amount that firm f producing good j spent in year t to lobby in support of the ratification of agreement a. GDP of FTA partners_{a,t-1} is the GDP of the partner(s) of agreement a in year t − 1 (the year before firm f filed the lobbying report on agreement a). Export potential of FTA partners_{j,a,t-1} is US exports of good j to the partner(s) of agreement a in year t − 1. Sourcing potential of FTA partners_{j,a,t-1} is US imports of the inputs of good j from the partner(s) of agreement a in year t − 1. Significance levels: *; 10%; **: 5%; ***: 1%.

In column 1, we use the variable GDP of FTA partners_{a,t-1} to capture the export and sourcing potential of the FTA partners’ markets. The positive and significative coefficient of this variable indicates that US firms spend more lobbying in support of trade agreements with larger FTA partners. The positive and significant coefficient of the variable Export potential of FTA partners_{j,a,t-1} in column 2 shows that lobbying firms spend more when FTA partners are larger in terms of demand for their final goods. The positive and significant coefficient of the variable Sourcing potential of FTA partners_{j,a,t-1} in column 3 indicates that firms spend more in support of trade agreement when the FTA partners are larger in terms of their ability to produce of their inputs. In terms of magnitude, the estimate implies that a 1 percent increase in GDP of FTA partners_{j,a,t-1} leads to a 0.3 percent increase in lobbying expenditure. Similarly, a 1 percent increase in Export potential of FTA partners_{j,a,t-1} and Sourcing potential of FTA partners_{j,a,t-1} lead respectively to a 0.29 and a 0.08 percent increase in firms’ lobbying expenditures on trade agreements.\footnote{We also tried including a variable capturing the extent to which US firms suffer from import competition from FTA partners, measured by US imports of good j from the partner(s) of agreement a in year t − 1. Information to construct this variable is missing for many country-sector. When using this variable, the number of observations is reduced to less than 900 and the coefficient is insignificant.}
The results of Tables 4-6 provide strong support for the first prediction of our model, according to which lobbying expenditures in support of the ratification of FTAs should increase in the potential gains that firms can derive from the agreement.

We next move to assess the validity of the third prediction of our model, according to which firms should spend more lobbying in favor of FTAs when US legislators are less likely to be in favor of their ratification. To this purpose, we regress a firm’s lobbying expenditures against the variables Share of Democrats in Congress and Divided Government, which capture variation in expected political support for FTA ratification. The results are reported in Table 7.

Table 7
Lobbying expenditures on FTAs, variation in the probability of a political bias against ratification

<table>
<thead>
<tr>
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<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Share of Democrats in Congress1_t</td>
<td>11.567**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(4.0433)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Share of Democrats in Congress2_t</td>
<td>12.462**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(4.0538)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Divided Government1_t</td>
<td>1.347***</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.2696)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Divided Government2_t</td>
<td>1.615***</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.3696)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Firm FE Yes Yes Yes Yes
Year FE Yes Yes Yes Yes
N 1,821 1,821 1,821 1,821
R² 0.083 0.084 0.104 0.097

The table reports the coefficients of OLS regressions. The dependent variable is the log of Lobbying expenditure_{f,a,t}, the amount that firm f spent in year t to lobby in support of the ratification of agreement a. Share of Democrats in Congress1_t (Share of Democrats in Congress2_t) measures the share of congressmen belonging to the Democratic party in year t (including independent congressmen who caucus with the Democrats). Divided Government1_t (Divided Government2_t) is a dummy variable equal to 1 if in year t one party controls the executive branch, while the other party controls at least one of the houses (both houses) of the legislative branch. Standard errors in parenthesis clustered at the SIC1 level. Significance levels: *; 10%; **: 5%; ***: 1%.

In line with prediction P.3, the coefficients of the variable Share of Democrats in Congress_t are

56 One may think of using variation in the outcome of ratification votes in Congress to proxy for the political bias in favor or against FTAs: although most agreements were ratified by a sizeable majority, some votes (e.g. ratification of CAFTA) were very close, and in one case (the first FTA negotiated with Columbia) the agreement did not reach the Congress floor because of lack of enough political support. However, vote outcomes reflect firms’ lobbying efforts and are thus not a good proxy for the political bias B faced by firms ex-ante (i.e. at the time of their lobbying decisions).
positive and significant, confirming that firms spend more lobbying in favor of trade agreements when legislators are more likely to be protectionist. The positive and significant coefficients of the variable *Divided Government* indicate that firms tend to spend more on FTAs when Congress is not politically aligned with the executive and is thus less inclined to ratify trade agreements.

To assess the robustness of our results on firms’ lobbying expenditures, we have performed a series of additional estimations. In Tables 3-7 above, we have clustered standard errors at the SIC1 level. We have verified that the results continue to hold if use broader (SIC Division-level) or narrower (firm-level) clusters. We have also explored another intensive margin of lobbying, i.e. the number of reports filed by firms. We find that larger firms lobby more often, i.e. file more reports on the same FTA (see Table A-6). We also find that individual firms file more reports when they have more to gain from the agreement, in terms of the reduction in the tariffs on their final goods and their intermediate inputs, the depth of the agreement, and the export and sourcing potential of the FTA partners (see Tables A-7 - A-9) and when US legislators are less likely to be in favor of their ratification (see Table A-10).

7 Conclusion

Recent decades have seen a proliferation of trade agreements. In this paper, we have studied the role of firms in shaping support for the ratification of these agreements.

The contribution of our paper is threefold. First, using detailed information from lobbying reports filed under the Lobbying Disclosure Act, we have constructed a unique dataset allowing us to trace firms’ lobbying expenditures on the ratification of FTAs negotiated by the United States.

Second, using this dataset, we have uncovered novel facts about firms lobbying on trade agreements. We show that i) firms that lobby on FTAs are virtually always (in over 99 percent of the cases) in favor of their ratification, and that ii) lobbying firms are larger and iii) more likely to be engaged in international trade than non-lobbying firms. These facts cannot be explained by the workhorse model of the political economy of FTAs by Grossman and Helpman (1995a), which focuses on lobbying by industry groups rather than firms.

The third contribution of our paper is to develop a new model of the political economy of FTAs. In our model, heterogeneous oligopolistic firms choose whether to lobby and how much to spend in favor or against a proposed FTA, when they are uncertain about legislators’ stance on the agreement. We have derived conditions under which the most productive firms select into lobbying and support the FTA, while less productive firms cannot afford to pay the fixed lobby costs and remain unorganized.

Our model provides a rationale for our key empirical finding that lobbying firms always support FTAs. It is also consistent with the fact that lobbying on trade agreements is a rare event, involving
This model delivers predictions about the intensive margin of lobbying. In line with these predictions, we find that larger firms spend more supporting trade agreements, and individual firms spend more when their potential gains from the agreement are larger – in terms of the reduction in the tariffs on their final goods and their intermediate inputs, the depth of the agreement, and the export and sourcing potential of the FTA partners – and when legislators are less likely to be in favor of ratification.

Our results differ from the standard view that trade liberalization efforts are met by staunch opposition by special interests groups. When considering the interests of heterogeneous firms, we show that only the largest most productive firms select into lobbying. Given that FTAs are reciprocal and cover multiple sectors, they can benefit large firms by allowing them to expand sales of their final goods in foreign markets and to access cheaper foreign inputs. This is of course not to say that large firms are always in favor of free trade. Indeed, they often support protectionist measures such as antidumping or countervailing duties, which can be targeted to imports of particular products from specific countries. Our results are thus not in contradiction with the findings of previous studies that focused on industry-level lobbying on unilateral and sector-specific trade policies (e.g. Goldberg and Maggi, 1999; Gawande and Bandyopadhyay, 2000).

Our findings resonate with Rodrik (2018)’s view that “trade agreements are the result of rent-seeking, self-interested behavior on the part of politically well-connected firms.” In line with this argument, we show theoretically and empirically that the political economy of FTAs is dominated by a few large firms, which can benefit from trade agreements and lobby in favor of their ratification.

We see this paper as a first step in understanding how lobbying by heterogeneous firms can shape the politics of trade agreements. Our main dataset is based on all lobbying reports that explicitly mention bills for the ratification of FTAs in the US Congress. By this stage, trade agreements have already been negotiated and signed by the executive, so firms can only affect legislators’ decision on whether or not to ratify them. This is consistent with our theoretical model, in which firms’ lobbying expenditures affect the probability that a proposed FTA is ratified.

