Globalization for Sale*

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Abstract

We study the role of firms in the political economy of free trade agreements (FTAs). Using detailed information from lobbying reports filed under the Lobbying Disclosure Act, we show that virtually all firms that lobby on FTAs support their ratification. Relative to non-lobbying firms, lobbying firms are larger, more likely to be engaged in international trade and to operate in comparative advantage sectors. To rationalize these findings, we develop a model of endogenous lobbying on trade agreements by heterogeneous firms. We show that the distributional effects of an FTA are asymmetric: the winners have higher stakes in the agreement than the losers, which explains why only pro-FTA firms select into lobbying. The model also delivers predictions on the intensive margin of lobbying. In line with these predictions, we find that larger firms spend more on a given FTA and individual firms spend more supporting the ratification of agreements that generate larger potential gains and that are more likely to be opposed by politicians.

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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, most of which take the form of free trade agreements (FTAs).[1] 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). Multilateral rules require members of regional trade agreements to reciprocally eliminate "duties and other restrictive regulations of commerce" on "substantially all the trade" between them.

According to Rodrik (2018), the political economy of trade agreements is "shaped largely by rent-seeking, self-interested behavior on the export side. Rather than rein in protectionists, [trade agreements] empower another set of special interests and politically well-connected firms, such as international banks, pharmaceutical companies, and multinational corporations."

Rodrik's argument may seem in contrast with the standard view that trade liberalization efforts are met by staunch opposition.[2] This view, however, is focused on unilateral and sector-specific trade policies, implying that trade liberalization can only hurt firms. By contrast, FTAs are reciprocal and cover multiple sectors, and can thus benefit large firms that select into trade, allowing them to improve their access to foreign consumers and to reduce the cost of sourcing inputs from foreign suppliers.[3] Small domestic firms, on the other hand, lose from FTAs, since they suffer from the increase in import competition in the domestic market and do not benefit from improved access to foreign consumers and suppliers. A trade agreement like KORUS may thus benefit large footwear and apparel companies like Nike, but hurt small firms in the same sector.

The contribution of this paper is threefold. First, we build a unique dataset on firm-level lobbying expenditures on FTAs. Second, we provide systematic evidence that the politics of trade agreements is dominated by large pro-FTA firms, in line with Rodrik's argument. Finally, we develop a new model of endogenous lobbying on FTAs by heterogeneous firms, which can explain the observed variation on the extensive and intensive margin of firm-level lobbying on trade agreements.

Following recent studies (e.g. Bombardini and Trebbi, 2012; Blanes i Vidal *et al.*, 2012; Bertrand *et al.*, 2014; Mayda *et al.*, 2018), we use detailed information from lobbying reports available under the Lobbying Disclosure Act of 1995, which allows to identify the issues targeted by lobbyists. Our main dataset is based on all reports that explicitly mention the bills for the ratification of FTAs in Congress. This methodology allows us to focus on the final version of a trade agreement,

[1] In the GATT/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 June 1 2020, 303 RTAs were in force. These correspond to 490 notifications from WTO members (WTO Secretariat).

[2] This view, elegantly captured by the protection for sale model of Grossman and Helpman (1994), is supported by several studies (e.g. Goldberg and Maggi, 1999; Gawande and Bandyopadhyay, 2000; Bombardini, 2008).

[3] The literature on firm heterogeneity in trade emphasizes that only the most productive firms in a sector select into exporting (e.g. Bernard and Jensen, 1999; Melitz, 2003), foreign direct investment (e.g. Helpman *et al.*, 2004) and global sourcing (e.g. Antràs *et al.*, 2017).

and examine whether firms lobby in favor of or against its implementation.[4] As an alternative methodology, we use keywords rather than bill numbers to track all lobbying reports related to trade agreements. This allows us to capture lobbying activities that took place during the negotiations of FTAs and to include lobbying reports on the Trans-Pacific Partnership (TPP), which never reached the ratification stage.[5] In our analysis, we focus on lobbying by firms, which play the dominant role in lobbying on trade agreements.[6] We collect information on the identity of each lobbying firm, its lobbying expenditure on a particular FTA, and whether it supported or opposed the agreement.

Using this dataset, we uncover new facts about firm-level lobbying on trade agreements.[7] A common presumption in the literature is that trade agreements can foster greater liberalization than unilateral trade policies, because they mobilize export interest against import-competing interests. The idea is that "reciprocal liberalization mobilizes a country's exporters to lobby for greater domestic trade liberalization, since it is the avenue through which they gain better access to foreign markets. A counterweight to the import-competing sector is thereby created, diminishing the political heft of these domestic producers" (WTO, 2007, p. 129). Against this presumption, we find that lobbying on trade agreements is a rare event,[8] and is dominated by pro-FTA firms, with no counterweight by anti-FTA firms: in over 99% of the cases, lobbying firms support the ratification of trade agreements. We then match our lobbying dataset with Compustat and find that firms that lobby on FTAs are larger, more likely to be engaged in international trade and to operate in comparative advantage sectors, relative to non-lobbying firms. Overall, our data show that a few global firms play an outsized role in trade politics, in line with Rodrik's argument and with the findings of some studies by political scientists.[9]

These facts cannot be explained by the existing models on the political economy of FTAs, in which lobbying is done by industry groups (Grossman and Helpman, 1995; Maggi and Ossa, 2020) or by homogeneous firms (Krishna, 1998; Ornelas, 2005) and the decision to lobby is exogenous.

[4] All the trade agreements in our sample have been negotiated under Fast Track Authority. As a result, US congressmen cannot amend them, but can only vote up or down on their ratification (see Conconi *et al.*, 2012).

[5] TPP was signed by President Obama in February 2016, but never reached the Congress floor, since President Trump withdrew from the agreement on his first day in office.

[6] Total lobbying expenditures on FTAs by manufacturing firms is more than 10 times larger than spending by industry groups and 58 times larger than spending by unions (see Figure A-2).

[7] A large share of firms' lobbying expenditures on trade policy is related to trade agreements. For example, in 2016 firms spent $1,036.95 millions lobbying on trade, of which $730.96 millions (i.e. 70.49%) were related to TPP.

[8] 114 firms lobby on FTAs and specifically mention ratification bill numbers. This result echos previous studies that examine lobbying on other policy issues. For example, Kerr *et al.* (2014) document that only 327 firms lobbied on immigration policy in 1996-2008. Huneeus and Kim (2018) find that, among of all public firms operating in the United States in 2017, only 766 firms engaged in lobbying across all policy issues.

[9] Using data on attitudes towards US trade agreements, Osgood (2017) documents that "America's business community has (almost) uniformly supported trade liberalization." He finds that, among both exporting and import-competing industries, the public position is "overwhelmingly likely to be *support*, not opposition." Using data from lobbying reports related to trade policy in general, Kim (2017) shows that more productive exporting firms are more likely to lobby to reduce tariffs, especially when their products are differentiated. Osgood (2020) examines public support for trade and globalization among US firms over the last three decades, focusing on the way firms organize collectively rather than individually. He documents that efforts by pro-trade firms to support trade liberalization "vastly outstrip those of trade's corporate opponents."

To explain why the politics of FTAs is dominated by a few large firms, we need a model of endogenous lobbying by heterogeneous firms. Moreover, in previous models, lobbying takes the form of campaign contributions that are paid ex-post, i.e. after incumbent politicians decide whether or not to ratify the agreement. We need instead a model to explain lobbying expenditures that are paid ex-ante, i.e. before the ratification of the FTA.

We thus develop a new model of the political economy of trade agreements, in which heterogeneous firms choose whether to be politically organized and how much to spend in favor of or against the ratification of a proposed FTA. To focus on the role of firm heterogeneity, we consider a simple two-country setting.[10] The economic structure of the model allows us to study the distributional effects of the trade agreement, which leads to the reciprocal elimination of tariffs across all sectors.[11]

We first consider the effects of the trade agreement in the canonical model of firm heterogeneity under monopolistic competition (Melitz, 2003). The entry into force of an FTA creates winners and losers. Non-exporting firms lose, since they suffer from the increase in competition in the domestic market and do not benefit from improved access to the foreign market. By contrast, exporting firms gain, with the most productive "superstar" exporters being the largest winners. Crucially, these firms have higher stakes in the agreement than the biggest losers: their gains are larger in absolute terms than the maximum losses incurred by non-exporting firms.

In the canonical model of monopolistic competition, individual firms have no mass and are thus inconsequential, i.e. have no impact on market and policy outcomes. To be able to affect aggregate policy outcomes like FTA ratification, firms must be large not only at the sectoral level ("big in the small", in the words of Neary, 2016), but also in the economy as a whole ("big in the big"). We show that the key insights of Melitz (2003) about the distributional effects of an FTA can be extended to models with heterogeneous oligopolistic firms, if the presence of a competitive fringe or comparative advantage shelter large exporting firms from losses in their domestic market.

The political structure of the model builds on the literature on lobbying/rent-seeking in contests (e.g. Tullock, 1980; Becker, 1983; Dixit, 1987; Esteban and Ray, 2001; Siegel, 2009 and 2010). Using the contest success function approach allows us to model in a tractable way lobbying efforts made by firms ex-ante, i.e. before the ratification of the trade agreement.[12] Firms choose whether to be

[10] Most of the studies that abstract from firm heterogeneity use a three-country setting to examine whether the political feasibility of the agreement depends on the identity of the FTA partner. Taking as given the external tariffs of FTA members, Grossman and Helpman (1995) and Krishna (1998) argue that governments are more likely to form FTAs when they reduce national welfare, as a result of rent-creating trade diversion. Ornelas (2005) shows that the opposite may be true if external tariffs are endogenous: the prospect of rent destruction can critically undermine (and in some cases rule out entirely) the political feasibility of welfare-reducing FTAs, so politically viable FTAs tend to be overall welfare enhancing. In our theoretical model, we take the identity of the FTA partner as given. In our empirical analysis, we account for differences across US FTA partners.

[11] In line with GATT Article XXIV, FTAs lead to the elimination of all tariffs between member countries. As shown by Kohl *et al.* (2020), very few products are excluded. For example, the US did not exclude any HS8 good from the NAFTA agreement. The highest percentage of products excluded by the US is 1.73 (in the FTA with Australia).

[12] In a related paper, Cole *et al.* (2018) model a trade agreement between two countries as a "parallel" contest

politically organized and how much to lobby in favor of or against a proposed FTA, anticipating the impact of their lobbying expenditures on the probability of ratification. Crucially, politicians deciding on the ratification of the FTA may be biased in favor of or against it, and there is some uncertainty about this political bias.[13] This novel feature of our model rules out trivial Nash equilibria, in which firms in both countries would choose not to lobby, and is key to explaining firm selection into lobbying.

We show that the biggest winners have higher stakes in the agreement than the biggest losers. When the difference in the stakes is large enough, only pro-FTA have incentives to be politically organized and there is a unique equilibrium in which only the largest exporting firms select into lobbying. This equilibrium features free riding on the extensive margin: non-organized pro-FTA firms benefit from the efforts of lobbying firms.

The model provides a simple rationale for our key empirical finding that virtually all lobbying firms are in favor of trade agreements. It is also consistent with the other facts that emerge from our dataset. In particular, it can explain why lobbying firms are larger, more likely to be engaged in international trade and to operate in comparative advantage sectors than non-lobbying firms.

We next derive testable predictions about the intensive margin of lobbying on FTAs. 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. In line with the second prediction, we show that individual firms spend more supporting FTAs when their potential gains from the agreement are larger. 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 paper builds 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. In this literature, the paper that is closest to ours is Bombardini (2008), who introduces heterogeneous firms in the protection for sale model model of Grossman and Helpman (1994). Our analysis differs from

between exogenously given pro- and anti-trade groups. We develop instead a model of endogenous lobbying by heterogeneous firms, which can explain why the politics of trade agreements is dominated by large pro-FTA firms.

[13]This bias captures the political uncertainty faced by lobbying firms: when deciding whether and how much to spend lobbying on FTAs, firms may not know whether there is a majority in favor in both houses of Congress, which is required for the agreement to be ratified. Indeed, even 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, 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).

hers along several dimensions. From a theoretical perspective, the key difference is that we study lobbying on FTAs – which are reciprocal and cover all sectors – while she considers lobbying on a unilateral and sector-specific tariff.[14] Moreover, her model features one sector with price-taking firms that are heterogeneous in size (due to differences in their endowment of a specific factor); there is no selection into exporting and no distributional effects of trade policy: all firms gain from an increase in the sectoral tariff. By contrast, our model features selection into exporting, and distributional effects of trade policy: the entry into force of an FTA generates winners and losers within and across sectors. When the difference in the stakes of the winners and losers is large enough, only pro-FTA firms lobby. The equilibrium selection of pro-FTA firms into lobbying is unique: only the biggest winners lobby in favor of the FTA. In terms of data, we exploit detailed information from lobbying reports available under the Lobbying Disclosure Act, which makes it possible to trace the specific policy issues targeted by lobbyists. By contrast, Bombardini (2008) uses data on PAC campaign contributions, which do not allow to identify the policy issues that lobbyists are trying to influence. Finally, her empirical analysis is at the industry level (explaining cross-industry variation in the level of protection), while ours is at the firm level (explaining within- and cross-firm variation in lobbying expenditures on trade agreements).

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

2 Data

2.1 Lobbying Dataset

We construct a novel dataset on firm-level lobbying expenditures on trade agreements. This is constructed using detailed information from lobbying reports available under the Lobbying Disclosure Act (LDA), which was introduced in 1995. The LDA requires individuals and organizations engaged in lobbying to register with the federal government.[15] Lobbying activities encompass all efforts to influence the thinking of legislators or other covered federal officials for or against a specific cause. As stated in the Act, they include lobbying contacts and efforts in support of such

[14] Our studies have focused on sector-specific trade policies. Bombardini and Trebbi (2012) show that in sectors characterized by a higher degree of competition firms tend to lobby through an industry association, while in more competitive sectors they are more likely to lobby individually. Mayda *et al.* (2018) examine lobbying by firms to influence Congressional decisions to suspend tariffs on intermediate goods.

[15] There is a very low minimum threshold to register as a lobby. For example, lobbying firms 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 represents 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."

contacts, preparation and planning activities, research, and other background work.

The LDA requires individuals and organizations to file semi-annual reports providing information on their lobbying activities at the federal level. All lobbying expenditures must be disclosed, no matter how small.[16] The legislation imposes significant civil and criminal penalties for violations of its requirements. Lobbying disclosure reports can be found on the website of 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.

As mentioned in the previous section, data on lobbying reports have been used in recent studies on lobbying. Using this data has two key advantages compared to the data on campaign contributions that were used in earlier empirical studies on the political economy of trade policy (e.g. Goldberg and Maggi, 1999; Gawande and Bandyopadhyay, 2000; Bombardini, 2008). First, data on lobbying expenditures allow us to directly trace the issues targeted by lobbyists, which is not possible for data on contributions. This is because the LDA requires to disclose not only the amounts of lobbying expenditures, but also the issues for which the lobbying is carried out.[17] 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. Following earlier studies focused on other policies (e.g. Kang, 2016; Mayda *et al.*, 2018), we use bill numbers to track reports related to the FTAs.[18] Our main sample is based on all reports filed by firms that explicitly mention the FTA ratification bills in the House and Senate in Section 16 of the report. This allows us to focus on the final version of a trade agreement, and examine whether firms lobby in favor of or against its implementation. In robustness checks, we use keywords rather than bill numbers to identify lobbying expenditures related to FTAs.

Although our analysis is focused on lobbying by individual firms, we have collected all lobbying reports related to FTA ratification bills, including those filed by industry associations and trade unions. As shown in Figure A-2, lobbying on trade agreements is dominated by individual firms.

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).[19]

[16] When lobbying expenditures are below $5,000 during one quarter, the lobbying organization has still to file the report (specifying the general and specific issues it lobbied on), but does not have to write down the exact amount. In our lobbying dataset, there are a few firms/lobbying firms reporting lobbying expenditures below $5,000.

[17] 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).

[18] See Table A-1 in the Empirical Appendix for a list of all the FTAs that have been ratified during our sample period and the corresponding bill numbers.

[19] 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

To study the extensive margin of lobbying on FTAs, we define the dummy variable *Lobbying on* $FTA_{f,j,a,t}$, which is equal to 1 if firm f producing good j lobbies on the ratification of agreement a in year t. As explained below, we also code the direction of lobbying, i.e. whether the firm is in favor or against ratification, using information from lobbying reports and official company statements.

To study the intensive margin, we define the variable *Lobbying Expenditure*$_{f,j,a,t}$ is then equal to the total amount (in US dollars) that firm f, producing good j, spends on the ratification of agreement a in year t. 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 related. 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 standard procedure in the literature (e.g. Facchini *et al.*, 2011; Mayda *et al.*, 2018) to define the share of expenditures associated with the FTA ratification.[20] Individual firms tend to file multiple reports on the same FTA, so we sum up the amounts each firm spent in a given year lobbying on a particular agreement. We also construct an alternative measure of the intensive margin of lobbying: *Number of Reports*$_{f,j,a,t}$ is the number of lobbying reports filed by the firm in year t that mention agreement a. This variable does not suffer from the measurement error that can arise when allocating lobbying expenditures across different issues.

Our main lobbying database contains 803 reports filed by 112 firms related to the 12 FTAs ratified by the United States after the passage of the Lobbying Disclosure Act. We collapse the data at the firm-FTA-year level. Table A-2 provides some descriptive statistics at the firm-FTA level on the lobbying expenditures, the number of reports filed, and the mode of lobbying. On average, individual firms spent $290,555 on the ratification of an 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, they use a lobbying firm (22.99%) or combine the two lobbying modes (6.57%).

To determine the position of the lobbying firm, we manually code whether it supported or opposed the ratification of the trade agreement. In around 30% of the cases, the firm's position is

the firm as income in Section 1-2. Direct lobbying is the prevalent mode (see Table A-2): 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.

[20] 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 by the number of times the ratification of the FTA was mentioned as a specific issue. For example, if a firm lobbied on four general issues, and the ratification of an 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.

clearly stated in Section 16 of the lobbying report. Examples of expressions indicating support for the ratification of an agreement are: *support, sought passage, advocate for swift passage, passage of bill in its entirety, provisions promoting the passage, enactment of entire bill, promotion of entire agreement, urged passage.*[21] When the information on the firm's position is not clearly expressed in the report, or is missing, the coding of the firm's position is based on official company statements (e.g. company websites, public statements) around the time of the FTA ratification.