An important avenue of future research is to understand to what extent firms can shape the content of trade agreements. Addressing this question requires collecting all lobbying reports filed by firms during the negotiations of FTAs, using keywords rather than bill numbers to identify reports related to specific trade agreements (as done, for example, in Figure A-4 for KORUS agreement). Using this extended dataset, we could verify whether firms try to influence the length of the tariff phase-out periods\(^{58}\) or the rules of origin (RoO) contained in a FTA\(^{59}\). This would also require

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\(^{57}\) Similar patterns have been documented by Kerr et al. (2014) and Kang (2016), who find that only a few large firms lobby on immigration and energy policy.

\(^{58}\) For example, in the case of North American Free Trade Agreement (NAFTA), 23.75 percent of U.S. tariffs were already at 0 before the agreement, 52.5 percent were eliminated immediately, and the remaining tariffs were eliminated after phase out periods ranging between 5 and 15 years (Besedes et al., 2017).

\(^{59}\) For example, there is some evidence that during the negotiations of the NAFTA agreement firms that were...
collecting detailed information on the structure of the phase-out periods (as in Hakobyan et al., 2018) and on the RoO contained in each agreement (as in Conconi et al., 2018). On the theoretical front, we would need to model endogenous implementation periods and RoO restrictions. It would also be interesting to examine whether firms can shape provisions on non-trade issues (e.g. rules on intellectual property rights and investment). Anecdotal evidence suggests that large corporations are be able to “buy” favorable provisions in trade agreements.

Another interesting avenue of future research is to explore the role of trade unions. The data we have collected shows that, although unions spend much less than firms lobbying on FTAs, they almost always oppose the ratification of trade agreements (see Figure A-3).

subject to strong import competition (e.g. textile producers) lobbied for stringent RoO on their inputs, while firms that were already dependent on multinational supply chains (e.g. IBM), pushed for lenient RoO (see Chase, 2003).

Extending the model to the complete exclusion of products does not seem to be empirically relevant: in line with the “substantially all trade” clause of article Article XXIV of the GATT/WTO, the United States almost never excludes products from its FTAs. For example, it did not exclude any HS8 good in the NAFTA agreement; the highest percentage of products excluded by the US is 1.73 (in the case of the FTA with Australia). We thank Shushanik Hakobyan, Tristan Kohl, and James Lake for providing us with this information.

For example, in the first quarter of 2012, GlaxoSmithKline spent $2,120,000 lobbying on the “Trans-Pacific Strategic Economic Partnership Agreement (TPP) - provisions related to intellectual property,” among other issues. Other pharmaceutical companies spent considerable amounts lobbying on this agreement. The text of the TPP agreement seems to reflect these lobbying efforts, since it contains various provisions that are particularly favorable to drug manufacturers (e.g. strengthening patent exclusivity, providing protections against bulk government purchasing).
References


A 1 Empirical Appendix

A 1.1 Data

Figure A-1
Lobbying expenditures vs campaign contributions (all issues)

The figure reports the total amounts of lobbying expenditures and campaign contributions on all policy issues, between the 105th Congress (1997-1998) and the 114th Congress (2015-2016). The data come from the Center for Responsive Politics (see http://www.OpenSecrets.org).
Table A-2

Ratification bills of FTAs negotiated by the United States

<table>
<thead>
<tr>
<th>FTA partner</th>
<th>Date of entry Into Force</th>
<th>Bill Number in the House</th>
<th>Bill Number in Senate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jordan</td>
<td>December 17, 2001</td>
<td>H.R.2603</td>
<td>S. 643</td>
</tr>
<tr>
<td>Chile</td>
<td>January 1, 2004</td>
<td>H.R.2738</td>
<td>S. 1416</td>
</tr>
<tr>
<td>Singapore</td>
<td>January 1, 2004</td>
<td>H.R.2739</td>
<td>S. 1417</td>
</tr>
<tr>
<td>Australia</td>
<td>January 1, 2005</td>
<td>H.R.4759</td>
<td>S. 2610</td>
</tr>
<tr>
<td>Morocco</td>
<td>January 1, 2006</td>
<td>H.R.4842</td>
<td>S. 2677</td>
</tr>
<tr>
<td>Bahrain</td>
<td>January 11, 2006</td>
<td>H.R.4340</td>
<td>S. 2027</td>
</tr>
<tr>
<td>CAFTA-DR (El Salvador)</td>
<td>March 1, 2006</td>
<td>H.R.3045</td>
<td>S. 1307</td>
</tr>
<tr>
<td>CAFTA-DR (Honduras)</td>
<td>April 1, 2006</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CAFTA-DR (Nicaragua)</td>
<td>April 1, 2006</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CAFTA-DR (Guatemala)</td>
<td>July 1, 2006</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CAFTA-DR (Dominican Rep.)</td>
<td>March 1, 2007</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CAFTA-DR (Costa Rica)</td>
<td>January 1, 2009</td>
<td>H.R.3045</td>
<td>S. 1307</td>
</tr>
<tr>
<td>Oman</td>
<td>January 1, 2009</td>
<td>H.R.5684</td>
<td>S. 3569</td>
</tr>
<tr>
<td>Peru</td>
<td>February 1, 2009</td>
<td>H.R.3688</td>
<td>S. 2113</td>
</tr>
<tr>
<td>Colombia (1)</td>
<td>-</td>
<td>H.R.5724</td>
<td>S. 2830</td>
</tr>
<tr>
<td>Korea</td>
<td>March 15, 2012</td>
<td>H.R.3080</td>
<td>S. 1642</td>
</tr>
<tr>
<td>Colombia (2)</td>
<td>May 15, 2012</td>
<td>H.R.3078</td>
<td>S. 1641</td>
</tr>
<tr>
<td>Panama</td>
<td>October 31, 2012</td>
<td>H.R.3079</td>
<td>S. 1643</td>
</tr>
</tbody>
</table>
Table A-1
Descriptive statistics on firms lobbying on FTA ratification bills

<table>
<thead>
<tr>
<th></th>
<th>Observations</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lobbying expenditure (f,k,a)</td>
<td>277</td>
<td>290,555</td>
</tr>
<tr>
<td>Number of reports (f,a)</td>
<td>277</td>
<td>2.899</td>
</tr>
<tr>
<td>Firms lobbying directly (f,a)</td>
<td>193</td>
<td>70.44%</td>
</tr>
<tr>
<td>Firms lobbying indirectly (f,a)</td>
<td>63</td>
<td>22.99%</td>
</tr>
<tr>
<td>Firms lobbying directly and indirectly (f,a)</td>
<td>18</td>
<td>6.57%</td>
</tr>
</tbody>
</table>

The variable *Lobbying expenditure* \(f,k,a\) is the total amount (in US dollars) spent by firm \(f\) in sector \(k\) to lobby in support of the ratification of agreement \(a\). *Number of Reports* \(f,a\) is the number of reports filed by firm \(f\) in support of the ratification of agreement \(a\). The last three variables are indicators capturing different lobbying modes: *Firms lobbying directly* \(f,a\) is equal to 1 if firm \(f\) lobbies on FTA \(a\) through its own lobbying department; *Firms lobbying indirectly* \(f,a\) is equal to 1 if firm \(f\) lobbies on FTA \(a\) through a lobbying firm; and *Firms lobbying directly and indirectly* \(f,a\) is equal to 1 if firm \(f\) lobbies on FTA \(a\) both through its own lobbying department and through a lobbying firm.
Table A-2
Descriptive statistics, lobbying vs. non-lobbying firms