Figures A-3- A-6 in the Empirical Appendix provide four examples of lobbying reports in which Section 16 provides information about the firm's position. The first was filed by Miller Brewing Company in the second semester of 2005.[22] The company spent around $375,000 lobbying to "*Support* S.1307 (to Implement the Dominican Republic-Central America-U.S. Free Trade Agreement Implementation Act); *Support* H.R. 3045 (to Implement the Dominican Republic-Central America-U.S. Free Trade Agreement Implementation Act)." The second example is a report filed by Philip Morris in the third quarter of 2008. The company spent $1,020,000 lobbying on "HR 5724/S2830 – United States-Columbia Trade Agreement Implementation Act; To implement the United States-Columbia Trade Promotion Agreement; *enactment of the entire bill.*" The last two reports were filed in the third quarter of 2011 in support of KORUS. The third report is an example of indirect lobbying, since it was filed by a lobbying company: the Laurin Backer Group reports receiving $20,000 from Masco Corporation to lobby "*in support* of the Korea-US Free Trade Agreement (HR 3080/D1642)." The last report was filed by US Steel Corporation, which spent $800,000 lobbying on "*Implementation and enforcement* of U.S. trade laws," including "H.R. 3080 – United States Korea Free Trade Agreement, *entire bill.*"

As mentioned above, when the report does contain explicit information about the firm's position, we use official company statements to code whether the firm supported or opposed the agreement. For example, in a report filed in the third quarter of 2011, Applied Materials Inc. declares spending $250,000 lobbying on "US-Korea Free Trade Agreement (HR 3080)." On the day of the ratification of the FTA, the company released a statement applauding the US Congress for the result of the vote: "After more than four years of convoluted negotiations (both bilaterally and domestically), Congress today *finally approved* the legislation necessary to ratify and implement the Korea-U.S. Free Trade Agreement (KORUS FTA). This *long overdue* action is an important step in U.S. trade policy, and will help *open new opportunities and new markets.* [...] Applied Materials has *long championed passage* of the KORUS FTA, and has worked side-by-side with the U.S.-Korea Business Council and the U.S.-Korea FTA Business Coalition to *push for passage and implementation* of what is the most significant trade agreement since the North American Free Trade Agreement (NAFTA). [...] Applied Materials *applauds* Congress for taking this important step to open up new markets in

[21] In reports filed by firms, we never found wording that clearly express opposition, which were instead regularly used in reports filed by labor unions (e.g. *lobbied in opposition*, *oppose*, *against*).

[22] Notice that this is an example of an early lobbying report filed on a semi-annual basis is a non-digitalized format. As mentioned before, starting from 2008 lobbying reports are filed electronically at the quarterly level.

South Korea, while assisting U.S. workers who might be displaced. This truly is a win-win and we look forward to speedy passage in Korea's National Assembly."[23] We can code the firm's position on the FTA, based on information from the reports or official company statements, in all but two cases. We exclude these cases from our analysis.

Our main dataset is based on lobbying reports that explicitly mention FTA ratification bills. This allows us to focus on the final version of a trade agreement, and examine whether firms lobby in favor of or against its implementation. As a robustness check, we use keywords rather than bill numbers to track lobbying reports related to a particular trade agreement. This methodology allows us to consider lobbying expenditures on the Trans-Pacific Partnership Agreement. This FTA was signed by President Obama in February 2016, but did not reach the ratification stage (President Trump withdrew from the agreement on his first day in office). Figure A-7 in the Empirical Appendix provides an example of a lobbying report filed related to TPP: in the first quarter of 2016, Qualcomm, Inc. declares spending $1,730,000 lobbying on "*support* for Trans Pacific Partnership."

Using keywords also allows us to consider lobbying reports filed during the negotiations of an FTA. Focusing on the Korea-United States FTA, the most important trade agreement ratified since the passage of the Lobbying Disclosure Act in 1995, 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-8 in the Empirical Appendix).

2.2 Matched Dataset

To be able to compare firms that lobby on trade agreements with 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.[24] The matched dataset contains 114,412 firm-FTA-year observations, covering the period 2001-2012.

2.3 Firm Controls

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

[23] See `http://blog.appliedmaterials.com/congress-approves-korea-free-trade-agreement`. All official company statements used to code the position of lobbying firms are available from the authors upon request.

[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.

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.[26] 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.[27] 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 and/or importer*$_{f,t}$, which is equal to 1 if firm f is an exporter or an importer in year t.

The Fundamentals segment of Compustat 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*$_j$, which is equal to 1 if sector j (the main activity of firm f) is classified as tradable by Mian and Sufi (2014).[28]

Table A-3 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,

[26] Non-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.

[27] We thank Nitish Jain for providing us with the data to construct this variable.

[28] They provide two independent methods of industry classification which serve as a cross-check on each other. The first classification scheme is based on industry-level trade data for the U.S. and it defines industries to be 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.

versus 2.7 $US billions and 8,500 employees for non-lobbying firms. The variable *Exporter and/or Importer*$_{f,t}$ is equal to 1 for most firms in the sample for which it can be defined, with the propensity to trade being higher for lobbying than non-lobbying firms (99% instead of 78%). Lobbying firms are also more likely to operate in tradable sectors (the mean of the variable *Tradable sector*$_j$ is 0.678 for lobbying firms, and 0.406 for non-lobbying firms).

2.4 FTA Controls

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. All these variables are constructed using data for the year of the ratification of the FTA, with the exception of the variables about the depth of the agreement, which are time invariant.[29] Descriptive statistics of the FTA variables are reported in Table A-4 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 WITS database. We use the Effectively Applied Tariff, which is defined as the lowest available tariff, i.e. Most Favored Nation (MFN) or preferential.[30]

> *Tariff applied by FTA partners on the final good*$_{j,a}$: this is the tariff faced by firms producing good j when exporting to the FTA partners, before the ratification of agreement a.
>
> *Tariff applied by US on inputs*$_{j,a}$: this is the tariff faced by firms producing 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 producing good j, we focus on its top 100 inputs i as ranked by the the direct requirement coefficients IO_{ij} 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_{ij} coefficients as weights.

[29] Using the data of the ratification allows us to capture economic and political conditions before the entry into force of the agreement. The results are robust to constructing the FTA variables using different pre-agreement years.

[30] 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%.

[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 from 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.

Tariff applied by US on the final good$_{j,a}$: this 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 use the data defined at the SIC4 level. 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.[33] For this reason, we define the tariff variable as the maximum SIC4 tariff applied by the US/the FTA partners. The results are robust to controlling for other moments and using average tariffs. The descriptive statistics in Table A-4 show that the United States tends to apply lower tariffs before the agreement than its FTA partners,[34] and that input tariffs tend to be lower than tariffs on final goods.[35]

To capture variation in the size of FTAs partners, we use the variable *GDP of FTA partner*$_a$, which is the GDP of the partner(s) in the year of the ratification of agreement a. This is constructed using data from the World Bank and is expressed in constant 2010 US millions of dollars.

By combining information on the pre-agreement tariffs and the size of the FTA partner, we can measure the impact of a trade agreement on a firm's gains in terms of improved access to consumers and suppliers in the foreign market and its losses due to increased competition in the domestic market. For a firm producing good j these are given by:

Improved access to foreign consumers$_{j,a}$ is the multiplication between the variables *Tariff applied by FTA partners on the final good*$_{j,a}$ and *GDP of FTA partner*$_a$.

Improved access to foreign suppliers$_{j,a}$ is the multiplication between the variables *Tariff applied by US on inputs*$_{j,a}$ and *GDP of FTA partner*$_a$.

Increased competition in the domestic market$_{j,a}$ is the multiplication between the variables *Tariff applied by US on the final good*$_{j,a}$ and *GDP of FTA partner*$_a$.

The variable $RCA_{j,a}$ measures the extent to which the United States has a revealed comparative advantage in sector j relative to the FTA partner(s) of agreement a. The RCA index, also known

[33] Another limitation is that tariff data are often missing, so we lose many observations when including the tariff variables in our regressions.

[34] There are two reasons for this: (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.

[35] The variable *Tariff applied by US on inputs*$_{j,a}$ has a much lower mean (0.145) and maximum (3.94) than *Tariff applied by US on the final good*$_{j,a}$. 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 (0.038 on average in our sample). If we construct the variable *Tariff applied by US on inputs*$_{j,a}$ as a simple (unweighted) average of input tariffs, the mean is 3.31 (which is very similar to the mean of *Tariff applied by US on the final good*$_{j,a}$).

as Balassa index, is computed as the ratio between two shares: a country's exports of a particular good j over its total exports; and the corresponding share for the rest of the world (or a reference country). The source of the export data is the World Integrated Trade Solution (WITS) database. We download the data at the SIC4 level, which allows us to directly match it with the industry codes of firms in our lobbying dataset. The variable $RCA_{j,a}$ is constructed as the ratio between the Balassa index of the US and that of the FTA partner(s) of agreement a. The US has thus a revealed comparative advantage (disadvantage) in sector j relative to the FTA partner(s) of agreement a if $RCA_{j,a} > 1$ ($RCA_{j,a} < 1$). As shown in the descriptive statistics of Table A-4, lobbying firms tend to operate in sectors in which the US has a large comparative advantage (the mean of $RCA_{j,a}$ is 1472.893). Given that the distribution of $RCA_{j,a}$ is highly skewed, we take the log of this variable in the regressions.

As pointed out by Baldwin (2011) and Antràs and Staiger (2012), firms can gain from trade agreements not only through the elimination of tariffs, but also through provisions that reduce non-trade barriers and help to protect their tangible and intangible assets in foreign markets. To measure the extent to which FTAs go beyond the elimination of tariff barriers, we use the following variables:

> *Depth DESTA*$_a$: this measure from Dür *et al.* (2014) relies on latent trait analysis of 48 variables to capture the extent to which an agreement goes beyond simple tariff reductions.
>
> *Depth World Bank*$_a$: this measure from Hofmann *et al.* (2019) codifies provisions related to 52 policy areas in trade agreements and their legal enforceability.

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$_a$ is the share of members of the legislative branch belonging to the Democratic party in the year of the ratification of agreement a. We construct two versions of this variable. The first includes only congressmen who are members of the Democratic party, the second also includes independent congressmen who caucus with the Democrats.

Divided Government$_a$ is a dummy variable equal to 1 if the legislative and executive branches are not politically aligned in the year of ratification of agreement a. 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.

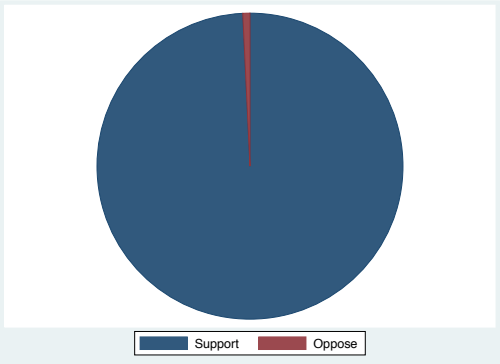
3 Stylized Facts

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:

Fact 1. *Virtually all lobbying firms are in favor of FTAs.*

This fact holds across all FTAs that have been negotiated by the United States since the Lobbying Disclosure Act was passed in 1995. As discussed below, we find overwhelming support among lobbying firms for: agreements negotiated with small partners (e.g. Panama or Colombia) and with larger partners (e.g. Australia and Korea); all agreements that have been ratified, as well as agreements that did not reach the ratification stage (TPP); lobbying activities carried out after the signature of the agreement (when lobbying can only affect legislators' ratification decisions) and before (when the content of the agreement can still be modified).

Figure 1
Firms' position on all FTAs (based on ratification bills)



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

Figure 1 illustrates the share of observations corresponding to a pro/anti FTA position by lobbying firms. This figure is constructed using our main dataset, based on 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 firms' position on the actual trade deal that, if ratified, will be implemented. Opposition to trade agreements is extremely rare: in 99.25% of the cases, firms lobbied in support of the agreement.[36]

Using bill numbers to track lobbying on FTAs does not allow us to examine lobbying expenditures related to the Trans-Pacific Partnership (TPP), a major FTA that was signed by President Obama in February 2016, but never reached the ratification stage due to the election of President Trump. To verify whether lobbying firms supported or opposed the entry into force of this agreement, we have collected all lobbying reports filed by firms in 2016 that mention the words *Trans-Pacific Partnership* or *TPP*. In that year, 276 firms filed 1.041 lobbying reports related to the TPP agreement. Again, we find evidence of overwhelming support for the FTA: 98.4% of all lobbying firms for which we can confidently sign the position on the FTA lobbied in favor of the agreement.[37]

Fact 1 also holds when looking at lobbying expenditures incurred before the ratification of FTAs, when firms can still affect some of the provisions contained in the agreement (e.g. rules on investments and intellectual property rights). To verify this, we have collected all lobbying reports that mention the words *KORUS*, *US-Korea FTA* or *US-Korea Free Trade Agreement*.[38] We have obtained 588 reports filed by firms during the 2000-2011 period (see Figure A-8 in the Appendix).[39] Again, in virtually all cases (97.8%) lobbying firms supported the agreement (see Figure A-9).

One could be concerned that firms that support the ratification of FTAs may do so knowing that they will anyway be sheltered from increased import competition from the FTA partners. This would be the case if firms could exclude their products from the trade agreement. Recall, however, that exceptions are extremely rare in US FTAs, in line with Article XXIV of the GATT (Kohl *et al.*, 2020). Trade defense measures such as antidumping (AD) duties could also be used to protect import-competing firms following the entry into force of an FTA. However, several studies show that FTAs actually reduce the use of AD duties (e.g. Ahn and Shin, 2011; Silberberger and Stender, 2018; Tabakis and Zanardi, 2019).

[36] Of the 112 lobbying firms for which we can confidently code the position on the FTA, 110 always lobbied in favor of the agreement. Only 2 textile firms lobbied against an FTA (with Korea); interestingly, the same firms supported the ratification of other FTAs (with Colombia and Panama).

[37] Based on information from Section 16 of the lobbying reports and official company statements, we were able to code the position of the lobbying firm in 93.8% of the cases.

[38] We can only observe lobbying expenditures on FTAs negotiated by the United States after LDA was passed in 1995. For this robustness check, we focus on KORUS, the most important of the agreements in force.

[39] Notice that most 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.

Fact 1 supports Rodrik (2018)'s argument that large well-connected firms on the export side dominate the politics of trade agreements. It also echoes some of the findings of Osgood (2017), who examines public expressions of support and opposition by firms and trade associations concerning all US FTAs after NAFTA and two bilateral agreements associated with the extension of Permanent Normal Trade Relations to China and Russia. He finds that the public position of firms and association is "overwhelmingly likely to be *support*, not opposition" to these trade agreements.

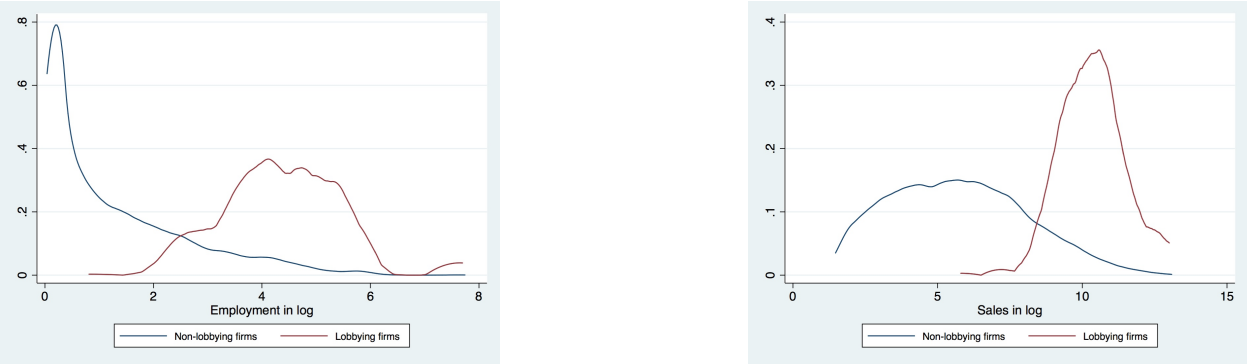
Two other facts emerge when matching our lobbying dataset with Compustat. The first concerns the role of firm size in explaining the extensive margin of lobbying on trade agreements:

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. Figure 2 shows 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.

Figure 2

Employment and sales distribution (lobbying vs non-lobbying firms)



The figure plots the log of $Employment_{f,t}$ and the log of $Sales_{f,t}$ for lobbying and non-lobbying firms.

The 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.[40] The results are reported in Table 1. The dependent variable is $Lobbying\ on\ FTA_{f,j,a,t}$, 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 $Employment_{f,t}$ or $Sales_{f,t}$ to proxy for firm size.[41] We also include FTA fixed effects and sector fixed effects (at the SIC2 level) to account for differences across trade agreements and across industries. We cluster

[40] We have also tried to compare firms in terms of their labor productivity ($Sales/Employment_{f,t}$). As expected, firms lobbying on FTAs are significantly more productive than non-lobbying firms.

[41] 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 $Employment_{f,t}$ and $Sales_{f,t}$ in the same specification because of multicollinearity (the correlation between them is above 0.8).

standard errors at the FTA-SIC1 level (as discussed later, the results are robust to alternative clustering).

The positive and significant coefficients of the variables $Employment_{f,t}$ and $Sales_{f,t}$ support Fact 2: larger firms are more likely to lobby on trade agreements. The effect is sizable: our 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. Notice that lobbying on trade agreements is a rare event: the predicted probability of lobbying reported at the bottom of Table 1 is 0.0037. Our estimates thus imply a 1 percent increase in the probability of lobbying for every percentage point increase in firm size.[42] These results echo results by Kim (2017), who shows that pro-trade lobbying is correlated with firm size, though his analysis is not focused on lobbying expenditures related to trade agreements.

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

	(1)	(2)
log(Employment$_{f,t}$)	0.004***	
	(0.0003)	
log(Sales$_{f,t}$)		0.004***
		(0.0010)
FTA FE	Yes	Yes
SIC2 FE	Yes	Yes
Observations	67,716	67,716
Pseudo R^2	0.463	0.504
Predicted probability	0.0037	0.0037

The table reports marginal effects of probit regressions. The dependent variable, *Lobbying on* $FTA_{f,j,a,t}$, is a dummy variable equal to 1 if firm f producing good j lobbies on the ratification of agreement a in year t. The variable $Employment_{f,t}$ is the total number of employees of firm f in year t, while $Sales_{f,t}$ is total sales by firm f in year t. Standard errors in parenthesis clustered at the FTA-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 and operating in comparative advantage sectors are more likely to lobby on FTAs.*

Table 2 reports the results of probit regressions in which we examine how the probability that a firm lobbies on trade agreements depends on whether the sector it operates in is tradable, the extent to which the US has a comparative advantage in this sector, and the firm's participation in international trade.

[42] This result is obtained by dividing the marginal effects of the variables $Sales_{f,t}$ and $Employment_{f,t}$ by the average predicted probability of lobbying reported at the bottom of the table.

Column 1-2 show that firms operating in tradable sectors are more likely to lobby on FTAs. In column 1, we only include the dummy variable *Tradable sector*$_j$ with FTA and broad industry fixed effects. In column 2 we also control for firm size by including the variable *Employment*$_{f,t}$. In both specifications, the marginal effect of *Tradable sector*$_j$ is positive and significant at the 1 percent level. The effect is sizable: our estimates imply that operating in tradable sectors increases the likelihood of lobbying on FTAs by between 143 and 278 percentage points.[43]

Table 2
Probability of lobbying on FTAs, the role of trade

	(1)	(2)	(3)	(4)	(5)	(6)
Tradable sector$_j$	0.006**	0.010***				
	(0.0021)	(0.0029)				
log(RCA$_{j,a}$)			0.0002***	0.0002***		
			(0.0001)	(0.0001)		
Exporter and/or importer$_{f,t}$					0.031**	0.018**
					(0.0133)	(0.0078)
log(Employment$_{f,t}$)		0.004***		0.0011***		0.010***
		(0.0010)		(0.0001)		(0.0030)
FTA FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE (SIC2)	Yes	Yes	Yes	Yes	Yes	Yes
Observations	64,265	64,265	23,532	23,532	12,435	12,435
Pseudo R^2	0.203	0.491	0.882	0.931	0.209	0.466
Predicted probability	0.0035	0.0036	0.0067	0.0065	0.0109	0.0111

The table reports marginal effects of probit regressions. The dependent variable, *Lobbying on FTA*$_{f,j,a,t}$, is a dummy variable equal to 1 if firm f producing good j lobbies on the ratification of agreement a in year t. *Tradable sector*$_j$ is a variable dummy equal to 1 if sector j is classified as tradable. $RCA_{j,a}$ measures the extent to which the United States has a revealed comparative advantage in sector j relative to the FTA partner(s) of agreement a. The dummy *Exporter and/or importer*$_{f,t}$ is equal to 1 if firm f exports and/or imports in year t. *Employment*$_{f,t}$ is the total number of employees of firm f in year t. Standard errors in parenthesis clustered at the FTA-SIC1 level. Significance levels: *; 10%; **: 5%; ***: 1%.