<table>
<thead>
<tr>
<th></th>
<th>Lobbying Firms</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Observations</td>
<td>Mean</td>
<td>Std. Dev.</td>
<td>Min</td>
<td>Max</td>
</tr>
<tr>
<td>Sales&lt;sub&gt;f,t&lt;/sub&gt;</td>
<td>257</td>
<td>63,244.38</td>
<td>86,975.4</td>
<td>329.77</td>
<td>444,948</td>
</tr>
<tr>
<td>Employment&lt;sub&gt;f,t&lt;/sub&gt;</td>
<td>251</td>
<td>159.383</td>
<td>339.660</td>
<td>1.252</td>
<td>2,200</td>
</tr>
<tr>
<td>Tradable sector&lt;sub&gt;f&lt;/sub&gt;</td>
<td>239</td>
<td>0.678</td>
<td>0.468</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Exporter and/or importer&lt;sub&gt;f,t&lt;/sub&gt;</td>
<td>140</td>
<td>0.9928</td>
<td>0.0845</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Non-Lobbying Firms</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Observations</td>
<td>Mean</td>
<td>Std. Dev.</td>
<td>Min</td>
<td>Max</td>
</tr>
<tr>
<td>Sales&lt;sub&gt;f,t&lt;/sub&gt;</td>
<td>95,275</td>
<td>2,693.97</td>
<td>12,742.31</td>
<td>-15,009.33</td>
<td>470,171</td>
</tr>
<tr>
<td>Employment&lt;sub&gt;f,t&lt;/sub&gt;</td>
<td>87,296</td>
<td>8.450</td>
<td>36.984</td>
<td>0</td>
<td>2,545</td>
</tr>
<tr>
<td>Tradable sector&lt;sub&gt;f&lt;/sub&gt;</td>
<td>105,997</td>
<td>0.406</td>
<td>0.491</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Exporter and/or importer&lt;sub&gt;f,t&lt;/sub&gt;</td>
<td>21,639</td>
<td>0.7803</td>
<td>0.0845</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

Sales<sub>f,t</sub> is total sales (in millions of US dollars) by firm <i>f</i> in year <i>t</i>. Employment<sub>f,t</sub> is the total number of employees (in thousands) of firm <i>f</i> in year <i>t</i>. Tradable sector<sub>f</sub> is a dummy variable equal to 1 if firm <i>f</i> operates in a tradable sector. Exporter and/or importer<sub>f,t</sub> is a dummy variable equal to 1 if firm <i>f</i> exports and/or imports in year <i>t</i>.
Table A-3
Descriptive statistics, determinants of firms’ lobbying expenditures on FTAs

<table>
<thead>
<tr>
<th></th>
<th>Observations</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lobbying expenditure</td>
<td>259</td>
<td>283,207.5</td>
<td>397,399.8</td>
<td>3,333.3</td>
<td>2,770,000</td>
</tr>
<tr>
<td>Tariff applied by FTA</td>
<td>162</td>
<td>34.33</td>
<td>124.62</td>
<td>0</td>
<td>800.3</td>
</tr>
<tr>
<td>partners on the final</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>good</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tariff applied by US</td>
<td>156</td>
<td>0.145</td>
<td>0.51</td>
<td>0</td>
<td>3.93</td>
</tr>
<tr>
<td>on inputs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tariff applied by US</td>
<td>156</td>
<td>3.35</td>
<td>9.99</td>
<td>0</td>
<td>70.83</td>
</tr>
<tr>
<td>on final good</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depth of the FTA</td>
<td>224</td>
<td>6.540</td>
<td>0.526</td>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td>(DESTA index)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depth of the FTA</td>
<td>224</td>
<td>2.073</td>
<td>0.120</td>
<td>1.223</td>
<td>2.170</td>
</tr>
<tr>
<td>(DESTA latent)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depth of the FTA</td>
<td>224</td>
<td>59.870</td>
<td>4.474</td>
<td>28</td>
<td>63</td>
</tr>
<tr>
<td>(World Bank)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GDP of FTA partners</td>
<td>256</td>
<td>309,063</td>
<td>362,615.2</td>
<td>14,339.97</td>
<td>1,134,795</td>
</tr>
<tr>
<td>Export potential of FTA</td>
<td>193</td>
<td>4,416.7</td>
<td>5,444.47</td>
<td>0.022</td>
<td>21,719.35</td>
</tr>
<tr>
<td>partners</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sourcing potential of FTA</td>
<td>156</td>
<td>36.46</td>
<td>124.08</td>
<td>0.0002</td>
<td>1,368.05</td>
</tr>
<tr>
<td>Competition from FTA</td>
<td>139</td>
<td>251.77</td>
<td>1,562.83</td>
<td>0.001</td>
<td>16,552.91</td>
</tr>
<tr>
<td>partners</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Share of Democrats in</td>
<td>256</td>
<td>0.479</td>
<td>0.033</td>
<td>0.456</td>
<td>0.533</td>
</tr>
<tr>
<td>Congress1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Share of Democrats in</td>
<td>256</td>
<td>0.482</td>
<td>0.033</td>
<td>0.460</td>
<td>0.537</td>
</tr>
<tr>
<td>Congress2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Divided Government1</td>
<td>256</td>
<td>0.699</td>
<td>0.460</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Divided Government2</td>
<td>256</td>
<td>0.270</td>
<td>0.445</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

The variable *Lobbying expenditure* is the total amount (in US dollars) spent by firm *f* producing good *j* in support of the ratification of agreement *a* in year *t*. *Tariff applied by FTA partners on the final good* is the maximum SIC4 tariff applied by the partners of agreement *a* on imports of good *j* from the US in year *t* – 1 (the year before firm *f* filed the lobbying report on agreement *a*). *Tariff applied by US on inputs* is a weighted average of the maximum SIC4 tariff applied by the US on imports of the top 100 inputs of good *j* from the partners of agreement *a* in year *t* – 1 (with the IO coefficients used as weights). *Tariff applied by US on inputs* is the average of the maximum SIC4 tariffs applied by the US on imports of the top 100 inputs of good *j* from the partners of agreement *a* in year *t* – 1. *Tariff applied by US on the final good* is the maximum SIC4 tariff applied by the US on imports of good *j* from the partners of agreement *a* in year *t* – 1 (in millions of US dollars). *GDP of FTA partners* is the GDP of the partners of agreement *a* in year *t* – 1 (in millions of US dollars). *Export potential of FTA partners* is total US exports (in millions of US dollars) of good *j* to the partner(s) of agreement *a* in year *t* – 1. *Sourcing potential of FTA partners* is US imports (in millions of US dollars) of good *j* from the partner(s) of agreement *a* in year *t* – 1. *Competition from FTA partners* is US imports (in millions of US dollars) of good *j* from the partner(s) of agreement *a* in year *t* – 1. *Depth DESTA (index)* and *Depth DESTA (latent)* measure the depth of agreement *a* as measured by Dür et al. (2014). *Depth World Bank* measures the depth of agreement *a* as measured by Hofmann et al. (2017). *Share of Democrats in Congress1* (Share of Democrats in Congress2) measures the share of congressmen belonging to the Democratic party in year *t* (including independent congressmen who caucus with the Democrats). *Divided Government1* (Divided Government2) is a dummy variable equal to 1 if in year *t* one party controls the executive branch, while the other party controls at least one of the houses (both houses) of the legislative branch.
The figure reports total lobbying expenditures in favor and against FTAs by manufacturing firms and firm associations, as well as trade unions, based on all lobbying reports that mention the FTA ratification bills.
Figure A-4
Lobbying reports on US-Korea FTA

The figure reports the number of lobbying reports filed by firms related to the US-Korea FTA.

Figure A-5
Firms’ position on the US-Korea FTA (based on keywords)

The figure reports the share of observations in which firms lobbied in favor or against the US-Korea FTA, based on all lobbying reports related to the agreement filed by firms during the 2000-2011 period.
Figure A-6
Lobbying Report (Example 1)

LOBBYING REPORT
Lobbying Disclosure Act of 1995 (Section 5): All Filers Are Required To Complete This Page

1. Registrant Name:

DAIMLERCHRYSLER CORP/DAIMLER BENZ OF WASHINGTON

2. Address
1401 H ST #700, WASHINGTON, DC 20005

3. Principal place of business (if different from line 3):
City: ALBANY HILLS State/Zip Code: MI 48325

4. Contact Name: TIMOTHY MCBRIDE
Telephone: 202-414-6756
E-mail (optional): tim6@daimlerchrysler.com

Senate ID #: 49043.12
House ID #: 34607-000

7. Client Name: [X] Sell

TYPE OF REPORT

8. Year: 2004 Midyear (January 1 - June 30): [X] OR Year End (July 1 - December 31): [ ]

9. Check if this filing amends a previously filed version of this report: [ ]

10. Check if this is a Termination Report: [ ] Termination Date: Dec 30, 1999 11. No Lobbying Activity: [ ]

INCOME OR EXPENSES
Complete Either Line 12 OR Line 13

12. Lobbying Firms

INCOME relating to lobbying activities for this reporting period was:

Less than $10,000: [ ]

$10,000 or more: [ ] -> Income (nearest $20,000): [ ]

Provide a good faith estimate, rounded to the nearest $20,000, of all lobbying related income from the client (including all payments to the registrant by any other entity for lobbying activities on behalf of the client).

13. Organizations

EXPENSES relating to lobbying activities for this reporting period were:

Less than $10,000: [ ]

$10,000 or more: [X] -> Expenses (nearest $20,000): $2,466,317.00

14. Reporting Method
Check box to indicate expense accounting method. See instructions for description of options.

[ ] Method A. Reporting amounts using LDA definitions only
[ ] Method B. Reporting amounts under section 6033(b)(8) of the Internal Revenue Code
[X] Method C. Reporting amounts under section 162(e) of the Internal Revenue Code
Lobbying Report (Example 1 Cont.)

Registrant Name: DAIMLERCHRYSLER CORP/DAIMLER BENZ OF WASHINGTON Client Name: Self

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

15. General issue area code: AUI (one per page)

16. Specific lobbying issues:

17. House(s) of Congress and Federal agencies contacted:
Defense, Dept of (DOM)
Energy, Dept of
Environmental Protection Agency (EPA)
HOUSE OF REPRESENTATIVES
Interior, Dept of (DOI)
Natl Highway Traffic Safety Administration (NHTSA)
SENATE
Transportation, Dept of (DOT)

18. Name of each individual who acted as a lobbyist in this issue area:
Name: CRAYON, WILLIAM
Covered Official Position (if applicable): N/A
Name: DAY, BRENDA
Covered Official Position (if applicable): N/A
Name: FELICE, BARRY
Covered Official Position (if applicable): N/A
Name: FITZGIBBONS, DENNIS
Covered Official Position (if applicable): N/A
Name: MCBRIDE, TIMOTHY
Covered Official Position (if applicable): N/A

19. Interest of each foreign entity in the specific issues listed on line 16 above.
DaimlerChrysler Corporation is a wholly-owned subsidiary of DaimlerChrysler AG which is incorporated in Germany.

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

15. General issue area code: TRD (one per page)

16. Specific lobbying issues:

17. House(s) of Congress and Federal agencies contacted:
Commerce, Dept of (DOC)
HOUSE OF REPRESENTATIVES
SENATE
State, Dept of (DOS)
U.S. Trade Representative (USTR)

18. Name of each individual who acted as a lobbyist in this issue area:
Name: KISSEL, MARIE
Covered Official Position (if applicable): N/A
Name: MCBRIDE, TIMOTHY
Covered Official Position (if applicable): N/A
Name: MOLNAR, YANCY
Covered Official Position (if applicable): N/A

19. Interest of each foreign entity in the specific issues listed on line 16 above.
DaimlerChrysler Corporation is a wholly-owned subsidiary of DaimlerChrysler AG which is incorporated in Germany.

Signature: ON FILE Date: Sep 28, 2004
Printed Name and Title: JAKE JONES - SENIOR MANAGER - LEGISLATIVE AFFAIRS
Lobbying Disclosure Act of 1995 (Section 5) - All Filers Are Required to Complete This Page

1. **Registrant Name**
   - Organization/Lobbying Firm
   - Self Employed Individual
   - PMI Global Services Inc.

2. **Address**
   - Address 1: 700 13th Street, NW
   - Address 2: Suite 325
   - City: Washington
   - State: DC
   - Zip Code: 20050
   - Country: USA

3. **Principal place of business (if different than line 2)**
   - City: New York
   - State: NY
   - Zip Code: 10017
   - Country: USA

4. **Contact Information**
   - Telephone Number: 2024952661
   - E-mail: beverly.mckittrick@pmintl.com

5. **Senate ID#**
   - 400265213-12

6. **House ID#**
   - 401470000

**TYPE OF REPORT**
- 8. Year: 2008
- 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

11. No Lobbying Issue Activity

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

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

13. **Organizations**
   - **EXPENSE** relating to lobbying activities for this reporting period were:
     - Less than $5,000
     - $5,000 or more: $1,020,000.00

14. **REPORTING** Check box to indicate expense accounting method.
    See instructions for description of options.
    - **Method A.** Reporting amounts using LDA definitions only
    - **Method B.** Reporting amounts under section 6033(b)(8) of the Internal Revenue Code
    - **Method C.** Reporting amounts under section 162(e) of the Internal Revenue Code

**Signature**
Digitally Signed By: Beverly Mckittrick, Director, U.S. Government Affairs
Date: 10/20/2008

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

15. General issue area code TRD
16. Specific lobbying issues

HR 5724/S 2830 - United States-Colombia Trade Promotion Agreement Implementation Act; To implement the United States - Colombia Trade Promotion Agreement; enactment of entire bill

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

U.S. SENATE, U.S. HOUSE OF REPRESENTATIVES
Figure A-8
Lobbying Report (Example 3)

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

<table>
<thead>
<tr>
<th>1. Registrant Name</th>
<th>Organization/Lobbying Firm</th>
<th>Self Employed Individual</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>UNITED STATES STEEL CORPORATION</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2. Address</th>
<th>Address 1</th>
<th>901 K Street, NW</th>
<th>Address 2</th>
<th>Suite 1250</th>
</tr>
</thead>
<tbody>
<tr>
<td>City</td>
<td>WASHINGTON</td>
<td>State</td>
<td>DC</td>
<td>Zip Code</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>20001</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3. Principal place of business (if different than line 2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>City</td>
</tr>
<tr>
<td>------</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>4a. Contact Name</th>
<th>b. Telephone Number</th>
<th>c. E-mail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mr. Thomas M. Sneed</td>
<td>202-783-3333</td>
<td><a href="mailto:jw3indsey@usa.com">jw3indsey@usa.com</a></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5. Senate ID#</th>
<th>71553-12</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>7. Client Name</th>
<th>Self</th>
<th>Check if client is a state or local government or instrumentality</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNITED STATES STEEL CORPORATION</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>6. House ID#</th>
<th>35804000</th>
</tr>
</thead>
</table>

**TYPE OF REPORT**

- 8. Year: 2011
- 9. Check if this filing amends a previously filed version of this report
- 10. Check if this is a Termination Report
- 11. No Lobbying Issue Activity

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

12. Lobbying

**INCOME relating to lobbying activities for this reporting period was:**

- Less than $5,000
- $5,000 or more

Provide a good faith estimate, rounded to the nearest $10,000, of all lobbying related income from the client (including all payments to the registrant by any other entity for lobbying activities on behalf of the client).

13. Organizations

**EXPENSE relating to lobbying activities for this reporting period were:**

- Less than $5,000
- $5,000 or more

**Payment Amount:** $800,000.00

14. REPORTING Check box to indicate expense accounting method. See instructions for description of options.

- Method A: Reporting amounts using LDA definitions only
- Method B: Reporting amounts under section 6333(b)(8) of the Internal Revenue Code
- Method C: Reporting amounts under section 162(c) of the Internal Revenue Code

**Signature**

Digitally Signed By: Thomas M. Sneed, Managing Director-Federal Governmental Affairs

Date: 10/14/2011

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

15. General issue area code TRD

16. Specific lobbying issues

- Implementation and enforcement of U.S. trade laws as follows: H.R.39, Currency Reform for Fair Trade Act
- H.R.1259, Congressional Made in America Promotion Act of 2011
- S.1155/H.R.3057, Enforcing Orders and Reducing Customs Evasion Act of 2011, entire bill
- S.452, Currency Exchange Rate Oversight Reform Act, entire bill
- H.R.3900, United States - Korea Free Trade Agreement, entire bill

17. House(s) of Congress and Federal agencies

- Check if None

U.S. HOUSE OF REPRESENTATIVES, U.S. SENATE
A 2 Robustness Checks

Table A-4
Probability of lobbying on FTAs, the role of firm size
(alternative econometric methodology)

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>log(Sales(_{f,t}))</td>
<td>0.0022***</td>
<td>0.006***</td>
</tr>
<tr>
<td>log(Employment(_{f,t}))</td>
<td></td>
<td>(0.0004)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.0011)</td>
</tr>
<tr>
<td>FTA FE</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Industry FE</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>N</td>
<td>87,188</td>
<td>87,188</td>
</tr>
<tr>
<td>R(^2)</td>
<td>0.093</td>
<td>0.102</td>
</tr>
</tbody>
</table>

Notes: The table reports the coefficients of a linear probability model. The dependent variable is Lobbying on FTA\(_{f,j,a,t}\) is a dummy equal to 1 if firm \(f\) producing good \(j\) lobbies on the ratification of agreement \(a\) in year \(t\). The variable Sales\(_{f,t}\) is total sales by firm \(f\) in year \(t\), while Employment\(_{f,t}\) is the total number of employees of firm \(f\) in year \(t\). Industry fixed effects defined at the SIC2 level. Standard errors in parenthesis clustered at the firm level. Significance levels: *; 10%; **: 5%; ***: 1%.