In column 3-4, we study how the probability that a firm lobbies on a trade agreement depends on whether it operates in a sector in which the US has a comparative advantage vis-à-vis the FTA partner. Notice that, compared to columns 1-2, the number of observations drops from 64,265 to 23,532. This is due to the fact that the variable $RCA_{j,a}$ can only be defined for firms operating in manufacturing sectors. In both specifications, the coefficient of the log of $RCA_{j,a}$ is positive and significant at the 1 percent level, indicating that firms are more likely to lobby on trade agreements when they operate in sectors in which the US has a stronger comparative advantage vis-à-vis the FTA partner(s). In terms of magnitude, our estimates imply that, for every percentage point

[43]These results are obtained by dividing the marginal effect of the dummy variable *Tradable sector*$_j$ in columns 1-2 of of Table 2 by the average predicted probability of lobbying reported at the bottom of the table.

increase in the RCA variable, the probability of lobbying increases by 0.03 percent.[44]

As discussed in Section 2, we have also constructed the dummy variable *Exporter and/or importer*$_{f,t}$, combining information from Compustat on firms' export sales and/or foreign clients and on firms' imports from Jain *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 5-6 of Table 2, the number of observations drops to 12,435. The marginal effect of the variable *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 162 and 284 percentage points.[45]

We have carried out additional estimations to verify the robustness of the results documented in Tables 1 and 2. Our model suggests that the effects of a trade agreement on firms' payoffs – and thus on their incentives to lobby – should be heterogeneous across FTAs and sectors, depending on the size of the the initial tariffs on final and intermediate goods. For this reason, in Tables 1 and 2 we have clustered standard errors at the FTA-SIC1 level. We have verified that these results continue to hold if we cluster standard errors at the FTA level or at sectoral (SIC1 or SIC2) level. The results are also robust to using a linear probability model to estimate the probability of lobbying on FTAs.[46]

4 Model

In the previous section we have shown that only a few large US firms lobby on FTAs, and virtually all of them support the ratification of trade agreements. Moreover, relative to non-lobbying firms, lobbying firms are larger, more likely to be engaged in international trade and to operate in comparative advantage sectors.

To rationalize these findings, we develop a new model of endogenous lobbying on trade agreements by heterogeneous firms. In Section 4.1 we describe the economic structure of the model, which allows us to study the distributional effects of trade agreements. We consider first the effects of an FTA in the canonical model of firm heterogeneity under monopolistic competition (Melitz, 2003). The entry into force of the agreement creates winners and losers. Non-exporting firms lose, since they suffer from the increase in competition in the domestic market and do not benefit from the improved access to the foreign market. By contrast, exporting firms gain, with the most productive among them being the biggest winners. The key insight of the canonical model is that the

[44] This result is obtained by dividing the marginal effects of the variable $RCA_{j,a}$ by the average predicted probability of lobbying reported at the bottom of the table.

[45] These results are obtained by dividing the marginal effect of the dummy variable *Exporter and/or importer*$_{f,t}$ by the average predicted probability of lobbying on FTAs reported at the bottom of the table.

[46] The results of these robustness checks (available upon request) confirm that lobbying firms are larger than non-lobbying firms and more likely to be engaged in international trade.

biggest winners have higher stakes in the ratification of the agreement than the biggest losers. We show that this insight carries through in models of oligopolistic competition – in which firms have mass and can thus affect policy outcomes – if we allow for a monopolistically competitive fringe or for cross-country technological differences.

In Section 4.2, we 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.

In Section 4.3 we show that this theoretical model can rationalize our empirical findings on the extensive margin of lobbying on trade agreements. Finally, in Section 4.4, we derive results on the intensive margin of lobbying.

4.1 Economic Structure

We describe a model of trade between two countries, Home and Foreign. We use a * to denote variables related to Foreign. We examine the effects of a proposed FTA between Home and Foreign, which leads to the elimination of tariffs in all sectors. In the baseline model, we assume that the two countries are symmetric. We later show that our results carry through if we allow for asymmetries across countries.

In each country, the economy consists of $J+1$ sectors indexed by j and labor is the only factor of production. Sector 0 is a homogeneous good chosen as the numeraire, which is produced under constant returns to scale technology, sold under perfect competition, and freely traded.

There is a unit mass of consumers, who share the same quasi-linear and additively separable preferences:

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

where q_0 represents the consumption of the numeraire good, and Q_j is the consumption of all other differentiated goods.

Insights from the Canonical Model of Firm Heterogeneity

We start by describing the effects of the FTA in the canonical model of trade with firm heterogeneity (Melitz, 2003), in which there is a continuum of monopolistically competitive firms in each sector $j \geq 1$.

In what follows, we consider the case of symmetric non-numeraire sectors and drop the sectoral subscript. This allows us to focus on the role of within-sector productivity differences and intra-industry trade. We later discuss the implications of allowing for cross-country productivity differences and inter-industry trade. Firm heterogeneity takes the same form: in each country and

sector, a firm draws its productivity φ from the cumulative distribution $G(\varphi)$.

Within each sector, there is a continuum of horizontally differentiated varieties V indexed by i. Preferences are assumed to take the Constant Elasticity of Substitution (CES) form of Dixit and Stiglitz (1977):

$$u(Q) = \frac{\beta\sigma}{\sigma - 1} \ln \left(\int_V q_i^{\frac{\sigma-1}{\sigma}} di \right),$$

where $\sigma > 1$ is the elasticity of substitution and $\beta < 1$ is the expenditure in this sector.

Selling a variety domestically comes at a fixed cost F_D, while exporting it to Foreign requires both a fixed cost F_X and variable trade costs, which consist of an ad-valorem tariff $\tau = 1 + t$, such that $F_D > (1+t)^{1-\sigma} F_X$.[47]

Each firm i sets its (free-on-board) price at

$$p_i = 1/\rho\varphi_i, \quad \text{where} \quad \rho = \frac{\sigma - 1}{\sigma}$$

and its overall profits are given by

$$\Pi_i = \frac{1}{\sigma} (\rho \mathcal{P} \varphi_i)^{\sigma-1} - F_D + \left(\frac{1}{\sigma} \left(\frac{\rho \mathcal{P} \varphi_i}{(1+t)} \right)^{\sigma-1} - F_X \right) \mathbf{1}_X(i), \tag{2}$$

where $\mathcal{P} = \left(\int_V p_i^{1-\sigma} di \right)^{\frac{1}{1-\sigma}}$ is the price index at home and abroad and $\mathbf{1}_X(i) = 1$ is an indicator variable equal to 1 if firm i exports. The productivity of the largest (resp. smallest) non-exporting firm is a function of the tariffs, $\varphi_D(t)$ and $\varphi_X(t)$.

As shown by Melitz and Redding (2014), a reduction in domestic tariffs increases competition by lowering $\mathcal{P}$, which leads to tougher selection into entry and thus a higher $\varphi_D(t)$. When the reduction in tariffs is reciprocal, as in the case of an FTA, exporters enjoy better access to the foreign market (i.e. $(1+t)^{-1}$ increases), which leads to a fall in the export cutoff $\varphi_X(t)$. Using the free-entry condition to close the model, they also show that $\Theta(t) := \mathcal{P}^{\sigma-1} \left(1 + (1+t)^{1-\sigma} \right)$ is a decreasing function of t. In other words, for all continuing exporters (i.e. all firms for which $\mathbf{1}_X(i) = 1$ before and after the agreement), the increase in market access necessarily offsets the increase in competition in both markets.

The entry into force of an FTA creates winners and losers in each sector. We denote with $\Delta\Pi_i$ the variation in profits of firm i following the entry into force of the agreement.

All continuing exporters benefit from the FTA ($\Delta\Pi_i > 0$), since the gains associated with improved access to the foreign market dominate the losses due to increased competition. Using (2), note that overall exporters' profits are supermodular in market access $(1+t)^{-1}$ and productivity

[47] The key results continue to hold if tariffs are per unit. Furthermore, instead of introducing additional trade frictions that are not removed by the FTA, we assume without loss of generality that firms always maximize their profits independently in the two markets, even when tariffs are entirely removed ($t = t^* = 0$).

φ_i. Formally,

$$\frac{d^2\Pi_i}{d\varphi_i d[(1+t)^{-1}]} > 0. \tag{3}$$

It follows that the largest gains from the trade agreement, $\max_i \Delta\Pi_i$, are reaped by the most productive exporters. In the presence of a few very large firms (typically captured by an unbounded lognormal or Pareto distribution of productivity), the gains achieved by these "superstar" exporters following the entry into force of the FTA can be arbitrarily large.

By contrast, all non-exporting firms lose from the FTA ($\Delta\Pi_i < 0$), since they suffer from the increase in competition in the domestic market and do not benefit from the improved access to the foreign market. The maximum loss is suffered by the most productive non-exporting firm, i.e. the one with productivity $\varphi_{X0} \equiv \varphi_X(t=0)$. In the worst case scenario, this firm is forced to exit the market incurring a loss equal to $\min_i \Delta\Pi_i = -\frac{1}{\sigma}\left(\rho\mathcal{P}\varphi_{X0}\right)^{\sigma-1} < 0$.

The key insight from the canonical model is that the biggest winners from an FTA have higher stakes in the agreement than the biggest losers (i.e. $\max_i \Delta\Pi_i$ is larger in absolute terms than $\min_i \Delta\Pi_i$).

Extending the Logic to Heterogeneous Oligopolistic Firms

The canonical model of firm heterogeneity described above assumes a continuum of firms in each sector, implying that each of them is too small to have an impact on market aggregates such as the price index. This assumption is hard to maintain when studying lobbying behavior: firms with no mass would not be able to affect aggregate policy outcomes and would thus have no incentives to lobby on the ratification of an FTA.[48]

Explaining lobbying by individual firms thus requires large firms, which can affect both market and policy outcomes. It is worth pointing out that in models of oligopolistic competition the distributional effects of a trade agreement can be very different from those described above. As shown by Brander and Krugman (1983), in a simple oligopoly trade model with no firm heterogeneity and CES demand, exporting firms may lose from an FTA. Indeed, the gains associated with improved access to the foreign market do not systematically dominate the losses due to increased competition. Furthermore, even in oligopolistic settings with firm heterogeneity and CES demand, the supermodularity property (3) might not hold (see Nocke and Shutz, 2018).

In Section B-1 of the Theoretical Appendix, we show that the key insights of the canonical model can nevertheless continue to hold with heterogeneous oligopolistic firms, which internalize their impact on the intensity of competition. Specifically, we describe two market structures in which exporters' profits remain supermodular in market access and productivity (property 3 holds) and in which the biggest winners from the FTA have higher stakes in the agreement than the biggest losers.

[48] See Section B-2 of the Theoretical Appendix.

In Section B-1.1, we consider a setting in which a few oligopolistic firms coexist with a fringe of monopolistically competitive firms, as in Shimomura and Thisse (2012) and Parenti (2017). This mixed market structure captures the fact that the firm size distribution is highly skewed in most sectors, featuring a large number of small firms and a few large firms (e.g. Axtell, 2001; Bernard *et al.*, 2007).[49] The key feature of this market structure is that oligopolistic firms have mass, and can thus affect both economic and political outcomes, while monopolistically competitive firms have no mass, so their individual actions are inconsequential. The presence of a monopolistically competitive fringe implies that the competition effects of an FTA are entirely absorbed by the exit of small firms. In turn, this allows large oligopolistic firms to increase their profits abroad while being sheltered from losses in their domestic market. The agreement benefits all exporters, with the most productive among them making larger gains.

In Section B-1.2, we consider instead a model of pure oligopolistic competition (i.e. without a monopolistically competitive fringe) with heterogeneous firms and endogenous entry. We relax the assumption of symmetry across $j \geq 1$ sectors to emphasize the role of cross-country differences in technology. When firms have a technological advantage over their foreign competitors, they are at least partially sheltered from an increase in competition in their market. We show that the maximum gains from the FTA are experienced by the most productive firms in comparative advantage sectors, while the maximum losses are suffered by the most productive firms in comparative disadvantage sectors. Crucially, the winners are more productive than the losers, implying that the maximum gains are larger in absolute terms than the maximum losses.[50]

It should be stressed that, in a simple model of firm heterogeneity à la Melitz (2003), an FTA benefits exporting firms only by improving access to consumers in the foreign market. However, the literature on firm heterogeneity suggests other channels through which trade agreements can benefit "global firms" (Bernard *et al.*, 2018), including technology upgrading (e.g. Bustos, 2011) and a reduction in the cost of sourcing inputs from foreign suppliers (e.g. Antràs *et al.*, 2017). Accounting for these additional channels can help to satisfy (3) and can increase the gains that the most productive firms can achieve through FTAs.

To sum-up, in an environment where firms differ in their productivity and thus in their access to foreign markets, an FTA creates winners and losers. Following the canonical Melitz model, the most productive exporters benefit the most from the trade agreement, and their gains are larger in absolute than the maximum losses suffered by non-exporting firms. The same insights hold for an oligopolistic market structure in which large firms are sheltered from losses in their domestic

[49] For example, Bernard *et al.* (2007) report that 96% of US exports in 2000 were made up by 0.4% of US firms, implying that aggregate trade patterns of an industry fcan be shaped by the individual behavior of a few firms.

[50] Consider, for example, a sector in which the Home country has a technological advantage large enough that the FTA leads to one-way trade from Home to Foreign. In this case, the biggest gains from the FTA ($\max_i \Delta\Pi_i > 0$) are experienced by the most productive Home firm in that sector, while the while the biggest losses ($\min_i \Delta\Pi_i < 0$) are experienced by the most productive Foreign firm. It is straightforward to show that the maximum gains outweigh the maximum losses in absolute terms ($\max_i \Delta\Pi_i > -\min_i \Delta\Pi_i$).

market by the presence of a competitive fringe or by their technological advantage, and the demand and trade costs guarantee supermodularity of the profit function.

In the next section, we turn to the political structure of the model and assume that exporters' profits are supermodular in market access and productivity (property (3) holds) and that the FTA generates arbitrarily large gains for some "superstar" exporters, while the stakes of the losers remain limited.

4.2 Political Structure

In the previous section, we have examined the distributional effects of a proposed FTA between Home and Foreign. If the agreement enters into force, it leads to the reciprocal elimination of all tariffs, creating winners and losers in each sector.

We next describe the political structure of the model, in which firms across all sectors choose whether to lobby and how much to spend in favor of or against a proposed FTA. We use f to refer to firms in the lobbying game, and denote with Ω_P the set of Home firms that are pro agreement (i.e. for which $\Delta\Pi_f > 0$) and with Ω_A the set of Home firms that are against it (i.e. for which $\Delta\Pi_f < 0$).[51]

Each firm decides its lobbying contribution l_f (which can be 0 for non-organized firms) to support or oppose the ratification of the agreement. Within the set of pro and anti-FTA firms, lobbying expenditures are aggregated into an overall group effort, $\mathcal{L}_P = \sum_{f\in\Omega_P} v(l_f)$ for pro-FTA firms and $\mathcal{L}_A = \sum_{f\in\Omega_A} v(l_f)$ for anti-FTA firms, where $v(.)$ is an increasing function.

To model ex-ante lobbying, we follow the literature on contests (e.g. Tullock, 1980; Becker, 1983; Dixit, 1987; Esteban and Ray, 2001; Siegel, 2009; Bouton *et al.*, 2018). Contests are economic or social interactions in which two or more players spend costly resources in order to win a conflict. Contest success functions determine the probabilities of winning and losing as a function of the effort levels of each party to the conflict.

We introduce two novel features in the standard Tullock contest success function, in which the probability that one of the parties wins depends on the ratio of efforts of the parties in the conflict.[52] The first is political uncertainty. We assume that politicians deciding whether to ratify the FTA may have a bias B in favor of the agreement ($B < 0$) or against it ($B > 0$).[53] A negative bias could arise due to distributional concerns: politicians who are averse to inequality may worry that

[51] Notice that the lobbying game is at the economy-wide (rather than sectoral) level, with firms in different sectors sharing the same policy preferences (pro or against the agreement). While there are no inter-sectoral linkages in the economic structure of the model, the political structure thus features an interdependence between firms operating in different sectors.

[52] This is the workhorse functional form in the literature on rent-seeking and is sometimes referred to as the "power" or "ratio" form. See Jia *et al.* (2013) for a discussion of the theoretical foundations of contest success functions.

[53] Introducing a political bias is reminiscent of contest models in which a party may have a "head start" over others (e.g. Siegel, 2009 and 2010).

the entry into force of the FTA would hurt small firms in their constituency.[54] We model B as a random variable, reflecting uncertainty about the direction of the political bias. The only constraint that we impose on this variable is that its support is non-empty for both negative and positive real numbers, which simply rules out that the direction of the political bias is deterministic.[55]

Second, the number and identity of lobbying firms is endogenous. Firms weigh the increase in the probability of ratification due to their own participation against their lobbying costs. Crucially, the outside option (not lobbying) is also endogenous, as the probability of ratification depends on the number of lobbying firms.

The FTA is implemented only if politicians in both countries ratify it. Assuming that the political biases B and B^* are independent across countries and that firms can only lobby in their own country, the expected probability that the trade agreement enters into force can be written as the product of the expected probability of ratification in Home and Foreign, i.e. $\mathbb{E}[P(\mathcal{L}_P, \mathcal{L}_A, B)] \cdot \mathbb{E}[P^*(\mathcal{L}_P^*, \mathcal{L}_A^*, B^*)]$.[56]

The payoff from lobbying of firm f is

$$(\mathbb{E}[P(\mathcal{L}_P, \mathcal{L}_A, B)] - \mathbb{E}[P(\mathcal{L}_P - v(l_f), \mathcal{L}_A, B)]) \cdot \mathbb{E}[P^*(\mathcal{L}_P^*, \mathcal{L}_A^*, B^*)] \cdot \Delta\Pi_f - l_f, \tag{4}$$

where $\Delta\Pi_f > 0 \ \forall f \in \Omega_P$ and $\Delta\Pi_f \leq 0 \ \forall f \in \Omega_A$. We assume that $v(.)$ is a concave and twice differentiable function with $v(0) = 0$, implying decreasing returns to lobbying. The concavity of $v(.)$ also implies that, within a group, lobbying expenditures are (imperfect) substitutes and guarantees an interior solution to each lobbying firm's problem.[57] We also require that $\kappa \equiv v'(0) < +\infty$. In the presence of uncertainty in the direction of the political bias, this assumption implies a finite expected return to lobbying on the first dollar spent. It is straightforward to show that otherwise all firms would lobby, no matter how small their gains or losses from the trade agreement.[58]

The probability that the FTA is ratified by the Home country conditional on the political bias B can be written as

$$P(\mathcal{L}_P, \mathcal{L}_A, B) \equiv \frac{\mathcal{L}_P + B^+}{\mathcal{L}_P + \mathcal{L}_A + \mid B \mid}. \tag{5}$$

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

A couple of remarks are in order. First, the fact that the policy outcome is probabilistic reflects

[54] Re-election motives can also lead to a protectionist bias, as shown by Conconi *et al.* (2014).