Table A-5
Probability of lobbying on FTAs, the role of trade participation
(alternative econometric methodology)

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tradable sector(_f)</td>
<td>0.002***</td>
<td>0.004***</td>
<td>0.005***</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.0006)</td>
<td>(0.0004)</td>
<td>(0.0007)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exporter and/or importer(_{f,t})</td>
<td>0.006***</td>
<td>0.002</td>
<td>0.001</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.0016)</td>
<td>(0.0016)</td>
<td>(0.0015)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>log(Sales(_{f,t}))</td>
<td>0.002***</td>
<td></td>
<td>0.005***</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.0004)</td>
<td></td>
<td>(0.0008)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>log(Employment(_{f,t}))</td>
<td>0.006***</td>
<td></td>
<td>0.010***</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.0010)</td>
<td></td>
<td>(0.0017)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FTA FE</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Industry FE (SIC2)</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>N</td>
<td>83,486</td>
<td>83,486</td>
<td>83,486</td>
<td>20,801</td>
<td>20,801</td>
<td>20,801</td>
</tr>
<tr>
<td>R(^2)</td>
<td>0.099</td>
<td>0.108</td>
<td>0.116</td>
<td>0.115</td>
<td>0.133</td>
<td>0.141</td>
</tr>
</tbody>
</table>

The table reports the coefficients of a linear probability model. The dependent variable is Lobbying on FTA\(_{f,j,a,t}\) is a dummy equal to 1 if firm \(f\) producing good \(j\) lobbies on the ratification of agreement \(a\) in year \(t\). The variable Tradable sector\(_f\) is a dummy equal to 1 if firm \(f\) operates in a tradable sector. The dummy Exporter and/or importer\(_{f,t}\) is equal to 1 if firm \(f\) exports and/or imports in year \(t\). The variable Sales\(_{f,t}\) is total sales by firm \(f\) in year \(t\), while Employment\(_{f,t}\) is the total number of employees of firm \(f\) in year \(t\). Standard errors in parenthesis clustered at the SIC1 level. Significance levels: *; 10%; **: 5%; ***: 1%.
### Table A-6
Number of reports on FTAs, variation in firm size

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>log (Sales&lt;sub&gt;f,t&lt;/sub&gt;)</td>
<td>0.035*</td>
<td>0.039*</td>
<td>0.040**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.0174)</td>
<td>(0.0189)</td>
<td>(0.0151)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>log (Employment&lt;sub&gt;f,t&lt;/sub&gt;)</td>
<td>0.042**</td>
<td>0.053**</td>
<td>0.058***</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.0135)</td>
<td>(0.0201)</td>
<td>(0.0131)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FTA FE</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Industry FE (SIC1)</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Industry FE (SIC2)</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>N</td>
<td>1,731</td>
<td>1,731</td>
<td>1,731</td>
<td>1,731</td>
<td>1,731</td>
<td>1,731</td>
</tr>
<tr>
<td>R&lt;sup&gt;2&lt;/sup&gt;</td>
<td>0.074</td>
<td>0.075</td>
<td>0.078</td>
<td>0.080</td>
<td>0.099</td>
<td>0.101</td>
</tr>
</tbody>
</table>

The table reports the coefficients of OLS regressions. The dependent variable is the log of Reports<sub>f,j,a,t</sub>, the number of reports filed by firm <i>f</i> producing good <i>j</i> in year <i>t</i> to lobby in support of the ratification of agreement <i>a</i>. The variable Sales<sub>f,t</sub> is total sales by firm <i>f</i> in year <i>t</i>, while Employment<sub>f,t</sub> is the total number of employees of firm <i>f</i> in year <i>t</i>. Standard errors in parenthesis clustered at the SIC1 level. Significance levels: *: 10%; **: 5%; ***: 1%.

### Table A-7
Number of reports on FTAs, variation in pre-agreement tariffs

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>log(Tariff applied by FTA partners on the final good&lt;sub&gt;f,j,a,t−1&lt;/sub&gt;)</td>
<td>0.048***</td>
<td>0.082*</td>
<td></td>
<td>(0.0063) (0.0236)</td>
</tr>
<tr>
<td>log(Tariff applied by US on inputs&lt;sub&gt;f,j,a,t−1&lt;/sub&gt;)</td>
<td>0.452***</td>
<td>0.719***</td>
<td>(0.0154) (0.0510)</td>
<td></td>
</tr>
<tr>
<td>log(Tariff applied by US on the final good&lt;sub&gt;f,j,a,t−1&lt;/sub&gt;)</td>
<td>0.015</td>
<td>0.002</td>
<td>(0.0480) (0.0576)</td>
<td></td>
</tr>
<tr>
<td>Firm FE</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Year FE</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>N</td>
<td>1,150</td>
<td>1,323</td>
<td>878</td>
<td>645</td>
</tr>
<tr>
<td>R&lt;sup&gt;2&lt;/sup&gt;</td>
<td>0.186</td>
<td>0.206</td>
<td>0.215</td>
<td>0.254</td>
</tr>
</tbody>
</table>

The table reports the coefficients of OLS regressions. The dependent variable Reports<sub>f,j,a,t</sub>, is the number of reports filed by firm <i>f</i> producing good <i>j</i> in year <i>t−1</i> to lobby in support of the ratification of agreement <i>a</i>. The variable Tariff applied by FTA partners on final good<sub>f,j,a,t−1</sub> is the tariff applied by the partners of FTA agreement <i>a</i> on imports of good <i>j</i> from the US in year <i>t−1</i> (the year before firm <i>f</i> filed the lobbying report on agreement <i>a</i>). Tariff applied by US on inputs<sub>f,j,a,t−1</sub> is the tariff applied by the US on imports of the inputs necessary to make good <i>j</i> from partners of agreement <i>a</i> in year <i>t−1</i>. Tariff applied by US on final good<sub>f,j,a,t−1</sub> is the tariff applied by the US on imports of good <i>j</i> from partners of agreement <i>a</i> in year <i>t−1</i>. Standard errors in parenthesis clustered at the SIC1 level. Significance levels: *: 10%; **: 5%; ***: 1%.
Table A-8

Number of reports on FTAs, variation in the depth of the agreements

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depth DESTA (index)&lt;sub&gt;a&lt;/sub&gt;</td>
<td>0.024**</td>
<td>0.0083</td>
<td></td>
</tr>
<tr>
<td>Depth DESTA (latent)&lt;sub&gt;a&lt;/sub&gt;</td>
<td></td>
<td>0.622***</td>
<td>(0.1046)</td>
</tr>
<tr>
<td>Depth World Bank&lt;sub&gt;a&lt;/sub&gt;</td>
<td>0.021***</td>
<td>(0.0053)</td>
<td></td>
</tr>
</tbody>
</table>

Firm FE  Yes  Yes  Yes
Year FE  Yes  Yes  Yes
N        1,732 1,732 1,732
R<sup>2</sup>   0.198 0.202 0.205

The table reports the coefficients of OLS regressions. The dependent variable is the log of \( \text{Reports}_{f,a,t} \), the number of reports filed by firm \( f \) in year \( t \) to lobby in support of the ratification of agreement \( a \). \( \text{Depth DESTA (index)}_a \) and \( \text{Depth DESTA (latent)}_a \) measure the depth of agreement \( a \) as measured by Dür et al. (2014). \( \text{Depth World Bank}_a \) measures the depth of agreement \( a \) as measured by Hofmann et al. (2017). Standard errors in parenthesis clustered at the SIC1 level. Significance levels: *; 10%; **; 5%; ***; 1%.
Table A-9
Number of reports on FTAs, variation in the size of FTA partners