[55] From the perspective of the firms in our dataset, this assumption implies that, at the time of their lobbying, they are still uncertain about whether there is a majority of Congressmen in favor of FTA ratification.

[56] 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 would choose to lobby in both countries and their expenditures at Home would be 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.

[57] For any overall lobbying expenditure L, $v(.)$ is concave if and only if $N_L v(L/N_L)$ increases with the number of lobbying firms N_L, for any $N_L > 0$.

[58] The assumptions that κ is bounded and that the direction of the political bias is random guarantee that the marginal impact of lobbying expenditures on the probability of FTA ratification is continuous and bounded.

some randomness in the effectiveness of lobbying efforts, as in standard contest success functions (see Jia *et al.*, 2013 and Section B-3 in the Theoretical Appendix for microfoundations). Introducing the political bias B into the standard contest success function is equivalent to adding a random effort from a player who can be in favor of or against the agreement. Notice that, differently from the standard contest success function, this implies that the probability of FTA ratification is itself a random variable. When the political bias is positive, it is as if the effort of the group in favor of the FTA is augmented by B. On the contrary, when the bias is negative, it is as if the effort of the anti-FTA group is augmented by $B^- = -B > 0$. Compared to a situation without any bias, this unambiguously raises (lowers) the probability that an FTA is ratified in the absence of pro-FTA (anti-FTA) contributions.

Second, uncertainty in the direction of the political bias rules out trivial Nash equilibria where firms in both countries would choose not to lobby. From the perspective of a firm in the Home country, even if all firms in Foreign were to lobby against (or in favor of) the ratification of the agreement, the expectation about the probability of the Foreign country ratifying the agreement $\mathbb{E}[P^*(\mathcal{L}_P^*, \mathcal{L}_A^*, B^*)]$ is strictly bounded between 0 and 1, due to uncertainty in B^*. Therefore, without loss of generality, we assume that $0 < \mathbb{E}[P^*(\mathcal{L}_P^*, \mathcal{L}_A^*, B^*)] < 1$, i.e. all pro-FTA (resp. anti-FTA) firms in Home conjecture a non-zero expected probability of ratification (resp. non ratification) by Foreign. In what follows, we focus on firms lobbying in the Home country, taking as given the expected probability $\mathbb{E}[P^*]$ that the partner country ratifies the agreement.

4.3 Firm Lobbying on FTAs: Extensive Margin

In this section, we characterize the Nash equilibrium in which a subset of firms select into lobbying, i.e. choose a positive lobbying expenditure $\hat{l}_f$. The first-order condition associated with a pro-FTA lobbying firm $f \in \Omega_P$:

$$v'(\hat{l}_f)\mathbb{E}\left[\frac{\hat{\mathcal{L}}_A + B^-}{\left(\hat{\mathcal{L}}_P + \hat{\mathcal{L}}_A + \mid B \mid\right)^2}\right] \cdot \mathbb{E}[P^*] \cdot \Delta\Pi_f = 1. \tag{6}$$

where $\hat{\mathcal{L}}_P = \sum_{f \in \Omega_P} v(\hat{l}_f)$ (resp. $\hat{\mathcal{L}}_A$) denotes the overall equilibrium lobbying effort of pro-FTA (resp. anti-FTA firms).

Inspecting (6), we note that when the overall equilibrium lobbying effort $\hat{\mathcal{L}}_P$ is higher among pro-FTA firms, each individual firm in that group contributes less. Thus lobbying expenditures within a group are strategic substitutes: the participation of a new firm increases $\hat{\mathcal{L}}_P$, decreasing individual lobbying efforts. A similar reasoning applies to anti-FTA firms. Using equation (4), we thus obtain our first lemma:

Lemma 1. *The contribution of an additional pro-FTA (resp. anti-FTA) firm to the overall lobbying*

effort in favor of (resp. against) the FTA decreases the payoff from lobbying of all other pro-FTA (resp. anti-FTA) firms.

In order to characterize the endogenous set of lobbying firms, we turn to the incentives of a non-politically organized firm to start lobbying. For example, let us consider the incentives of a pro-FTA firm g with a potential gain $\Delta\Pi_g$ from the agreement to add $v(l_g)$ to the overall equilibrium lobbying effort of pro-FTA firms $\hat{\mathcal{L}}_P$ (the same reasoning applies to an anti-FTA firm).

The firm decides on its lobbying expenditure l_g as follows

$$\max_{l_g \geq 0} \left(\mathbb{E}[P(\hat{\mathcal{L}}_P + v(l_g), \hat{\mathcal{L}}_A, B)] - \mathbb{E}[P(\hat{\mathcal{L}}_P, \hat{\mathcal{L}}_A, B)] \right) \cdot \mathbb{E}[P^*] \cdot \Delta\Pi_g - l_g. \tag{7}$$

It is clear that, if a pro-FTA firm f with a lower potential gain from the FTA $\Delta\Pi_f < \Delta\Pi_g$ finds it optimal to lobby, so does firm g. To see this, consider the first-order condition (6) for lobbying firm f. Given that $v''(.) < 0$, the increment in the ratification probability due to the first dollar spent by firm f is weakly larger than the increment achieved by firm g. Since $\Delta\Pi_g > \Delta\Pi_f$, the return to lobbying for firm g on its first dollar is strictly bigger than 1, so this firm would necessarily lobby as well. We can thus state the following:

Lemma 2. *Any equilibrium must feature perfect sorting: if a pro-FTA (resp. anti-FTA) firm finds it profitable to lobby in equilibrium, then any pro-FTA (resp. anti-FTA) firm which expects a larger gain (resp. loss) from the FTA will also lobby.*

We can also show that firms experiencing larger gains (or losses in absolute value) from the FTA gain more from lobbying (see Section B-4 of the Theoretical Appendix for a proof of this complementarity):

Lemma 3. *The expected payoff from lobbying is an increasing function of* $\mid \Delta\Pi_f \mid$.

In the remaining of this section, we use the three lemmas above to rationalize the main finding of our empirical analysis, namely that firms lobbying on FTAs are always in favor of their ratification (Fact 1). From Lemma 2, it is sufficient to require that the firm that would experience the largest loss from the FTA would never find it profitable to lobby against it. Recall that $\min \Delta\Pi_f < 0$ denotes the maximum loss experienced by a firm if the agreement enters into force. By Lemma 1, the payoff from lobbying for this firm is the largest when it is the only anti-FTA firm to be politically organized. Even in this case, for a given pro-FTA group effort $\hat{\mathcal{L}}_P$, the biggest loser will not find it profitable to lobby iff

$$\kappa \mathbb{E}\left[\frac{\hat{\mathcal{L}}_P + B^+}{\left(\hat{\mathcal{L}}_P + \mid B \mid \right)^2} \right] \mathbb{E}\left[P^*\right] (-\min \Delta\Pi_f) < 1.$$

Noting that $\frac{\hat{\mathcal{L}}_P+B^+}{\left(\hat{\mathcal{L}}_P+|B|\right)^2} < \frac{1}{|B|} \; \forall \; \mathcal{L}_P \geq 0$, we obtain a sufficient condition for no lobbying by anti-FTA firms:

$$\kappa \mathbb{E}\left[\frac{1}{|\ B\ |}\right](-\min \Delta\Pi_f) < 1. \tag{8}$$

In what follows, we will assume that (8) holds. This condition guarantees that no firm has incentives to lobby against the trade agreement, in line with Fact 1. Given that $\kappa < +\infty$, small pro-FTA firms will also not find it profitable to lobby. By contrast, the presence of "superstar exporters" guarantees that at least some firms make large enough gains from the FTA to find it profitable to lobby in favor of the agreement.[59]

We now turn to the characterization of the equilibrium set of pro-FTA firms that are politically active, Ω_L. When only pro-FTA firms lobby, we can rewrite the contest success function (equation (25)) as a function of the overall contributions of firms in favor of the agreement and the political bias, i.e. $P(\mathcal{L}_P, B) \equiv \frac{\mathcal{L}_P+B^+}{\mathcal{L}_P+|B|}$.

Using Lemmas 1-3 above, in Section B-5 of the Theoretical Appendix we prove that the payoff from lobbying of the smallest firm in Ω_L is a decreasing function of the number of lobbying firms. This guarantees that there is a unique equilibrium.[60]

Combining Lemma 3 with the supermodularity property (3) implies that Ω_L will include the largest and most productive firms in the economy, which gain the most from the FTA.

Result 1. *When only pro-FTA firms have incentives to be politically organized, there is a unique equilibrium in which only the largest exporters select into lobbying* ($\Omega_L \subset \Omega_P$).

An appealing feature of our model is that it generates a unique equilibrium in which only the largest winners from the FTA are politically organized. An alternative way to generate selection into lobbying would be to assume fixed lobbying costs. However, this would result in multiple equilibria, both in terms of lobbying expenditures and in terms of the set of politically organized firms, as in Bombardini (2008). Moreover, these equilibria need not feature perfect sorting.[61]

Note that the model features free riding: firms in Ω_P that do not lobby benefit from the lobbying effort of pro-FTA firms that select into Ω_L. It can be shown that free-riding lowers overall lobbying by pro-FTA firms (see Section B-6 in the Theoretical Appendix). This type of free riding can occur across firms operating in the same sector: small non-organized firms in industry j can benefit from the lobbying efforts of larger firms in the same sector. Given the economy-wide nature of the FTA,

[59] A sufficient condition for pro-FTA lobbying is $\kappa \mathbb{E}\left[\frac{B^-}{|B|^2}\right] \mathbb{E}\left[P^*\right] \max \Delta\Pi_f > 1$, where $\max \Delta\Pi_f$ denotes the maximum gains from the FTA. Recall that the gains achieved by "superstar exporters" can be arbitrarily large, which guarantees that this condition is satisfied.

[60] The existence of an equilibrium is guaranteed by the presence of superstar exporters.

[61] This is a general feature of models of asymmetric oligopoly with endogenous entry upon the payment of fixed costs. Intuitively, even a highly productive firm may face a low residual demand in the presence of a large number of low-productivity firms, making it unprofitable to pay a fixed entry cost. To restore uniqueness and perfect sorting, we would then need to assume that the firms that experience the largest gains from lobbying move first, as in Gaubert and Itskhoki (2018).

it can also arise across firms in different sectors: non-organized firms in industry j can benefit from the lobbying effort of firms in industry j'.

Summing up, our theoretical model provides a simple rationale for the empirical findings documented in Section 3 on the extensive margin of firm-level lobbying on trade agreements. First, the model explains why lobbying firms always support FTAs: only those firms that gain the most from the entry into force of these agreements have incentives to lobby. Second, it is consistent with the fact that lobbying on trade agreements is a rare event, even among publicly traded companies, and that lobbying firms are larger than non-lobbying firms. Third, it explains why firms that lobby on trade agreements are more likely to be involved in international trade and tend to operate in sectors in which the United States has a large comparative advantage compared to the FTA partners.[62]

4.4 Firm Lobbying on FTAs: Intensive Margin

In this section, we characterize the intensive margin of lobbying and derive results about lobbying expenditures of organized firms, which we will take to the data in the next section.

When only pro-FTA firms lobby, equation (6) boils down to

$$v'(\hat{l}_f)\mathbb{E}\left[\frac{B^-}{\left(\hat{\mathcal{L}}_{P^+} \mid B \mid\right)^2}\right] \cdot \mathbb{E}[P^*] \cdot \Delta\Pi_f = 1. \tag{9}$$

Comparing two lobbying firms f and g, relative marginal lobbying efforts are determined by the relative gains from the FTA as follows:

$$\frac{v'(l_f)}{v'(l_g)} = \frac{\Delta\Pi_g}{\Delta\Pi_f} \quad \forall \ f \text{ and } g \in \Omega_L. \tag{10}$$

Thus firms that expect to gain more from a trade agreement have higher lobbying expenditures. Since equation (3) guarantees that the biggest winners from an FTA are also the largest firms, we can state the following result:

Result 2. *For a given FTA, larger firms spend more lobbying to support the agreement.*

Under stronger assumptions, we can also derive how lobbying expenditure of individual lobbying firms vary with their stakes in the agreement, which depend on the initial tariffs and the size of the FTA partner. We assume that higher stakes increase the profits of all exporting firms proportionally. This is the case for instance in the canonical Melitz model considered in Section 4.1, in which profit gains are linear in $(1 + (1 + t)^{1-\sigma})$ and in the demand parameter β. Equation (10) then implies that the relative marginal lobbying efforts between any pair of firms f and g is given by $\frac{\Delta\Pi_g}{\Delta\Pi_f}$

[62] As shown in Section B-1.2 of the Theoretical Appendix, having a large comparative advantage shelters exporting firms from competition effects, increasing the maximum gains they can achieve from an FTA.

for any FTA. Firms' lobbying efforts, however, do depend on the size of the agreement and are determined by the gains of the marginal lobbying firm, i.e. the firm that is exactly indifferent w.r.t. lobbying.[63] We denote these gains by $\Delta\overline{\Pi}$. Then, evaluating (9) at the marginal firm, equation (10) gives firm-level lobbying expenditures:

$$l_f = v'^{-1}\left(\kappa\frac{\Delta\overline{\Pi}}{\Delta\Pi_f}\right), \tag{11}$$

where

$$\kappa\mathbb{E}\left[\frac{B^-}{\left(\sum_{f\in\Omega_L} v\left(v'^{-1}\left(\kappa\frac{\Delta\overline{\Pi}}{\Delta\Pi_f}\right)\right)+\mid B\mid\right)^2}\right]\cdot\mathbb{E}[P^*]\cdot\Delta\overline{\Pi}=1. \tag{12}$$

The above expression implies that, for a given set of lobbying firms Ω_L and expected probability of foreign ratification $\mathbb{E}[P^*]$, an increase in market size of the trading partner raises the return to lobbying for the marginal firm above 1: thus, it has to be that the set of lobbying firms Ω_L broadens to restore the equilibrium. If the marginal firm is smaller, then equation (10) implies that the number of lobbying firms and lobbying expenditures by each lobbying firm increase.[64] All in all, a larger FTA increases firm-level lobbying both at the extensive and at the intensive margin.

Result 3. *The number of pro-FTA firms that lobby is higher the higher the profit gains from the FTA. Furthermore, individual firms spend more supporting FTAs that generate larger gains.*

We next move to the role of political uncertainty. It is straightforward to verify that, if pro-FTA firms knew with certainty that the government is biased in favor of the FTA (i.e. if B could only take positive values), they would never find it profitable to lobby in favor.[65] 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), some pro-FTA firms will always find it profitable to lobby in favor of the agreement, even if $\mathbb{E}[B] > 0$. In particular, we can state the following:

Result 4. *Lobbying expenditures by pro-FTA firms increase with the probability that politicians are against ratifying the agreement.*

In general, a change in the distribution of the political bias will impact the probability of ratification in two ways. It will affect the probability that a government is in favor of or against the FTA, but also 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

[63] We ignore the integer constraint for expositional clarity.

[64] The expected probability of ratification in both countries ($\mathbb{E}[P^*]$ and $\mathbb{E}[P^*]$) also increases in the size of the FTA.

[65] 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).

being negative. In particular, such a change in the distribution will leave unchanged the expected probability that the FTA is ratified (resp. not ratified) conditional upon the bias being negative (resp. positive). This means that, for a given lobbying effort $\mathcal{L}_P$, the expected probability of ratification is impacted only through $\mathbb{P}(B < 0)$ (or equivalently $\mathbb{P}(B \geq 0)$), so that these changes in the distribution of B preserve the conditional expectations of the probability of ratification, allowing us to examine how the direction of the bias alone impacts firm-level lobbying (see Section B-7 in the Theoretical Appendix for details).

Under this distributional shift, an increase in the probability that the Home 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 decomposing the first-order condition as follows:

$$v'(l_f)\left(\mathbb{P}(B>0)+\mathbb{P}(B<0)\mathbb{E}_{B<0}\left[\frac{B^-}{(\mathcal{L}_P+B^-)^2}\right]\right)\mathbb{E}\left[P^*\right]\Delta\Pi_f=1, \tag{13}$$

where we use $\mathbb{E}_{B<0}$ to denote the expected value of a random variable, conditional on the political bias being negative. When the probability that Home politicians are 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 $\mathbb{E}[P^*]$. Thus an increase in the probability that the government is in favor of the agreement leads to a decrease in the equilibrium contributions of pro-FTA firms. Intuitively, when politicians are more likely to be in favor of the agreement, pro-FTA firms tend to free ride on their bias and thus exert less effort. 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 is 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.

4.5 Testable Predictions about 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.

Result 2 leads to the first prediction about cross-firm variation in lobbying expenditures on trade agreements:

P.1: Larger firms should spend more lobbying in favor of an FTA.

The second prediction follows from Result 3 and is about within-firm variation in lobbying expenditures across trade agreements:

P.2: Individual firms should spend more supporting FTAs that generate larger profit gains.

To bring the two predictions above to the data, we will exploit cross-firm variation in size and within-firm variation in the gains from different trade agreements.

Finally, 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 them, 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.

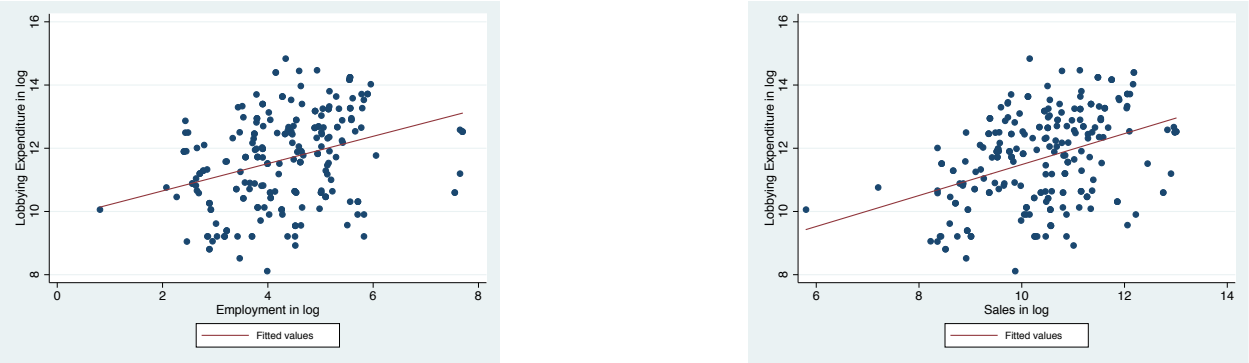
To test this prediction, we will exploit variation in political support for the ratification of trade agreements across US Congresses.

5 Determinants of 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.

We start by prediction P.1, according to which larger firms should spend more lobbying in support of trade agreements. A first look at the data shows that there is indeed a positive correlation between the size of lobbying firms and their expenditures on FTAs (see Figure 3).

Figure 3
Expenditures by lobbying firms



The figure plots the log of *Lobbying expenditure*$_{f,j,a,t}$ against the log of *Employment*$_{f,t}$ and the log of *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 *Lobbying expenditure*$_{f,j,a,t}$ against the log of *Employment*$_{f,t}$ or *Sales*$_{f,t}$.[66] In the first specifications, we only include FTA fixed effects (columns 1-2), while in the

[66] We use the log of (1+ *Lobbying expenditure*$_{f,j,a,t}$) to be able to include zero expenditures on some agreements.

remaining specifications we further include industry fixed effects at the SIC1 level (columns 3-4) and SIC2 level (columns 5-6). We cluster standard errors at the FTA-SIC1 level. As discussed below, the results are robust to alternative clustering.