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>log(GDP of FTA partners(_{j,a,t-1}))</td>
<td>0.049***</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.0105)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>log(Export potential of FTA partners(_{j,a,t-1}))</td>
<td></td>
<td>0.041*</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.0175)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>log(Sourcing potential of FTA partners(_{j,a,t-1}))</td>
<td></td>
<td></td>
<td>0.012</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.0066)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>log(Competition from FTA partners(_{j,a,t-1}))</td>
<td></td>
<td></td>
<td></td>
<td>0.003</td>
</tr>
<tr>
<td></td>
<td>(0.0083)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Firm FE</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Year FE</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>N</td>
<td>1,821</td>
<td>1,294</td>
<td>1,327</td>
<td>863</td>
</tr>
<tr>
<td>R(^2)</td>
<td>0.176</td>
<td>0.186</td>
<td>0.201</td>
<td>0.215</td>
</tr>
</tbody>
</table>

The table reports the coefficients of OLS regressions. The dependent variable is the log of \(\text{Reports}_{f,j,a,t}\), the number of reports filed by firm \(f\) producing good \(j\) in year \(t\) to lobby in support of the ratification of agreement \(a\). \(\text{GDP of FTA partners}_{a,t-1}\) is the GDP of the partner(s) of agreement \(a\) in year \(t-1\) (the year before firm \(f\) filed the lobbying report on agreement \(a\)). \(\text{Export potential of FTA partners}_{j,a,t-1}\) is US exports of good \(j\) to the partner(s) of agreement \(a\) in year \(t-1\). \(\text{Sourcing potential of FTA partners}_{j,a,t-1}\) is US imports of the inputs of good \(j\) from the partner(s) of agreement \(a\) in year \(t-1\). \(\text{Competition from FTA partners}_{j,a,t-1}\) is US imports of good \(j\) from the partner(s) of agreement \(a\) in year \(t-1\). Standard errors in parenthesis clustered at the SIC1 level. Significance levels: *; 10%; **: 5%; ***: 1%.
Table A-10
Number of reports on FTAs, variation in the probability of a political bias against ratification

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Share of Democrats in Congress1_t</td>
<td>2.606***</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.7153)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Share of Democrats in Congress2_t</td>
<td>2.733***</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.7044)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Divided Government1_t</td>
<td></td>
<td>0.214***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.0539)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Divided Government2_t</td>
<td></td>
<td></td>
<td>0.303***</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(0.0576)</td>
<td></td>
</tr>
</tbody>
</table>

Firm FE       | Yes      | Yes      | Yes      | Yes      |
Year FE       | Yes      | Yes      | Yes      | Yes      |
N             | 1,821    | 1,821    | 1,821    | 1,821    |
R\^2          | 0.097    | 0.098    | 0.110    | 0.111    |

The table reports the coefficients of OLS regressions. The dependent variable is the log of Reports\_{f,a,t}, the number of reports filed by firm f in year t to lobby in support of the ratification of agreement a. Share of Democrats in Congress\_1\_t (Share of Democrats in Congress\_2\_t) measures the share of congressmen belonging to the Democratic party in year t (including independent congressmen who caucus with the Democrats). Divided Government\_1\_t (Divided Government\_2\_t) is a dummy variable equal to 1 if in year t one party controls the executive branch, while the other party controls at least one of the houses (both houses) of the legislative branch. Standard errors in parenthesis clustered at the SIC1 level. Significance levels: *: 10%; **: 5%; ***: 1%.
A 2 Theoretical Appendix

A 2.1 Mixed Market Structure

Our benchmark model features heterogeneous oligopolistic firms. In this section, we show that our main results continue to hold if we consider a mixed market structure, in which a few large (oligopolistic) firms coexist with a continuum of small (monopolistically competitive) firms.

This alternative market structure is characterized by the key features. First, oligopolistic firms have mass and can thus affect both market and policy outcomes, while monopolistically competitive firms have no mass and are thus inconsequential. As a result, only oligopolistic firms have incentives to select into lobbying. Second, the fringe of monopolistically competitive firms absorbs the negative impact of FTAs due to the increased competition in the domestic market. As a result, oligopolistic firms always gain from trade agreements (their domestic profits are unaffected and their foreign profits increase). In this setting, the endogenous set of lobbying firms will only contain winners from the FTA (i.e. \( \Omega_P \subset \Omega_L \)), even in the absence of fixed lobbying costs.

This alternative market structure can thus rationalize our main empirical findings that virtually all firms lobbying on FTA support their ratification (Fact 1). It can also rationalize our findings that lobbying firms are larger and more likely to involved in international trade than non-lobbying firms (Facts 2 and 3). Finally, using mixed market structure delivers the same predictions about the intensive margin of lobbying (Predictions P.1-P.3), for which we find strong empirical support in Section 6.

Closed Economy

As in our benchmark model, the economy involves an homogeneous good produced under constant returns to scale and perfect competition and multiple \( J \) sectors characterized by a mixed market structure. In what follows, we focus our analysis on one of these sectors.

There are \( N \) large firms with mass \( \omega_n \) and a continuum \( m \) of small firms, so that the (weighted) mass of varieties is \( |V_j| = \sum_{n=1}^{N} \omega_n + m \). We will interpret a large firm as a producer of a single-variety \( i \), which enters consumers’ utility with a mass point (as in Shimomura and Thisse, 2012).

Firms face a linear inverse demand:

\[
p_i = \alpha - \beta x_i - X
\]

where

\[
\int_V x_i di = \sum_{n=1}^{N} \omega_n x_n + \int_0^m x_i di.
\]

62 Since the endogenous determination of the product scope of a large firm is not of primary interest here, we consider large firms as single-product firms facing a demand with positive mass. Alternatively, we could interpret a large firm as a multi-product firm supplying a continuum of products of mass \( \omega_n \) (as in Parenti, 2018).

63 We can obtain the same results under alternative demand functions (see extensions to any additively separable preferences (including CES) in Parenti, 2018).
Large firms may differ in their marginal cost of production $c_n \leq c$ where $c$ is the marginal cost of production of small firms. Firms pay a fixed per-period production cost $F$ for their product. This cost is negligible for large firms (i.e., of mass zero in their overall cost) reflecting their economies of scope. Firms are assumed to be quantity-setters and compete in a Cournot-Nash fashion.

Large and small firms maximize their profits given respectively by

$$\Pi_n = (p_n - c_n)\omega_n x_n$$

and

$$\pi_i = (p_i - c)x_i - F$$

subject to (14).

The pricing rule of small firms is identical to the one in Melitz and Ottaviano (2008):

$$p_i - c = \frac{1}{2}(\alpha - X - c).$$

Large firms on the other hand internalize their impact on $X$ leading to

$$p_n - c_n = \frac{1}{2}(\alpha + Q_n - X - c_n) \quad \text{with} \quad Q_n = \omega_n x_n.$$

Note that if $c_n = c$ then a large firm would set a higher price, generating thereby more value-added per output. This is because large firms can afford to set higher markups since they have a non-negligible market share. More productive firms $c_n < c$ may set a lower price if their cost-advantage offsets their larger markup.

Total output of firm $n$ in is given by

$$Q_n = \frac{\omega_n(\alpha - c_n - X)}{2\beta + \omega_n},$$

while small firms’ scale is equal to

$$q_i = \frac{\alpha - c - X}{2\beta}.$$

Large firms make strictly positive profits $\Pi_n \equiv \left(\frac{\omega_n}{2\beta + \omega_n}\right)^2 (\alpha - c_n - X)^2$ while small firms’ equilibrium profits are driven down to zero by the free-entry condition:

$$\pi_m = (p_m - c)x_m - F = 0.$$ \hspace{1cm} (15)

Small firms thus act as a buffer: they adjust to competition through entry and exit, so that their profits are always equal to zero. Condition (15) determines the aggregate consumption in sector $j$:

$$X = \frac{\alpha - c - \sqrt{4\beta F}}{2}.$$ \hspace{1cm} (16)

**Open Economy**

Firms in one country can serve consumers in the other country, but face fixed cost $F_X$ and per-unit tariffs $\tau$ to export.

---

63 The results continue to hold if firms compete in prices rather than quantities. Under Bertrand competition, the value of total demand remains constant, since it is still pinned down by the free-entry condition of small firms of equation (15). Under linear demand, the game remains aggregative in firms’ strategic variables (i.e. prices).
The presence of these trade frictions generates selection into exporting. In particular, the fixed exporting costs $F_X$ imply that only large firms — for which these costs are negligible (i.e., mass zero in their overall cost) — find it profitable to export. Profits of a large firm of mass $\omega_n$ are then given by

$$\Pi_n = \left(\frac{\omega_n}{2\beta + \omega_n}\right)^2 \left( (\alpha - c_n - X)^2 + (\alpha - c_n - \tau - X)^2 \right).$$  \hfill (17)

A reduction in $\tau$ always benefits large firms, particularly firms with a larger mass (higher $\omega$) or a higher productivity (lower $c$):

$$\frac{\partial \Pi_n}{\partial \tau} = -2 \left(\frac{\omega_n}{2\beta + \omega_n}\right)^2 (\alpha - c_n - \tau - X).$$  \hfill (18)

Denoting by $\Delta \Pi_n$ the change in the overall profits of a large firm $n$ resulting from a FTA, we can see that larger and more productive firms benefit more from a given FTA ($\Delta \Pi_n$ increases in $\omega$ and decreases in $c$). Moreover, a given firm benefits more from a FTA the higher is the pre-agreement tariff ($\Delta \Pi_n$ increases in $\tau$) and the larger is the foreign market ($\Delta \Pi_n$ increases in $\alpha$).

Using a mixed market structure can thus provide a rationale for the empirical findings documented in Section 4. Large firms always benefit from trade agreements and thus always lobby in favor of FTA ratification. By contrast, small firms do not lobby, since their individual actions have no impact on policy outcomes.

A 2.2 Monopolistic Competition

In this section, we consider the case of a monopolistically competitive market structure featuring heterogeneous firms à la Melitz (2003). We make two additional assumptions: first, when they decide to enter, firms do not anticipate the trade agreements that will be negotiated in the future; second, the distribution of firm productivity has an unbounded right tail (e.g. Pareto, lognormal).

For all firms in the Home country, selling a variety domestically comes at a fixed cost $F_D$, while exporting it to Foreign requires a fixed cost $F_X$ and variable trade costs $\tau = (1 + t)$, which consist of an ad-valorem tariff $t$.

Consumers have quasi-linear CES preferences, with the lower tier given by

$$U(x) = \frac{\sigma}{\sigma - 1} \ln \left( \int_V x_i^{\frac{\sigma - 1}{\sigma}} di \right),$$

where $\sigma > 1$ is the elasticity of substitution. We assume that $F_X > F_D \tau^{1-\sigma}$, implying that only the most productive firms export, even in the absence of tariffs. We focus on the case in which the two countries are symmetric in terms of demand and distribution of firms, though the extension to asymmetric countries is straightforward under quasi-linear preferences. Each firm $n$ set its (f.o.b.) price

$$p_n = c_n / \rho \quad \text{where} \quad \rho = \frac{\sigma - 1}{\sigma}.$$
and its profits are given by

$$\Pi_n = \frac{1}{\sigma} \left( \frac{\rho \bar{P}}{c_n} \right)^{\sigma - 1} - F_D + \left( \frac{1}{\sigma} \left( \frac{\rho \bar{P}}{c_n \tau} \right)^{\sigma - 1} - F_X \right) 1_X(n),$$

where $\bar{P}$ denotes the price index at home and abroad $\bar{P} = (\int \bar{P}_t^{1-\sigma} dt)^{\frac{1}{1-\sigma}}$ and $1_X(n) = 1$ if firm $n$ decides to export.

The above equation defines cutoffs $c_D(\tau)$ and $c_X(\tau)$, which denote the marginal costs of the least productive domestic and exporting firms, respectively.

**The Impact of a Trade Agreement**

The intensity of competition is entirely captured by the price index $\bar{P}$, which is itself pinned down by the free-entry condition:

$$E[\Pi_n] = F_E.$$

By the envelope theorem, a decrease in $\tau$ unambiguously decreases the price index, leading to an increase in the intensity of competition in both markets.

A FTA leads to the elimination of tariffs, i.e. $\tau = 1$. Non-exporting firms unambiguously lose from the trade agreement, with the maximum loss incurred by the most productive domestic firm. In the standard case (in which $c_X$ is a decreasing function of $\tau$), this is identified by the cutoff $c_X(1)$, implying that the largest loss is incurred by the most productive domestic firm after the entry into force of the FTA:

$$\Delta \Pi_L \equiv \frac{F_D^2}{F_X} (1 + t)^{\sigma - 1} \left( 1 - \left( \frac{c_D(1 + t)}{c_D(1)} \right)^{\sigma - 1} \right) < 0.$$

As expected, the higher is the initial tariff $t$, the higher the loss.

By contrast, exporting firms always gain from the entry into force of a FTA. For these firms, the negative effect of the trade agreement resulting from the increase in competition in the domestic market is more than offset by the increased access to the foreign market. Formally, $\bar{P}^{\sigma - 1} (1 + \tau^{1-\sigma})$ is a decreasing function of $\tau$.

**The Political Game and Selection into Lobbying**

In the subsection above, we have shown that in a standard model of monopolistic competition more productive firms select into trade and gain from a FTA, while less productive firms serve only the

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65 To get closed-form solutions, one can assume that firm productivities are drawn from a Pareto distribution so

$$G(\varphi) = 1 - \left( \frac{\varphi_{\text{min}}}{\varphi} \right)^{-k},$$

where $\varphi_{\text{min}} > 0$ and $k \geq 1$.

66 Only firms that start exporting following the entry into force of the agreement may be hurt from its ratification, since they have to incur the fixed exporting costs (see Melitz and Redding 2014).
domestic market and lose from the agreement. Lobbying requires paying a fixed cost \( F_L \). Each firm chooses its lobbying expenditure \( l_f \) to maximize the following objective function:

\[
E[P(1, B)] \cdot E[P^*(1^*, B^*)] \cdot \Delta \Pi_f - \frac{l_f^2}{2} \cdot 1_{l_f > 0} \cdot F_L, \tag{20}
\]

where \( P \) and \( P^* \) are the probabilities that the FTA is ratified in the Home and Foreign country, which depend on firms’ lobbying expenditures and on the political bias in each country (see equation (5)). Risk neutral firms maximize the expected payoff from lobbying, taking into account the expected probability that the agreement enters into force.

Assuming a continuum of firms, as is standard models of monopolistic competition like Melitz (2003), implies that each individual firm has no impact on the probability that the agreement is ratified. Formally, the probability of Home ratification in the presence of a continuum of firms can be written as

\[
P(1, B) = \int_{\Omega_p} l_f df + B^+ \]

where \( \Omega_p \) and \( \Omega_a \) represent the mass of lobbying firms respectively in favor and against the agreement. In this setting, lobbying expenditures of individual firms are inconsequential.

To rationalize lobbying by individual firms, we could assume that the continuum is only an approximation and that firms do internalize their impact on the probability of ratification. Notice, however, that this assumption implies that firms are somewhat “schizophrenic”, i.e. they take into account their impact on political outcomes (the probability of FTA ratification), but do not internalize their impact on market outcomes (the price index). If instead they do internalize their impact on market and political outcomes, we are back to the pure oligopoly model considered in our benchmark model.

If we allow this schizophrenic behavior to retain the tractability of the standard Melitz model, we can rationalize the empirical finding that lobbying firms are always in favor of FTA ratification (Fact 1), if the fixed cost of lobbying are large enough. The following condition guarantees that that firm that lose from the FTA do not lobby is

\[
P'_1(\mathcal{L}) \approx \frac{B^-}{(\mathcal{L} + |B|)^2} > 0.
\]

Among the firms that gain from the agreement, it is clear from (20) that firms who benefit the most from the ratification are those who have the highest willingness to lobby. There is a perfect sorting of firms along their productivity (or equivalently, size or profits) into lobbying.