The results confirm that larger firms spend more lobbying in favor of FTAs. In terms of magnitude, the coefficients reported in columns 5 and 6 of Table 3 indicate that a 1 percent increase in $Employment_{f,t}$ ($Sales_{f,t}$) leads to a 0.4 (0.3) percent increase in firms' lobbying expenditures on FTAs. Put differently, as we move from the 10th percentile to the 90th percentile of log $Employment_{f,t}$ ($Sales_{f,t}$), log $Lobbying\ expenditure_{f,j,a,t}$ increases by around 1.215 (0.909) standard deviations.[67]

Table 3
Lobbying expenditures on FTAs, variation in firm size

	(1)	(2)	(3)	(4)	(5)	(6)
log(Employment$_{f,t}$)	0.285***		0.351***		0.411***	
	(0.0906)		(0.1084)		(0.1191)	
log(Sales$_{f,t}$)		0.257***		0.276**		0.299***
		(0.0968)		(0.1077)		(0.1127)
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
Observations	1,731	1,731	1,731	1,731	1,731	1,731
R^2	0.077	0.076	0.082	0.080	0.099	0.096

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. The variable $Employment_{f,t}$ is the total number of employees of firm f in year t, while $Sales_{f,t}$ is total sales by firm f in year t. Standard errors in parenthesis clustered at the FTA-SIC1 level. Significance levels: *; 10%; **: 5%; ***: 1%.

We next assess the validity of prediction P.2, according to which a firm's lobbying expenditure on an FTA should be proportional to the gains it can derive from the agreement. To verify this, in Table 4 we regress $Lobbying\ expenditure_{f,j,a,t}$ on measures of the firm's potential gains from the FTA. In these regressions, we always include firm fixed effects, exploiting within-firm variation in lobbying expenditures across trade agreements, as a function of pre-agreement tariffs and the size of the FTA partner. Notice that number of observations varies substantially across the specifications of Table 4. This is because, as mentioned before, tariff data are often missing.

[67]The 10th percentile of log $Employment_{f,t}$ is 2.665 and the 90th percentile is 11.685, thus (5.621 - 2.665) $\times$ 0.411=1.215. The 10th percentile of log $Sales_{f,t}$ is 8.645 and the 90th percentile is 11.685, thus (11.685-8.645) $\times$ 0.299=0.909.

Table 4

Lobbying expenditures on FTAs, within-firm variation in expected gains from the agreement

	(1)	(2)	(3)	(4)	(5)	(6)
log(Tariff applied by FTA partners on the final good$_{j,a}$)	0.240**					
	(0.1102)					
log(Tariff applied by US on inputs$_{j,a}$)	3.026***					
	(0.7150)					
log(Tariff applied by US on the final good$_{j,a}$)	-0.163					
	(0.1839)					
log(GDP FTA partner$_a$)		0.308***				
		(0.1128)				
log(Improved access to foreign consumers$_{j,a}$)			0.060**			0.064**
			(0.0237)			(0.0258)
log(Improved access to foreign suppliers$_{j,a}$)				0.086***		0.155**
				(0.0250)		(0.0570)
log(Increased competition in the domestic market$_{j,a}$)					-0.013	-0.064**
					(0.0232)	(0.0279)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	651	1,819	1,151	1,299	892	651
R^2	0.256	0.203	0.205	0.230	0.227	0.258

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. All other variables are constructed using pre-agreement data (for the year of the ratification of agreement a). *Tariff applied by FTA partners on final good*$_{j,a}$ is the tariff applied by the partners of FTA agreement a on imports of good j from the US. *Tariff applied by US on inputs*$_{j,a}$ is the average tariff applied by the US on imports from partners of agreement a of the inputs necessary to make good j. *Tariff applied by US on final good*$_{j,a}$ is the tariff applied by the US on imports of good j from partners of agreement a. *GDP of FTA partners*$_a$ is the GDP of the partner(s) of agreement a. Standard errors in parenthesis clustered at the FTA-SIC1 level. *Improved access to foreign consumers*$_{j,a}$ is defined as the multiplication between *Tariff applied by FTA partners on the final good*$_{j,a}$ and *GDP of FTA partner*$_a$. *Improved access to foreign suppliers*$_{j,a}$ is defined as the multiplication between *Tariff applied by US on inputs*$_{j,a}$ and *GDP of FTA partner*$_a$. *Increased competition in the domestic market*$_{j,a}$ is defined as the multiplication between *Tariff applied by US on the final good*$_{j,a}$ and *GDP of FTA partner*$_a$. Standard errors in parenthesis clustered at the FTA-SIC1 level. Significance levels: *; 10%; **: 5%; ***: 1%.

In column 1 we examine the role of pre-agreement tariffs.[68] As expected, firms' lobbying expenditures on FTAs increase in the initial tariffs they face to export their final goods to the FTA partners (the coefficient of the variable *Tariff applied by FTA partners on final good*$_{j,a}$ is positive and significant). Firms' lobbying expenditures also increase in the initial tariffs they face to import their inputs from FTA partners (the coefficient of the variable *Tariff applied by US on inputs*$_{j,a}$ is positive and significant). The coefficient of the variable *Tariff applied by US on the final good*$_{j,a}$ is negative but not significant. In terms of magnitude, the estimates imply that a 1 percent increase in the export tariff (input tariff) leads to a 0.24 percent increase (3 percent increase) in firms' lobbying expenditures in support of the agreement.

In column 2, we examine the role of the size of the FTA partner. As expected, the coefficient of the variable *log*(*GDP of FTA partner*$_a$) is positive and significant, indicating that firms spend more in support of trade agreements with larger trading partners. In terms of magnitude, the estimate implies that a 1 percent increase in the size of the FTA partner leads to a 0.3 percent increase in lobbying expenditure.

In the remaining specifications of Table 4, we combine information on the level of pre-agreement tariffs and the size of the FTA partner to examine how firms' lobbying expenditure depend on their potential gains (in terms of improved access to consumers and suppliers in the foreign market) and losses (due to increased competition in the domestic market). We first consider each channel in isolation (columns 3-5) and then combine them (column 6). As expected, the coefficient of the variables *Improved access to foreign consumers*$_{j,a}$ and *Improved access to foreign suppliers*$_{j,a}$ are positive and significant, confirming that firms spend more in support of agreements that generate larger market-access gains. The coefficient of the variable *Increased competition in the domestic market*$_{j,a}$ is instead negative (and significant in column 6), implying that increased import competition lowers firms' support for trade agreements. In terms of magnitude, the coefficients in column 6 imply that a 1 percent increase in access to consumers in the foreign market (import competition in the domestic market) leads to a 0.064 percent increase (decrease) in lobbying expenditures, while a 1 percent increase in access to foreign suppliers increases lobbying expenditures by 0.155 percent. Overall, the results of Table 4 confirm that lobbying firms spend more supporting trade agreement that can generate larger profit gains, in line with prediction P.2 of our model.

In Table 5 we examine whether lobbying expenditures on FTAs depend on the depth of the agreements, using the measures by Dür *et al.* (2014) and Hofmann *et al.* (2019). 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 on non-tariff issues (e.g. rules on services, investment, competition, intellectual property rights). This argument is formalized by Antràs and Staiger

[68] As explained in Section 2, the tariff variables are defined as the maximum SIC4 Effectively Applied Tariff. The results of Table 4 are robust to including the other moments of the tariff variables and to using average tariffs.

(2012), who develop a theoretical model showing that in the presence of offshoring of intermediate inputs deep integration is necessary to achieve internationally efficient policies. We would then expect firms to spend more lobbying in favor of trade agreements that cover more provisions that go beyond tariff liberalization. The results of Table 5 confirm that firms spend more in support of deeper trade agreements. This result, however, should be taken with some caution. This is because, as discussed in the conclusion, some of the provisions included in the final text of a trade agreement may be endogenous to firms' lobbying efforts.

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

	(1)	(2)
Depth DESTA$_a$	4.293***	
	(1.4436)	
Depth World Bank$_a$		0.145***
		(0.0420)
Firm FE	Yes	Yes
Year FE	Yes	Yes
Observations	1,730	1,730
R^2	0.227	0.231

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. *Depth DESTA1*$_a$ and *Depth DESTA2*$_a$ measure the depth of agreement a as measured by Dür *et al.* (2014). *Depth World Bank*$_a$ measures the depth of agreement a as measured by Hofmann *et al.* (2019). Standard errors in parenthesis clustered at the FTA-SIC1 level. Significance levels: *; 10%; **: 5%; ***: 1%.

Finally, in Table 6 we assess the validity of the last prediction of our model, according to which pro-FTA firms should spend more lobbying on 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*$_a$ and *Divided Government*$_a$, which capture variation in expected political support for FTA ratification.[69]

In line with prediction P.3, the coefficients of the variable *Share of Democrats in Congress*$_a$ are 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*$_a$ 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.

[69]One may think of using variation in the *outcome* of ratification votes in Congress to proxy for the political bias in favor of 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 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).

Table 6
Lobbying expenditures on FTAs,
variation in expected political bias against ratification

	(1)	(2)	(3)	(4)
Share of Democrats in Congress1$_a$	11.567**			
	(5.4494)			
Share of Democrats in Congress2$_a$		12.462**		
		(5.3416)		
Divided Government1$_a$			1.347***	
			(0.2686)	
Divided Government2$_a$				1.615***
				(0.4022)
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
N	1,821	1,821	1,821	1,821
R^2	0.104	0.097	0.083	0.084

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. *Share of Democrats in Congress1*$_a$ (*Share of Democrats in Congress2*$_a$) measures the share of congressmen belonging to the Democratic party (including independent congressmen who caucus with the Democrats) in the year of the ratification of agreement a. *Divided Government1*$_a$ (*Divided Government2*$_a$) is a dummy variable equal to 1 if, in the year of the ratification of agreement a, 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 FTA-SIC1 level. Significance levels: *; 10%; **: 5%; ***: 1%.

We have performed a series of additional estimations to verify the robustness of the results on firms' lobbying expenditures on trade agreements. Our model suggests that the effects of a trade agreement on firms' payoffs – and thus on their incentives to lobby – should be heterogeneous across FTAs and sectors, depending on the size of the the initial tariffs on final and intermediate goods. For this reason, in Tables 3-6, we have clustered standard errors at the FTA-SIC1 level. We have verified that the results continue to hold if we cluster standard errors at the FTA level or at sectoral (SIC1 or SIC2) level.[70] We have also explored another intensive margin of lobbying, i.e. the number of reports filed by firms. Once again, the results support predictions P.1-P.3: larger firms lobby more often, i.e. file more reports on the same FTA (see Table A-4); individual firms file more reports when they have more to gain from the agreement (see Tables A-5 -A-6) and when US legislators are less likely to be in favor of their ratification (see Table A-7).

[70]The results of these regressions are available upon request.

6 Conclusion

Recent decades have seen a surge in the number of FTAs. This paper shows that the politics of FTAs is dominated by large companies that benefit from these trade agreements.

Exploiting detailed information from lobbying reports filed under the Lobbying Disclosure Act, we have constructed a unique dataset allowing us to trace all firms' lobbying expenditures in favor of or against FTAs negotiated by the United States. Using this dataset, we show that lobbying on trade agreements is a rare event and is dominated by pro-FTA firms: in over 99% of the cases, lobbying firms are in favor of the ratification of trade agreements. This fact holds for all trade agreements negotiated by the United States – including TPP, which did not reach the ratification phase. We also find that, relative to non-lobbying firms, lobbying firms are larger, more likely to be engaged in international trade, and to operate in comparative advantage sectors.

These findings support Rodrik (2018)'s view that "trade agreements are shaped largely by rent-seeking, self-interested behavior of politically well-connected firms on the export side." They are also in line with studies focused on unilateral and sector-specific trade policies, which show that large firms lobby in favor of tariff reductions (e.g. Blanchard and Matschke, 2015; Mayda *et al.*, 2018) and resonate with arguments by political scientists, who emphasize that large pro-trade firms play an outsized role in trade politics (e.g. Osgood, 2017 and 2020; Kim, 2017).

Previous models of the political economy of FTAs (e.g. Grossman and Helpman, 1995; Krishna, 1998; Ornelas, 2005) do not feature firm heterogeneity and thus cannot explain why a few large pro-FTA companies dominate the politics of trade agreements. We develop a new model in which heterogeneous firms choose whether to be politically organized and how much to spend lobbying in favor of or against the ratification of a proposed FTA. In terms of market structure, we examine first the distributional effects of the FTA in the canonical model of firm heterogeneity under monopolistic competition (Melitz, 2003), before extending the analysis to models with heterogeneous oligopolistic firms. The political structure of the model builds on the literature on lobbying/rent-seeking in contests (e.g. Tullock, 1980; Becker, 1983; Esteban and Ray, 2001; Siegel, 2009) and features selection into lobbying and political uncertainty.

In this model, the biggest winners from the FTA have higher stakes in the agreement than the biggest losers. When this difference is large enough, only pro-FTA have incentives to be politically organized and there is a unique equilibrium in which only the largest exporters select into lobbying. Our model can thus explain why only a few large firms are politically organized and always support FTA ratification.

The model also delivers predictions on the intensive margin of lobbying. In line with these predictions, we find that larger firms spend more supporting trade agreements. Moreover, individual firms spend more when their potential gains from the agreement are larger – in terms of improved access to consumers and suppliers in the foreign market – and when legislators are less likely to be

in favor of 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 signed by the executive, so firms can only affect legislators' decisions on their ratification. 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 shape the content of trade agreements. For example, one could examine whether lobbying firms are able to influence the length of the tariff phase-out periods or the rules of origin (RoO) contained in FTAs.[71] It would also be interesting to study lobbying on other provisions included in trade agreements. Maggi and Ossa (2020) develop a model of the political economy of deep trade agreement in which industries lobby on product and process standards. In ongoing work, we examine whether firms can shape provisions on non-trade issues, e.g. rules on intellectual property rights and investment (Blanga-Gubbay *et al.*, 2020).[72]

Our analysis shows that lobbying on FTAs is dominated by a few large companies that gain from these agreements. As pointed out by Osgood (2016) "opposition to trade among non-producers – especially certain unions, progressive organizations, and segments of the public – remains an important force, albeit one weakened by the lack of effective producer-led opposition." Blanga-Gubbay (2020) shows that lobbying against FTAs is dominated by large unions in tradable sectors, though their lobbying expenditures are dwarfed by the amounts spent by large corporations in support of these agreements (see also Figure A-2). The fact that the losers had little voice in the politics of FTAs might help to explain the recent backlash against trade agreements witnessed in recent years.

[71] This would require collecting detailed information on the RoO contained in each agreement, as done by Conconi *et al.* (2018) for NAFTA. There is some evidence that, during the negotiations of this agreement, firms that were 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).

[72] Anecdotal evidence suggests that large corporations are able to "buy" favorable provisions in trade agreements. 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).

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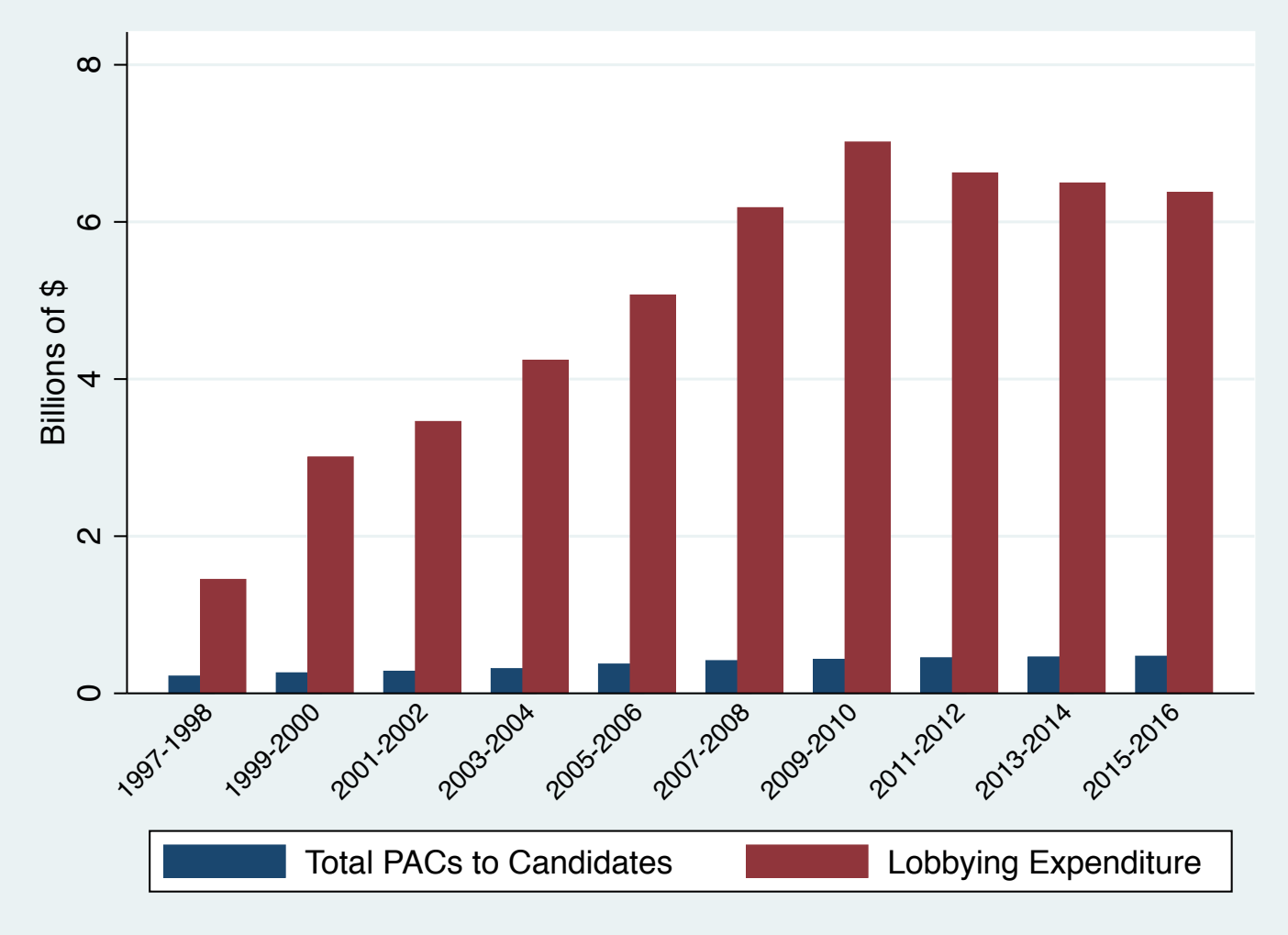
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A. Empirical Appendix

A-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 105^{th} Congress (1997-1998) and the 114^{th} Congress (2015-2016). The data come from the Center for Responsive Politics (see `http://www.OpenSecrets.org`).

Table A-1

Ratification bills of FTAs negotiated by the US since the passage of the Lobbying Disclosure Act

FTA partner	**Date of entry Into Force**	**Votes in the House**		**Votes in the Senate**	
		Bill Number	**Date**	**Bill Number**	**Date**
Jordan	December 17, 2001	H.R.2603	July 31, 2001	S. 643	Sept. 24, 2001
Chile	January 1, 2004	H.R.2738	July 24, 2003	S. 1416	July 31, 2003
Singapore	January 1, 2004	H.R.2739	July 24, 2003	S. 1417	July 31, 2003
Australia	January 1, 2005	H.R.4759	July 14, 2004	S. 2610	July 15, 2004
Morocco	January 1, 2006	H.R.4842	July 22, 2004	S. 2677	July 21, 2004
Bahrain	January 11, 2006	H.R.4340	Dec. 7, 2005	S. 2027	Dec. 13, 2005
CAFTA-DR (El Salvador)	March 1, 2006	H.R.3045	July 28, 2005	S. 1307	July 28, 2005
CAFTA-DR (Honduras)	April 1, 2006				
CAFTA-DR (Nicaragua)	April 1, 2006				
CAFTA-DR (Guatemala)	July 1, 2006				
CAFTA-DR (Dominican Rep.)	March 1, 2007				
CAFTA-DR (Costa Rica)	Jan. 1, 2009				
Oman	Jan. 1, 2009	H.R.5684	July 20, 2006	S. 3569	Sept. 19, 2006
Peru	Feb. 1, 2009	H.R.3688	Nov. 8, 2007	S. 2113	Dec. 4, 2007
Colombia (1)	-	H.R.5724	-	S. 2830	-
Korea	March 15, 2012	H.R.3080	Oct. 12, 2011	S. 1642	Oct. 12, 2011
Colombia (2)	May 15, 2012	H.R.3078	Oct. 12, 2011	S. 1641	Oct. 12, 2011
Panama	October 31, 2012	H.R.3079	Oct. 12, 2011	S. 1643	Oct. 12, 2011

Table A-2
Descriptive statistics on firms lobbying on FTA ratification bills

	Observations	Mean
Lobbying expenditure$_{f,a}$	277	290,555
Number of reports$_{f,a}$	277	2.899
Firms lobbying directly$_{f,a}$	193	70.44%
Firms lobbying indirectly$_{f,a}$	63	22.99%
Firms lobbying directly and indirectly$_{f,a}$	18	6.57%

The variable *Lobbying expenditure*$_{f,a}$ is the total amount (in US dollars) spent by firm f to lobby in support of the ratification of agreement a. *Number of Reports*$_{f,a}$ is the number of reports filed by 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-3
Descriptive statistics, lobbying vs. non-lobbying firms

	Lobbying Firms				
	Observations	Mean	Std. Dev.	Min	Max
Employment$_{f,t}$	251	159.383	339.660	1.252	2,200
Sales$_{f,t}$	257	63,244.38	86,975.4	329.77	444,948
Tradable sector$_j$	239	0.678	0.468	0	1
Exporter and/or importer$_{f,t}$	140	0.9928	0.0845	0	1

	Non-Lobbying Firms				
	Observations	Mean	Std. Dev.	Min	Max
Employment$_{f,t}$	87,296	8.450	36.984	0	2,545
Sales$_{f,t}$	95,275	2,693.97	12,742.31	-15,009.33	470,171
Exporter and/or importer$_{f,t}$	21,639	0.7803	0.0845	0	1
Tradable sector$_j$	105,997	0.406	0.491	0	1

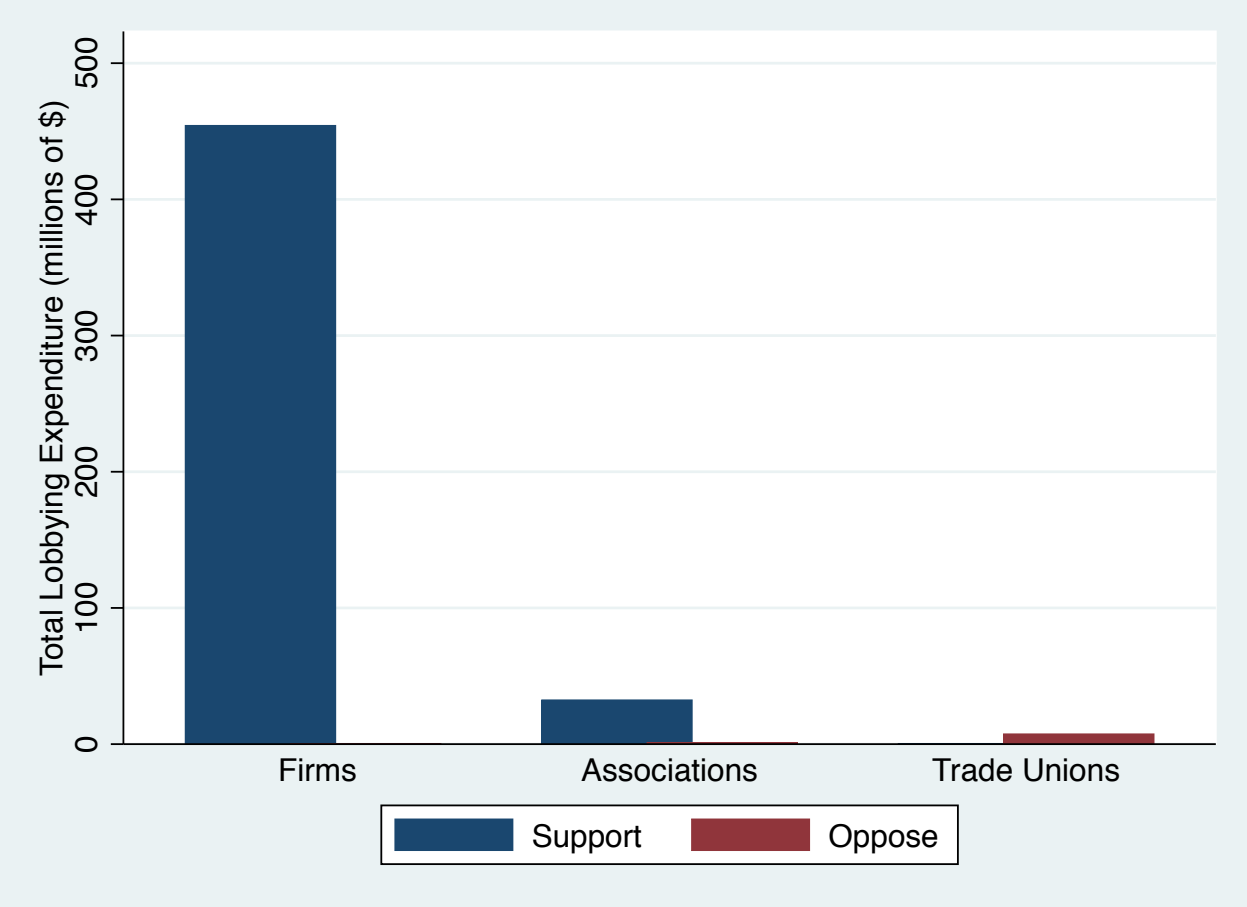
Employment$_{f,t}$ is the total number of employees (in thousands) of firm f in year t. *Sales*$_{f,t}$ is total sales (in millions of US dollars) by firm f in year t. *Exporter and/or importer*$_{f,t}$ is a dummy variable equal to 1 if firm f exports and/or imports in year t. *Tradable sector*$_j$ is a dummy equal to 1 the firm operates in a sector j classified as tradable.

Table A-4
Descriptive statistics, FTA variables

	Observations	Mean	Std. Dev.	Min	Max
Lobbying expenditure$_{f,a}$	259	283,207.5	397,399.8	3,333.3	2,770,000
RCA$_{j,a}$	159	1472.893	17163.12	0.004	216470.4
Tariff applied by FTA partner on the final good$_{j,a}$	163	33.40	124.32	0	800.3
Tariff applied by US on inputs$_{j,a}$	155	0.145	0.51	0	3.94
Tariff applied by US on inputs$_{j,a}$ (unweighted)	155	3.31	9.70	0	70.83
Tariff applied by US on the final good$_{j,a}$	145	2.71	7.99	0	48.00
GDP of FTA partner$_a$	255	319,990	374,213.2	14,339.97	1,134,795
Improved access to foreign consumers$_{j,a}$	163	25,479,120	140,492,200	0	908,176,800
Improved access to foreign suppliers$_{j,a}$	155	56,053.73	140,767.80	0	988,472.80
Increased competition in the domestic market$_{j,a}$	145	1,510,635	5,653,029	0	54,470,180
Depth DESTA$_a$	224	2.073	0.120	1.223	2.170
Depth World Bank$_a$	224	59.870	4.474	28	63
Share of Democrats in Congress1$_a$	256	0.479	0.033	0.456	0.533
Share of Democrats in Congress2$_a$	256	0.482	0.033	0.460	0.537
Divided Government1$_a$	256	0.699	0.460	0	1
Divided Government2$_a$	256	0.270	0.445	0	1

The variable *Lobbying expenditure*$_{f,a}$ is the total amount (in US dollars) spent by firm f in support of the ratification of agreement a. All the FTA variables are constructed using pre-agreement data, for the year of the ratification of agreement a (with the exception of the depth measures, which are time invariant). $RCA_{j,a}$ measures the extent to which the United States has a revealed comparative advantage in sector isj relative to the FTA partner(s) of agreement a. *Tariff applied by FTA partners on the final good*$_{j,a}$ is the maximum SIC4 tariff applied by the partners of agreement a on imports of good j from the US in the year of the ratification of agreement a. *Tariff applied by US on inputs*$_{j,a}$ 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 (with the IO coefficients used as weights). *Tariff applied by US on inputs*$_{j,a}$ *(unweighted)* 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. *Tariff applied by US on the final good*$_{j,a}$ is the maximum SIC4 tariff applied by the US on imports of good j from the partners of agreement a. *GDP of FTA partner*$_a$ is the GDP of the partner(s) of agreement a (in millions of US dollars). *Improved access to foreign consumers*$_{j,a}$ is defined as the multiplication between *Tariff applied by FTA partners on the final good*$_{j,a}$ and *GDP of FTA partner*$_a$. *Improved access to foreign suppliers*$_{j,a}$ is defined as the multiplication between *Tariff applied by US on inputs*$_{j,a}$ and *GDP of FTA partner*$_a$. *Increased competition in the domestic market*$_{j,a}$ is defined as the multiplication between *Tariff applied by US on the final good*$_{j,a}$ and *GDP of FTA partner*$_a$. *Depth DESTA*$_a$ and *Depth World Bank*$_a$ capture the depth of agreement a as measured by Dür *et al.* (2014) and Hofmann *et al.* (2019), respectively. *Share of Democrats in Congress1*$_a$ (*Share of Democrats in Congress2*$_a$) measures the share of congressmen belonging to the Democratic party (including independent congressmen who caucus with the Democrats) in the year of the ratification of agreement a. *Divided Government1*$_a$ (*Divided Government2*$_a$) is a dummy variable equal to 1 if, in the year of the ratification of agreement a, one party controls the executive branch, while the other party controls at least one of the houses (both houses) of the legislative branch.

Figure A-2
Lobbying expenditures on FTA ratification bills



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-3
Lobbying Report (Example 1)

Clerk of the House of Representatives	Secretary of the Senate
Legislative Resource Center	Office of Public Records
B-106 Cannon Building	232 Hart Building
Washington, DC 20515	Washington, DC 20510

Secretary of the Senate
Received: Feb 13, 2006

LOBBYING REPORT

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

1. Registrant Name:

MILLER BREWING COMPANY

2. Address:
655 15TH STREET, N.W., SUITE 385, WASHINGTON, DC 20005

3. Principal place of business (if different from line 2):
City: MILWAUKEE State/Zip(or Country): WI 53208

4. Contact Name: TIMOTHY H. SCULLY, JR.
Telephone: 202-661-8630
E-mail (optional): scully.timothy@mbco.com

Senate ID #: 78994-12
House ID #: 36209000

7. Client Name: ☒ Self

TYPE OF REPORT

8. Year 2005 Midyear (January 1 - June 30): ☐ **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: 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: ☒ => Expenses (nearest $20,000): 374,131.00

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
☐ **Method C.** Reporting amounts under section 162(e) of the Internal Revenue Code

Registrant Name: MILLER BREWING COMPANY 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: TRD (one per page)

16. Specific lobbying issues:

Support S. 1307 (To implement the Dominican Republic-Central America-U.S. Free Trade Agreement Implementation Act) Support H.R. 3045 (To implement the Dominican Republic-Central America-U.S. Free Trade Agreement Implementation Act)

Figure A-4
Lobbying Report (Example 2)

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

LOBBYING REPORT

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

1. Registrant Name ☑ Organization/Lobbying Firm ☐ Self Employed Individual
PMI Global Services Inc.

2. Address
Address1 700 13th Street, NW Address2 Suite 325
City Washington State DC Zip Code 20005 Country USA

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

4a. Contact Name	b. Telephone Number	c. E-mail	5. Senate ID#
Ms. Beverly McKittrick	2024952661	beverly.mckittrick@pmintl.com	400265213-12

7. Client Name ☑ *Self* ☐ *Check if client is a state or local government or instrumentality*
PMI Global Services Inc.

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 ☐ Termination Date _____ 11. No Lobbying Issue Activity ☐

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

12. Lobbying

INCOME relating to lobbying activities for this reporting period was:

Less than $5,000 ☐

$5,000 or more ☐ $ _____

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-5
Lobbying Report (Example 3)

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

LOBBYING REPORT

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

1. Registrant Name ☑ Organization/Lobbying Firm ☐ Self Employed Individual
THE LAURIN BAKER GROUP, LLC

2. Address
Address1 3600 S. Glebe Road Address2 #620
City Arlington State VA Zip Code 22202 Country USA

3. Principal place of business (if different than line 2)
City Washington State DC Zip Code 20001 Country USA

4a. Contact Name	b. Telephone Number	c. E-mail	5. Senate ID#
Mrs. Jennifer Baker Reid	2023938524	jreid@thelaurinbakergroup.com	44914-152

7. Client Name ☐ *Self* ☐ *Check if client is a state or local government or instrumentality*
Masco Corporation

6. House ID# 342290009

TYPE OF REPORT

8. Year 2011 Q1 (1/1 - 3/31) ☐ Q2 (4/1 - 6/30) ☐ Q3 (7/1 - 9/30) ☑ Q4 (10/1 - 12/31) ☐

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

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

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

12. Lobbying

INCOME relating to lobbying activities for this reporting period was:

Less than $5,000 ☐

$5,000 or more ☑ $ 20,000.00

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

13. Organizations

EXPENSE relating to lobbying activities for this reporting period were:

Less than $5,000 ☐

$5,000 or more ☐ $ _____

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

☐ **Method A.** Reporting amounts using LDA definitions only

☐ **Method B.** Reporting amounts under section 6033(b)(8) of the Internal Revenue Code

☐ **Method C.** Reporting amounts under section 162(e) of the Internal Revenue Code

Signature Digitally Signed By: Jennifer Baker Reid, Vice President and Partner **Date** 10/19/2011

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

Lobbied in support of the Korea-US Free Trade Agreement (HR3080/S1642).

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

U.S. HOUSE OF REPRESENTATIVES

Figure A-6
Lobbying Report (Example 4)

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

LOBBYING REPORT

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

1. Registrant Name ☑ Organization/Lobbying Firm ☐ Self Employed Individual
UNITED STATES STEEL CORPORATION

2. Address
Address1 901 K Street, NW Address2 Suite 1250
City WASHINGTON State DC Zip Code 20001 Country USA

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

4a. Contact Name	b. Telephone Number	c. E-mail	5. Senate ID#
Mr. Thomas M. Sneeringer	2027836333	jwlindsey@uss.com	71553-12

7. Client Name ☑ *Self* ☐ *Check if client is a state or local government or instrumentality*
UNITED STATES STEEL CORPORATION

6. House ID# 358040000

TYPE OF REPORT

8. Year 2011 Q1 (1/1 - 3/31) ☐ Q2 (4/1 - 6/30) ☐ Q3 (7/1 - 9/30) ☑ Q4 (10/1 - 12/31) ☐

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

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

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

12. Lobbying

INCOME relating to lobbying activities for this reporting period was:

Less than $5,000 ☐

$5,000 or more ☐ $ _____

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 ☑ $ 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 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: Thomas M. Sneeringer, 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.639, Currency Reform for Fair Trade Act
S.328, Currency Reform for Fair Trade Act
H.R.1239, Congressional Made in America Promise Act of 2011
S.1, American Competitiveness Act
S.1133/H.R.3057, Enforcing Orders and Reducing Customs Evasion Act of 2011, entire bill.

S.1619, Currency Exchange Rate Oversight Reform Act, entire bill

H.R.3080, 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

Figure A-7
Lobbying Report (Example 5)

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

LOBBYING REPORT

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

1. Registrant Name ☑ Organization/Lobbying Firm ☐ Self Employed Individual
QUALCOMM, INCORPORATED

2. Address
Address1 1730 PENNSYLVANIA AVE, NW Address2 SUITE 850
City WASHINGTON State DC Zip Code 20006 Country USA

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

4a. Contact Name	b. Telephone Number	c. E-mail	5. Senate ID#
Mrs. Alice Tornquist	2022630024	alicet@qualcomm.com	60674-12

7. Client Name ☑ *Self* ☐ *Check if client is a state or local government or instrumentality*
QUALCOMM, INCORPORATED
6. House ID# 353580000

TYPE OF REPORT

8. Year 2016 Q1 (1/1 - 3/31) ☑ Q2 (4/1 - 6/30) ☐ Q3 (7/1 - 9/30) ☐ Q4 (10/1 - 12/31) ☐
9. Check if this filing amends a previously filed version of this report ☐
10. Check if this is a Termination Report ☐ Termination Date _____ 11. No Lobbying Issue Activity ☐

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

12. Lobbying

INCOME relating to lobbying activities for this reporting period was:

Less than $5,000 ☐

$5,000 or more ☐ $ _____

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 ☑ $ 1,730,000.00

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: Alice Tornquist **Date** 4/20/2016 12:43:16 PM

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

15. General issue area code TRD

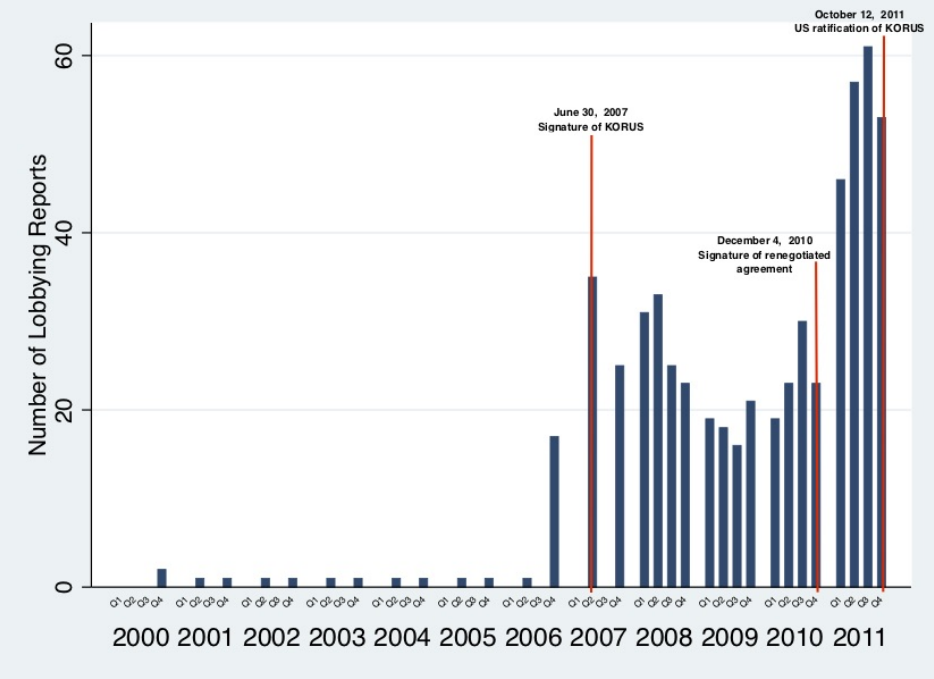
16. Specific lobbying issues

Support for Trans Pacific Partnership

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

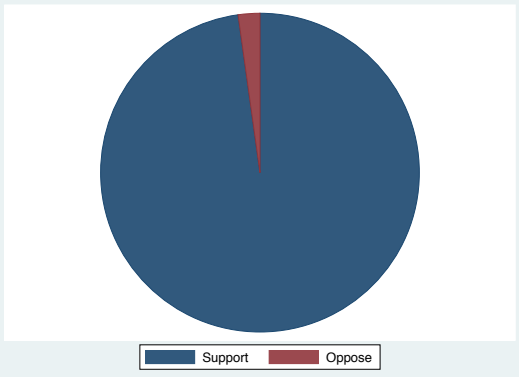
U.S. SENATE, U.S. HOUSE OF REPRESENTATIVES

Figure A-8
Lobbying reports on US-Korea FTA



The figure reports the number of lobbying reports filed by firms during the 2000-2011 period related to the US-Korea FTA.