We can denote by \( c_L < c_X \) the marginal cost of production of the smallest firm that chooses to lobby. We need to prove that such a partition \([0, c_L]\) of firms into lobbying can be an equilibrium. Because the overall equilibrium contributions \( \mathcal{L} \) increase in the mass of firms who lobby (as shown

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\(^{67}\) Under the assumption of monopolistic competition, the proof is trivial. With a discrete number of firms: if a firm finds it profitable to lobby, then a firm which is more productive finds it also profitable to lobby as its contribution raises the profit of the incumbent. Because it is more productive, its return to lobbying is necessarily higher than the one of the incumbent and therefore above the fixed cost of lobbying.
in the baseline model), the expected probability that the FTA is ratified is an increasing function of the cutoff \( c_L \), while the expected gains for the cutoff firm \( c_L \) is decreasing. Since \( \mathbb{E}[P] \) is bounded between \( \mathbb{E} \left[ \frac{P^+}{B} \right] ; 1 \), and under the assumption that the right tail of the distribution of firm productivities is unbounded, the expected returns to lobbying can be arbitrarily large. Given that the payoff of the marginal firm is continuous in \( c_L \), the existence of an equilibrium is guaranteed.

To summarize, a monopolistically competitive market structure can only rationalize lobbying by individual firms on trade agreements if we are willing to treat firms differently in the market place and in the political arena. In the words of Neary (2016), we would need to assume that firms are “small in the small” (at the sectoral level), but “big in the big” (at the economy-wide level).

### A 2.3 Microfoundations of Contest Success Function

The probability that the FTA is ratified can be micro-founded using a discrete dichotomous choice model in which firms choose between two alternatives – lobbying in favor or against the ratification of a FTA. The outcome is not deterministic, however, because there is some noise associated to each side’s performance (Jia et al., 2013). The effectiveness of lobbying is captured below by \( \varepsilon^a \) and \( \varepsilon^p \) respectively (which are i.i.d. and follow a type 1 extreme value distribution). To this standard approach, we add that the government may be biased towards one group. This bias is not known by each group and is captured by a random variable \( B \). When the government has a positive bias \( B \), it is as if the overall contribution of the group in favor of the FTA was augmented by \( B \). On the contrary, when the bias is negative, it increases the contribution of the other group by \( B^- = -B > 0 \).

Overall, the probability that the FTA is ratified in one country conditional on the bias \( B \) is then given by

\[
P(\mathbf{l}, B) = \mathbb{P} \left( \ln \left( \sum_{\mathbf{l}_i} l_i + B^+ \right) + \varepsilon^p > \ln \left( \sum_{\mathbf{A}_i} l_i + B^- \right) + \varepsilon^a \right) \equiv \frac{\sum_{\Omega_\mathbf{l}} l_i + B^+}{\sum_{\Omega_\mathbf{l}} l_i + \sum_{\Omega_\mathbf{A}} l_i + |B|}.
\]

### A 2.4 Proof of Existence of Symmetric Equilibrium

We have shown that the total amount of contributions in the domestic country is given by

\[
P(B < 0) \mathbb{E}_{B < 0} \left[ \frac{-B}{\left( \sum_{\Omega_\mathbf{l}} \hat{l}_f - B \right)^2} \right] \cdot \mathbb{E} [P^*] \cdot \left( \sum_{\Omega_\mathbf{l}} \Delta \Pi_f \right) = \sum_{\Omega_\mathbf{l}} \hat{l}_f.
\]

By symmetry, the overall amount of contributions in the Foreign country can be expressed as

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68 The expected return to lobbying depends on the functional form of the distribution of the bias \( B \) and needs not be monotonic in the cutoff (i.e. there might be more than one equilibrium partition of firms).

69 Bernard, Redding and Schott (2011) consider a model of monopolistic competition with large multi-product firms, which supply a continuum of products. There is, however, a continuum of such firms, so their individual actions would still have no impact on political outcomes.
A first remark is that \((0, \hat{L}^*)\) or \((\hat{L}, 0)\) cannot be equilibria so if an equilibrium exists, it features a strictly positive amount of overall contributions in both countries, i.e. \((L, L^*)\) are strictly positive. Second, from these two equations it can be seen that the aggregate best-responses are strategic complements: the larger the overall contributions abroad, the larger the domestic contributions will be overall.

The assumption of symmetric countries with the same distribution of the bias implies that
\[
\mathbb{P}(B < 0) = \mathbb{P}(B^* < 0) \quad \text{and} \quad \mathbb{E}_{B < 0} \left[ \frac{\hat{\mathcal{L}}}{\hat{\mathcal{L}} - B} \right] = \mathbb{E}_{B^* < 0} \left[ \frac{\hat{\mathcal{L}}}{\hat{\mathcal{L}} - B^*} \right].
\]
We can then prove that a symmetric equilibrium exist. Setting \(\hat{\mathcal{L}} = \hat{L}^*\) in the above equations leads to
\[
\mathbb{P}(B < 0) \mathbb{E}_{B < 0} \left[ \frac{-B}{\hat{\mathcal{L}} - B} \right] \left( \mathbb{P}(B < 0) \mathbb{E}_{B < 0} \left[ \frac{\hat{\mathcal{L}}}{\hat{\mathcal{L}} - B} \right] + \mathbb{P}(B \geq 0) \right) \left( \sum_{\Omega_p} \Delta \Pi_f \right) = \hat{\mathcal{L}}.
\]

The left hand side is a function of \(\hat{\mathcal{L}}\) that takes on a strictly positive value in 0, is continuous, positive on \(\mathbb{R}_+\) and converges to zero asymptotically. It must intersect at least once the right hand side, which proves the existence of a symmetric equilibrium.

### A 2.5 Complementarity between Returns to Lobbying and Gains from the FTA

For simplicity, we set \(\alpha_f = \Delta \Pi_f \mathbb{E}[P^*(\mathcal{L}, B^*)]\) and \(f(\mathcal{L}) = \mathbb{P}(B < 0) \mathbb{E}_{B < 0} [P(\mathcal{L}, B)]\). At equilibrium, each firm’s lobbying expenditure is given by \(\hat{l}_f = \alpha_f f'(\hat{\mathcal{L}})\) so that the net return to lobbying for firm \(i\) is given by \(\alpha_f \left( f(\hat{\mathcal{L}}) + \mathbb{P}(B > 0) \right) - \frac{\alpha^2 f'(\hat{\mathcal{L}})^2}{2}\).

This is increasing between \([0, \alpha^*]\) where \(\alpha^* = \left( f(\hat{\mathcal{L}}) + \mathbb{P}(B > 0) \right) / f'(\hat{\mathcal{L}})^2\). Comparing firms \(f\) and \(f'\) such that \(\alpha_f < \alpha_{f'} \leq \alpha^*\), it is then clear that firm \(f'\) net return to lobbying at equilibrium is larger, since its gain from the FTA \(\Delta \Pi_f\) is higher.

To conclude the argument, we simply need to show that \(\alpha_f \leq \alpha^* \quad \forall f \in \Omega_f\). Now, because \(f(\mathcal{L})\)
is increasing, and concave with \( f(0) = 0 \), we have
\[
f(\hat{L}) > \hat{L}f'(\hat{L}).
\]
Combining this inequality with the first-order condition for a lobbying firm \( f \), i.e. \( \alpha_f f'(\hat{L}) = \hat{i}_f < \hat{L} \), ends the proof.

A 2.6 Shifts in the Distribution of the Political Bias

A distributional shift that leaves unchanged the distribution of the political bias when it’s negative can be achieved through various means, but for simplicity, it may be useful to think of right truncations at strictly positive values on the distribution of \( B \). Specifically, if the support of \( B \) is \((\hat{b}, \tilde{b})\), the new political bias is described by \( \tilde{B} \) which is a truncation of \( B \) defined on \((\hat{b}, \tilde{b})\) where \( \tilde{b} < \hat{b} \). By construction, the conditional expected probabilities that the FTA is ratified are the same whether the political bias is \( B \) or \( \tilde{B} \). Indeed, conditional on \( \tilde{B} > 0 \), the expected probability of ratification remains equal to 1. Conditional upon \( \tilde{B} < 0 \), the expected probability of ratification remains equal to \( \mathbb{E}_{B<0} \left[ \frac{L}{\mathbb{E}-B} \right] \equiv \mathbb{E}_{\tilde{B}<0} \left[ \frac{L}{\mathbb{E}-\tilde{B}} \right] \forall L > 0 \). Consequently, only the probability that the bias is positive (or negative) impacts the expected probability of ratification for a given \( L \).