Figure A-9
Firms' position on the US-Korea FTA (based on keywords)



The figure reports she share of observations in which firms lobbied in favor of or against the US-Korea FTA, based on all lobbying reports related to the agreement filed by firms during the 2000-2011 period.

2 Robustness Checks

Table A-4
Number of reports on FTAs, variation in firm size

	(1)	(2)	(3)	(4)	(5)	(6)
log (Employment$_{f,t}$)	0.042***		0.053***		0.058***	
	(0.0153)		(0.0186)		(0.0198)	
log (Sales$_{f,t}$)		0.035**		0.039**		0.040**
		(0.0167)		(0.0184)		(0.0201)
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
Observations	1,731	1,731	1,731	1,731	1,731	1,731
R^2	0.074	0.075	0.079	0.080	0.099	0.101

The table reports the coefficients of OLS regressions. The dependent variable is the log of $Reports_{f,ja,t}$, the number of reports filed by firm f producing good j in year t to lobby in support of the ratification of agreement a. The variable $Employment_{f,t}$ is the total number of employees of firm f in year t, while $Sales_{f,t}$ is total sales by firm f in year t. Standard errors in parenthesis clustered at the FTA-SIC1 level. Significance levels: *; 10%; **: 5%; ***: 1%.

Table A-5

Number of reports on FTAs, within-firm variation in expected gains from the agreement

	(1)	(2)	(3)	(4)	(5)	(6)
log(Tariff applied by FTA partners on the final good$_{j,a}$)	0.038*					
	(0.0206)					
log(Tariff applied by US on inputs$_{j,a}$)	0.588***					
	(0.1369)					
log(Tariff applied by US on the final good$_{j,a}$)	-0.029					
	(0.0293)					
log(GDP FTA partner$_a$)		0.049**				
		(0.0202)				
log(Improved access to foreign consumers$_{j,a}$)			0.009**			0.010**
			(0.0041)			(0.0044)
log(Improved access to foreign suppliers$_{j,a}$)				0.012***		0.023**
				(0.0042)		(0.0106)
log(Increased competition in the domestic market$_{j,a}$)					-0.002	-0.009**
					(0.0036)	(0.0042)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	651	1,819	1,151	1,299	892	651
R^2	0.236	0.176	0.188	0.203	0.213	0.231

The table reports the coefficients of OLS regressions. The dependent variable *Reports*$_{f,j,a,t}$, is the number of reports filed by firm f producing good j in year t to lobby in support of the ratification of agreement a. The tariff variables are constructed using pre-agreement data (for the year of the ratification of agreement a). *Tariff applied by FTA partners on final good*$_{j,a}$ is the tariff applied by the partners of FTA agreement a on imports of good j from the US. *Tariff applied by US on inputs*$_{j,a}$ is the average tariff applied by the US on imports from partners of agreement a of the inputs necessary to make good j. *Tariff applied by US on final good*$_{j,a}$ is the tariff applied by the US on imports of good j from partners of agreement a. *GDP of FTA partners*$_a$ is the GDP of the partner(s) of agreement a. Standard errors in parenthesis clustered at the FTA-SIC1 level. *Improved access to foreign consumers*$_{j,a}$ is defined as the multiplication between *Tariff applied by FTA partners on the final good*$_{j,a}$ and *GDP of FTA partner*$_a$. *Improved access to foreign suppliers*$_{j,a}$ is defined as the multiplication between *Tariff applied by US on inputs*$_{j,a}$ and *GDP of FTA partner*$_a$. *Increased competition in the domestic market*$_{j,a}$ is defined as the multiplication between *Tariff applied by US on the final good*$_{j,a}$ and *GDP of FTA partner*$_a$. Standard errors in parenthesis clustered at the FTA-SIC1 level. Significance levels: *; 10%; **: 5%; ***: 1%.

Table A-6
Number of reports on FTAs, variation in the depth of the agreements

	(1)	(2)
Depth DESTA$_a$	0.615**	
	(0.2373)	
Depth World Bank$_a$		0.021***
		(0.0069)
Firm FE	Yes	Yes
Year FE	Yes	Yes
Observations	1,730	1,730
R^2	0.202	0.205

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. *Depth DESTA*$_a$ and *Depth World Bank*$_a$ capture the depth of agreement a as measured by Dür *et al.* (2014) and Hofmann *et al.* (2019), respectively. Standard errors in parenthesis clustered at the FTA-SIC1 level. Significance levels: *; 10%; **: 5%; ***: 1%.

Table A-7
Number of reports on FTAs,
variation in expected political bias against ratification

	(1)	(2)	(3)	(4)
Share of Democrats in Congress1$_a$	2.606**			
	(1.1896)			
Share of Democrats in Congress2$_a$		2.733**		
		(1.1795)		
Divided Government1$_a$			0.214***	
			(0.0470)	
Divided Government2$_a$				0.303***
				(0.0922)
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observatiobs	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 $Reports_{f,j,a,t}$, the number of reports filed by firm f producing good j in year t to lobby in support of the ratification of agreement a. *Share of Democrats in Congress1*$_a$ (*Share of Democrats in Congress2*$_t$) measures the share of congressmen belonging to the Democratic party (including independent congressmen who caucus with the Democrats) in year t (the year in which US congressmen have voted on the ratification of agreement a). *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 FTA-SIC1 level. Significance levels: *; 10%; **: 5%; ***: 1%.

B. Theoretical Appendix

B-1 Oligopolistic Market Structures

In this first section of the Theoretical Appendix, we show that the key insights of the Melitz (2003) model concerning the distributional effects of an FTA can continue to hold in a setting in which firms have mass and can thus affect both market and policy outcomes. Specifically, we describe two models with heterogeneous oligopolistic firms, in which the profits of exporting firms are supermodular in productivity and market access (equation (3) holds) and in which the biggest winners from the FTA have higher stakes in the agreement than the biggest losers.

As in the benchmark economic structure described in Section 4, we examine the distributional effects of an FTA between two symmetric countries, Home and Foreign. The economy involves a numeraire good produced under constant returns to scale and perfect competition and $1, \ldots, J$ goods produced by heterogeneous oligopolistic firms.[73]

B-1.1 Mixed Market Structure

We first consider a mixed market structure, in which a few large (oligopolistic) firms coexist with a continuum of small (monopolistically competitive) firms. This market structure is characterized by two 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. Second, the fringe of monopolistically competitive firms absorbs the impact of FTAs on competition.

As in the benchmark model, we consider the case of symmetric non-numeraire sectors and drop the sectoral subscript. This allows us to focus on the role of within-sector productivity differences and intra-industry trade. The implications of allowing for cross-country productivity differences and inter-industry trade are discussed in the next section.

There are N large firms with a unitary mass and a continuum of small, monopolistically competitive firms M, so that the (weighted) mass of varieties is $\mid V \mid \equiv N + M$. 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.[74] Firm i faces a linear inverse demand:[75]

$$p_i = \alpha - \beta x_i - X, \tag{14}$$

[73] We depart from models of oligopolistic competition with a continuum of sectors (e.g. 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.

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

[75] We depart from the baseline model described in Section 4 by assuming linear demand. This is to guarantee that the supermodularity property (equation (3)) holds. As mentioned before, this is not always the case in oligopolistic settings with firm heterogeneity and CES demand (see Nocke and Shutz, 2018).

where

$$\int_V x_i di = \sum_{i=1}^{N} x_i + \int_0^M x_m dm.$$

Large firms may differ in their productivity $\varphi_i \geq \varphi$ where φ is the productivity of small firms. Firms pay a fixed production cost F_D for their product. This cost is negligible for large firms (i.e. of mass zero in their overall cost) reflecting their economies of scope. Following Brander and Krugman, firms are quantity-setters and compete à la Cournot in each segmented market .[76] Firms in one country can serve consumers in the other country, by incurring fixed cost F_X and per-unit tariffs t to export. There are increasing returns to scope associated with exporting: only large firms, for which these costs are negligible (i.e., mass zero in their overall cost), may find it profitable to export. Moreover, among these large firms, only the most productive ones – those whose marginal costs falls below the choke-price – will end-up exporting.

Large and small firms set the price of their goods to maximize their profits, respectively given by

$$\Pi_i = (p_i - \varphi_i^{-1})q_i + (p_i^* - \varphi_i^{-1})q_i^*$$

and

$$\pi_m = (p_m - \varphi^{-1})q_m - F_D.$$

where p_i^* denotes the producer price and q_i^* the foreign demand at the consumer price $p_i^* + t$.

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

$$p_m - \varphi^{-1} = \frac{1}{2}(\alpha - X - \varphi^{-1}).$$

Large firms internalize their impact on X_j, setting their prices in the two markets to

$$p_i - \varphi_i^{-1} = \frac{1}{2}(\alpha + x_i - X - \varphi_i^{-1})$$

and

$$p_i^* - \varphi_i^{-1} = \frac{1}{2}(\alpha + x_i - X - \varphi_i^{-1} - t).$$

Note that, even if all firms had the same productivity (i.e. $\varphi_i = \varphi$), large firms would set a higher price, generating more value-added per output. This is because large firms can afford setting higher markups because they have non-negligible market shares.

Large firms make strictly positive profits

$$\Pi_i \equiv \left(\frac{1}{2\beta + 1}\right)^2 \left(\alpha - \varphi_i^{-1} - X\right)^2,$$

[76] The same results hold if firms compete in prices rather than quantities, as the game remains aggregative in firms' strategic variables (i.e. prices).

while small firms' equilibrium profits are driven down to zero by the free-entry condition:

$$\pi_m = \left(p_m - \varphi^{-1}\right) x_m - F_D = 0. \tag{15}$$

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 aggregate consumption:

$$X = \frac{\alpha - \varphi^{-1} - \sqrt{4\beta F_D}}{2}. \tag{16}$$

In this setting, the reciprocal elimination of tariffs following an FTA always benefits large firms: their domestic profits are unaffected by the increase in competition, while their foreign profits increase. Large firms are thus always in favor of the trade agreement. By contrast, small firms are unaffected by the FTA, given that they always make zero profits (whether they operate or exit the market).[77] In this setting, equation (3) holds, i.e. a reduction in the tariff t benefits more firms with a higher productivity:

$$\frac{d^2\Pi_i}{dtd[\varphi_i^{-1}]} = 2\left(\frac{1}{2\beta+1}\right)^2 > 0. \tag{17}$$

To summarize, under a mixed market structure, the existence of a fringe of monopolistically competitive firms absorbs the effects of the FTA on competition. As a result, oligopolistic firms always gain from trade agreements (their domestic profits are unaffected and their foreign profits increase), with the largest/more productive among them making the largest gains. By contrast, monopolistically competitive firms are indifferent about the FTA, since their expected profits are always equal to zero.

B-1.2 Pure Oligopoly

We next consider a model of pure heterogeneous oligopolistic firms (with no monopolistically competitive fringe) and endogenous entry. We relax the assumption of symmetry across non-numeraire sectors to emphasize the role of cross-country differences in technology.

Consumer-utility maximization leads to a linear inverse demand for each good $j \geq 1$: $p(Q_j) = \max\{\alpha - Q_j, 0\}$.

In each sector j, there is an arbitrary large number of potential entrants indexed by i in both countries. We assume that the distribution of marginal costs in sector j has a support $[c_{j1}, \infty)$ in Home and $[c_{j1}^*, \infty)$ in Foreign. Firm 1 with marginal cost c_{j1} (resp. c_{j1}^*) is the most productive firm (the "technological leader") in Home (resp. Foreign).

Productivity differences across countries are captured by $\lambda_j \equiv c_{j1} - c_{j1}^*$, the marginal cost gap between the leader in Home and Foreign. Home has a comparative advantage in sectors $1 \ldots J/2$ (i.e. $\lambda_j \geq 0$), while Foreign has a comparative advantage in the remaining $J/2+1 \ldots J$ (i.e. $\lambda_j \leq 0$).

[77] We could easily generate losses from the FTA for small firms by introducing fixed exit costs.

We assume that the world technological frontier (the marginal cost of the most productive firm in Home and Foreign) is the same across sectors $min(c_{j1}, c^*_{j1}) = c_1, \forall j$. To derive firm-level predictions about the distributional effects of an FTA, we use a deterministic distribution of productivity.[78] In particular, we assume a constant gap $\delta_j > 0$ in the marginal cost of firm i_{th} and $i_{th} + 1$ within an industry, i.e. $c_{ji} = c_{j1} + (i-1)\,\delta$.[79]

Firms compete à la Cournot in segmented markets, i.e. 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 in Home and Foreign, 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 t^*_j (resp. t_j). Consequently, for a Home firm with technology c_{ji}, producing for the foreign market implies an augmented marginal cost of $c_{ji} + t^*_j$.

In this setting, any equilibrium will feature perfect sorting of firms along their marginal costs. As shown below, only the most productive firms will operate domestically and serve the foreign market, even in the absence of fixed costs of production and exporting, as in other models with choke prices (e.g. Melitz and Ottaviano, 2008).

B-1.2.1 Closed Economy

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

Under Cournot competition and linear demand, total output in Home in sector j is equal to

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

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

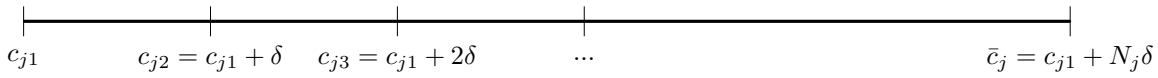
$$\frac{\alpha - c_{j1}}{\delta} = \left(\frac{N_j + 3}{2}\right) N_j. \tag{18}$$

Figure B-2 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 (with marginal cost $\bar{c}_j$).

[78] We could assume that productivities are random draws from a (Pareto or log-normal) distribution, as in standard models of trade with heterogeneous firms. However, with a discrete number of firms, the equilibrium productivity distribution would then be random, so we could not study the effects of the FTA at the firm level.

[79] With a constant marginal cost gap between firms, the productivity approximates a Pareto distribution when the number of firms operating in a sector is large.

Figure B-2
Distribution of Marginal Costs of Home Firms



Equilibrium profits of each firm i are given by

$$\Pi_{ji} = \frac{1}{2}(\bar{c}_j - c_{ji})^2. \tag{19}$$

We can examine the effects of an exogenous technological shock. A decrease in c_{j1}, the marginal cost of the firm at the technological frontier, shifts the entire distribution of marginal costs to the left. This leads to an increase in the number of firms operating in the sector.[80] Each firm in the new equilibrium is more productive and makes higher profits.[81] Thus, in sectors where the technological leader is more productive, the i^{th} firm is also more profitable.

B-1.2.2 Open Economy

We now move to the case of non-prohibitive tariffs, looking first at a sectors in which the productivity distribution of Home and Foreign firms coincide, and then at sectors in which there are cross-county differences in technology.

No Cross-Country Differences in Technology

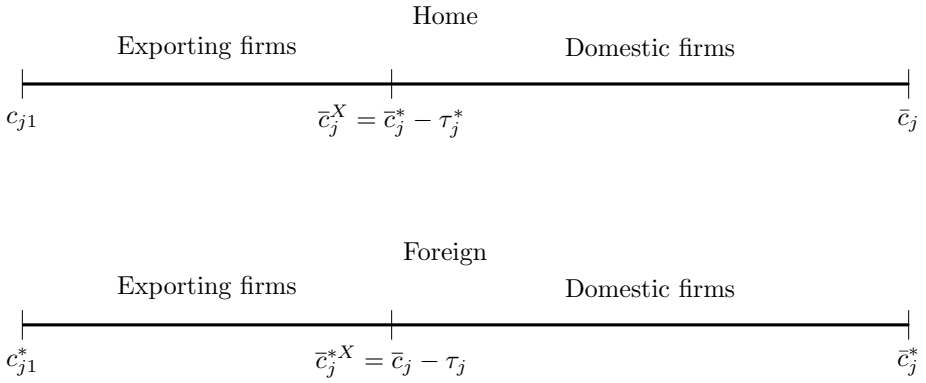
Consider a sector j with no cross-county differences in technology ($c_{j1} = c^*_{j1}$, implying $\lambda_j = 0$), so that the marginal cost distributions of Home and Foreign firms are perfectly overlapping.

The open economy equilibrium features selection into exporting by the most productive firms in each country, as in standard models of monopolistic competition with heterogeneous firms (Melitz, 2003). As shown in Figure B-3, a Home firm i will export only if it can be competitive in the Foreign market, i.e. iff $c_{ji} \leq c^X_j \equiv \bar{c}^*_j - t^*_j$. Similarly, a Foreign firm i will export iff $c^*_{ji} \leq c^{X*}_j \equiv \bar{c}_j - t_j$.

[80] From (18), we can see that when c_{j1} falls, the right-hand side of the equation must increase.

[81] The increase in productivity comes from the assumption of a constant marginal cost gap. Concerning profits, it can be shown that firm i's profits are proportional to $(N_j - i)^2$. Profits of the i^{th} firm thus increase when c_{j1} falls.

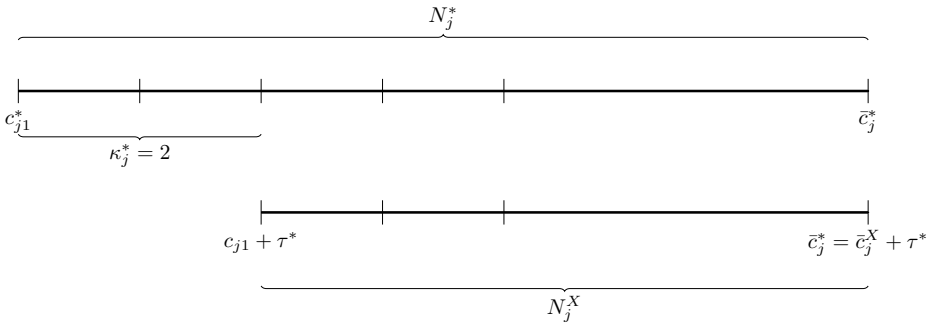
Figure B-3
Distribution of Marginal Costs of Home and Foreign Firms



To determine the equilibrium cutoffs and the profits of Home and Foreign firms, we need to keep track of their relative position in each market. We define κ_j (κ_j^*) as the "distance" between the frontier Home and Foreign firms when they operate in the Home (Foreign) markets. In the absence of technological differences between countries, this distance is only driven by tariffs, which gives a competitive edge to domestic firms relative to exporting firms.

As an example, consider Home producers of good j exporting to the Foreign country and assume that $t_j^* = 2\delta$, implying that the Home leader makes the same profits as the third most productive Foreign firm ($c_{j1} + t_j^* = c_{j3}^*$). Figure B-4 illustrates this case, i.e. when $\kappa_j^* = 2$.

Figure B-4
Competition in the Foreign Market



Notice that κ_j^* is equal to the difference between the equilibrium number of Foreign and Home firms that are active in the Foreign market, i.e. $N_j^* - N_j^X = \kappa_j^*$. Graphically, it captures the extent to which the equilibrium cost distributions of firms operating in the Foreign market (inclusive of tariffs) do not overlap. Similarly, κ_j is the difference between the equilibrium number of Home and

Foreign firms that are active in the Home market, i.e. $N_j - N_j^{*X} = \kappa_j$. In other words, κ_j and κ_j^* are sufficient statistics for the degree of import penetration in the two markets.

We can solve for the production cutoffs in the two markets. Consider first the Foreign market with an import tariff $t_j^* = \kappa_j^* \delta$. The cutoff $\bar{c}_j^*$ is determined by $\bar{c}_j^* = c_{j1}^* + N_j^* \delta$, where N_j^* is the solution to

$$\left(\frac{\alpha - c_{j1}^*}{\delta}\right) = \left(N_j^* + 2 - \kappa_j^*\right) N_j^* + \left(\frac{\kappa_j^* + 1}{2}\right) \kappa_j^*. \tag{20}$$

Likewise, in the Home market, when import tariff is $t_j = \kappa_j \delta > 0$, the cutoff $\bar{c}_j$ is determined by $\bar{c}_j = c_{j1} + N_j \delta_j$, where N_j is the solution to

$$\left(\frac{\alpha - c_{j1}}{\delta_j}\right) = \left(N_j + 2 - \kappa_j\right) N_j + \left(\frac{\kappa_j + 1}{2}\right) \kappa_j. \tag{21}$$

The profits of a Home firm i are given by

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

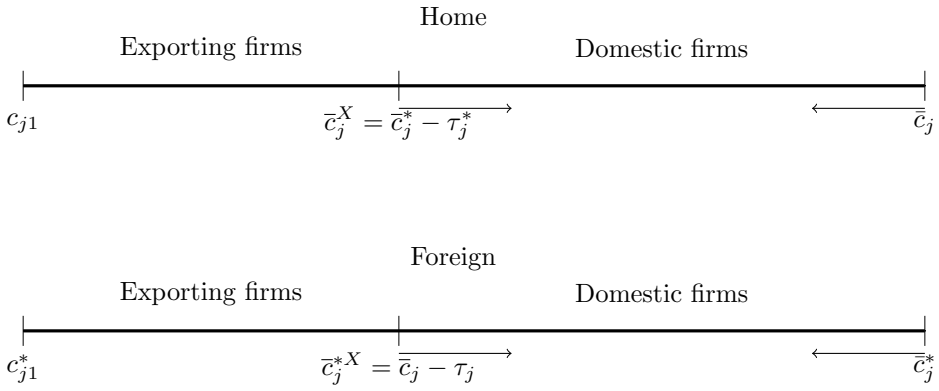
and symmetrically for a Foreign firm i,

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

The model generates intra-industry trade, as in the standard model of oligopolistic competition with homogeneous firms (Brander and Krugman, 1983). By introducing productivity differences across firms, we also generate selection into exporting, as in the standard model of monopolistic competition with heterogeneous firms (Melitz, 2003). A sufficient condition for selection into exporting is that tariffs exceed δ, i.e. $\kappa_j = \kappa_j^* \geq 1$.

The model also features aggregate productivity gains from trade liberalization. To see this, notice that (20) and (21) imply that a decrease in t_j and t_j^* leads to a decrease in the cutoffs $\bar{c}_j$ and $\bar{c^*}_j$, inducing the exit of the least productive domestic firms. By contrast, the export cutoffs $\bar{c}_j^X = \bar{c^*}_j^X$ unambiguously decrease, implying that a larger subset of domestic firms find it profitable to export. Figure B-5 illustrates the effects of a simultaneous reduction in t_j and t_j^* on domestic and export cutoffs in the two countries.

Figure B-5
Effect of a Reciprocal Tariff Liberalization on Domestic and Export Cutoffs



A reciprocal reduction in t_j and t_j^* decreases domestic profits of both exporting and non-exporting firms, but increases foreign profits of exporting firms. Thus, in the absence of technological differences across countries, non-exporting firms unambiguously lose from the entry into force of an FTA, while exporting firms may gain or lose (see discussion in Section B-1.2.3).

Cross-Country Differences in Technology

We next consider sectors in which there are cross-country differences in technology. In this case, the degree of import competition in the two markets depends not only on the level of tariffs, but also on the technological gap between the two countries.

As an example, consider a sector j in which Home has a comparative advantage ($\lambda_j > 0$), so that the most productive Home firm, with marginal cost c_{j1}, is also the global technological leader. The degree of import competition in the Foreign market is given by $\kappa_j^* = \frac{t_j^* - \lambda_j}{\delta}$.[82]

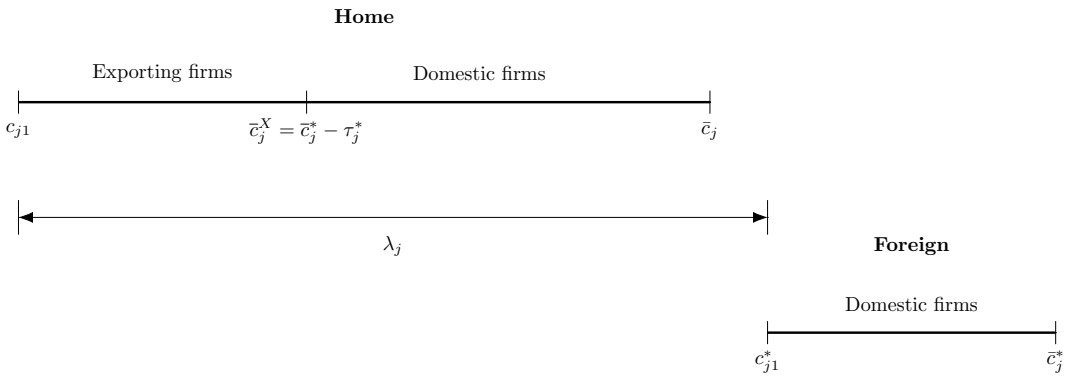
Large technological differences across countries can give rise to one-way trade. This happens if the technological gap between the two countries is large enough that the distribution of marginal costs in the closed economy do not overlap, i.e. the least productive firm in Home is more productive than the technological leader in Foreign ($\bar{c}_j < c_{j1}^*$), or equivalently

$$\lambda_j > \bar{\lambda}_j \equiv N_j \delta, \tag{22}$$

where N_j is the solution to (18). Figure B-6 illustrates the distribution of marginal costs of Home and Foreign firms when $\lambda_j > \bar{\lambda}_j$ and $\kappa_j^* > 0$.

[82] Thus the Home leader makes the same profits in the Foreign market as the $\kappa_j^* + 1$ most productive Foreign firm. For a given $t_j^* > 0$, having a cost advantage $\lambda_j > 0$ increases competition in the Foreign market. For a large enough λ_j, κ_j^* can be negative, in which case the most productive Home firm makes larger profits abroad than the most productive Foreign firm.

Figure B-6
Distribution of Marginal Costs of Home and Foreign Firms



When $\lambda_j > \bar{\lambda}_j$, Foreign firms are too unproductive to serve consumers in the Home country, even if $t_j = 0$. By contrast, Home firms export to the Foreign country if they are productive enough, i.e. iff $c_{ji} \leq c_j^X \equiv \bar{c}_j^* - t_j^*$.

In the case of one-way trade, profits of a Home firm i are given by

$$\Pi_{ji} = \frac{1}{2}(\bar{c}_j - c_{ji})^2 + \frac{1}{2}(\bar{c}_j^* - c_{ji} - t_j^*)^2 \mathbf{1}_{c_{ji}+t_j^* \leq \bar{c}_j^*}, \tag{23}$$

while Foreign firms earn

$$\Pi_{ji}^* = \frac{1}{2}(\bar{c}_j^* - c_{ji}^*)^2. \tag{24}$$

In sectors in which Home has a large technological advantage ($\lambda_j > \bar{\lambda}_j$), a reciprocal reduction in t_j and t_j^* improves Home firms' access to the foreign market, but has no impact on their domestic profits (their technological advantage is large enough to protect them from foreign competition). As discussed below, in these sectors, Home firms unambiguously gain from an FTA. By contrast, Foreign firms are forced to exit and thus unambiguously lose from the trade agreement.

B-1.2.3 Distributional Effects of the FTA

We can finally examine the effects of a proposed FTA between Home and Foreign, which leads to the elimination of tariffs in all sectors.[83]

Non-exporting Home firms always lose from the FTA:

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

[83] For simplicity, and without loss of generality, we assume that firms keep maximizing their profits independently in the two markets, even when tariffs are entirely removed ($t_j = t_j^* = 0$).

Exporting firms may gain or lose from the agreement. Their profit change is given by:

$$\begin{aligned}\Delta\Pi_{ji} &= \frac{1}{2}(\bar{c}_j - c_{ji})^2 + \frac{1}{2}(\bar{c}_j^* - c_{ji} - t_j^*)^2 \mathbf{1}_{c_{ji}+t_j^* \leq \bar{c}_j^*} \\ &\quad -\frac{1}{2}(\bar{c}_j^{FTA} - c_{ji})^2 + \frac{1}{2}(\bar{c}_j^{FTA*} - c_{ji})^2 \mathbf{1}_{c_{ji} \leq \bar{c}_j^{FTA*}},\end{aligned}$$

where $\bar{c}_j^{FTA}$ ($\bar{c}_j^{FTA*}$) identifies the least productive Home (Foreign) firms surviving in sector j after the entry into force of the trade agreement.

In sectors in which there are no technological differences between countries ($\lambda_j = \bar{\lambda}_j$), exporting firms thus benefit from the FTA only if their gains in the foreign market outweigh their losses in the domestic market. It can also be shown that the profits of exporting firms are U-shaped in the level of initial protection, with firms gaining from an FTA only if the initial tariff is lower than a threshold that increases in a firm's productivity (similarly to what shown by Brander and Krugman (1983) for the case of homogeneous oligopolists).

By contrast, in sectors in which Home has a large technological advantage ($\lambda_j > \bar{\lambda}_j$), exporting firms unambiguously gain. The biggest winners are the most productive firms in these sectors (the "global leaders"), which experience the largest increase in foreign profits following the entry into force of the FTA and do not suffer from an increase in competition in the domestic market.

It is easy to show that the maximum gains (losses) from the FTA are experienced in sectors of comparative advantage (disadvantage). To see this, consider first a sector $j \in (1, \ldots, J/2)$ in which Home has a technological advantage large enough that the FTA leads to one-way trade (from Home to Foreign) and forces Foreign firms to exit (as in Figure B-6). The maximum possible gains from the FTA are achieved by the Home leader of this sector when, before the agreement, it was facing a prohibitive foreign tariff ($t_j^* > \bar{c}_j^* - c_{j1}$). In this case, the "global leader" gains the equivalent of its autarky profits, i.e. $\Delta\Pi_{j1} = \frac{1}{2}(\bar{c}_j - c_{j1})^2 > 0$.

Consider next a sector $j' \in (J/2+1, \ldots, J)$, in which Foreign has a technological advantage large enough that the FTA leads to one-way trade (from Foreign to Home) and forces Home firms to exit (the mirror image of Figure B-6). The maximum losses are experienced by the Home leader in this sector when, before the FTA, it was completely sheltered from foreign competition ($t_{j'} > \bar{c}_{j'} - c_{j'1}^*$). In this case, the Home leader loses its autarky profits: $\Delta\Pi_{j'1} = -\frac{1}{2}(\bar{c}_{j'} - c_{j'1})^2 < 0$.

It is straightforward to show that the maximum gains from the FTA are larger (in absolute terms) than the maximum losses. In the example above, the maximum gains achieved in the comparative advantage sector j are larger than the maximum loss experienced in the comparative disadvantage sector j' ($\Delta\Pi_{j1} > \mid \Delta\Pi_{j'1} \mid$). This follows directly from the higher productivity of the "global leader" ($\bar{c}_{j1} < \bar{c}_{j'1}$).[84] Thus the biggest winners from the FTA have higher stakes in the agreement than the biggest losers.

[84] Pre-FTA profits are supermodular in productivity c and t, i.e. $\frac{d^2}{dc_{ji}dt_j^*}\Pi_{ji} = -\frac{d}{dt_j^*}(\bar{c}_j^* - t_j^*) > 0$.

B-2 Lobbying on an FTA under Monopolistic Competition

In this section, we show that the canonical model of firm heterogeneity with monopolistic competition cannot be used to rationalize our stylized facts about individual firms lobbying on the ratification of FTAs.

In our model, 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 in Melitz (2003), implies that each individual firm has no impact on the probability that the agreement enters into force. Formally, the probability of Home ratification in the presence of a continuum of firms can be written as

$$P(\mathcal{L}_P, \mathcal{L}_A, B) \equiv \frac{\mathcal{L}_P + B^+}{\mathcal{L}_P + \mathcal{L}_A + \mid B \mid}. \tag{25}$$

where

$$\mathcal{L}_P = \int_{\Omega_P} v(l_f) df.$$

In this setting, individual firms are inconsequential, since their lobbying expenditures have a negligible impact on the aggregate effort $\mathcal{L}_P$, leaving $P(\mathcal{L}_P, \mathcal{L}_A, B)$ unchanged.

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. However, this assumption would imply 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 firms do internalize their impact on market and political outcomes, then we are effectively in an oligopoly setting like the models described in Section B-1.

B-3 Microfoundations of the Contest Success Function

The probability that the FTA is ratified can be microfounded using a discrete choice model, in which firms choose between two alternatives – lobbying in favor of or against the ratification of an 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 the lobbying efforts of the two sides is captured below by ε^a and ε^p, 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 pro-FTA group Ω_P was augmented by B. By contrast, when the bias is negative, it is equivalent to increasing the contributions of the anti-FTA group Ω_P by $B^- = -B > 0$.

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

$$\mathbb{P}\left(\ln\left(\sum_{\Omega^P} v(l_i) + B^+\right) + \varepsilon^p > \ln\left(\sum_{\Omega^A} v(l_i) + B^-\right) + \varepsilon^a\right) \equiv \frac{\mathcal{L}_P + B^+}{\mathcal{L}_P + \mathcal{L}_A + \mid B \mid}.$$

B-4 Returns to Lobbying and Gains from the FTA

It can be shown that, at a given equilibrium, the returns to lobbying and the gains from the FTA are complementary, i.e. firms that would benefit more from the entry into force of the trade agreement gain more from lobbying. To see this, first note that $\Delta\Pi_f > \Delta\Pi_g$ implies higher lobbying expenditures for firm f (see Result 2). Now at a given equilibrium, consider a unilateral deviation in which firm f reduces its expenditure and sets $l_f = \hat{l}_g$. Simplifying (4), the payoff from lobbying of firm f is then

$$\mathbb{E}\left[\frac{\left(\hat{\mathcal{L}}_A + B^-\right) v(\hat{l}_g)}{\left(\hat{\mathcal{L}}_P + v(\hat{l}_g) - v(\hat{l}_f) + \hat{\mathcal{L}}_{A+} \mid B \mid\right)\left(\hat{\mathcal{L}}_P - v(\hat{l}_f) + \hat{\mathcal{L}}_{A+} \mid B \mid\right)}\right] \cdot \mathbb{E}\left[P^*(\mathbf{l}, B^*)\right] \Delta\Pi_f - \hat{l}_g.$$

This deviation would give f larger gains from lobbying than the gains for firm g before the deviation. Since in equilibrium f maximizes its payoff, it follows that its equilibrium gains from lobbying are strictly larger than g's. To conclude, comparing lobbying firms at a given equilibrium, a firm that has more to gain from the FTA has also more to gain from lobbying.

B-5 Payoff of Marginal Lobbying Firm and Number of Lobbyists

In this section, we examine how a firm's payoff from lobbying depends on the equilibrium number of organized firms. We denote by $N_L = \mid \Omega_L \mid$ the number of lobbying firms. The N_L^{th} firm is the marginal lobbying firm, i.e. the smallest organized one.

We denote by $\Delta\Pi_n$ and l_n the gains from the FTA and the lobbying expenditure of the n^{th} lobbying firm (with $n \leq N_L$). The payoff from lobbying of firm n can be written as

$$\Psi_n(N_L) = \Big(\mathbb{E}[P(\hat{\mathcal{L}}_P(N_L), B)] - \mathbb{E}[P(\hat{\mathcal{L}}_P(N_L) - v(\hat{l}_n(N_L)), B)]\Big) \cdot \mathbb{E}[P^*] \cdot \Delta\Pi_n - \hat{l}_n(N_L),$$

where $\hat{\mathcal{L}}_P(N_L) = \sum_{n \leq N_L} v(\hat{l}_n(N_L))$ is the equilibrium overall effort.

By Lemma 1, when a new firm starts lobbying, the overall lobbying effort is higher: $\hat{\mathcal{L}}_P(N_L{+}1) > \hat{\mathcal{L}}_P(N_L)$, which reduces the payoff from lobbying for all firms. Formally:

$$\Psi_n(N_L + 1) < \Psi_n(N_L), \qquad \forall\ n \leq N_L. \tag{26}$$

Given that there is perfect sorting among pro-FTA firms (Lemma 2), the new marginal lobbying firm $N_L + 1^{th}$ has a smaller gain from the FTA:

$$\Delta\Pi_{N_L+1} < \Delta\Pi_n, \qquad \forall\ n \leq N_L. \tag{27}$$

Combining (26) and (27) with Lemma 3, implies that the payoff from lobbying for the marginal firm decreases with the number of organized firms, i.e.

$$\Psi_{N_L+1}(N_L + 1) < \Psi_{N_L}(N_L).$$

B-6 Lobbying Expenditures under Coordination

In our model, we characterize the equilibrium set of concerns Ω_L of firms that select into lobbying. Result 1 states that, if condition 8 holds, $\Omega_L \subset \Omega_P$, i.e. only the largest pro-FTA firms lobby. In what follows, we examine what would be the lobbying efforts of the set of Ω_L firms in the absence of free-riding, i.e. if each firm in Ω_L no longer had the outside option of not contributing and benefiting from the lobbying efforts of others firms.[85] We fix the probability of ratification of the FTA by the Foreign country to $\mathbb{E}\left[P^*(\mathbf{l}, B^*)\right]$. Maximizing the joint expected payoff across lobbyists comes down to

$$\max_{\mathbf{l}\in\mathbb{R}^N} \mathbb{E}\left[\frac{\mathcal{L}_P + B^+}{\mathcal{L}_P + \mid B \mid}\right] \cdot \mathbb{E}\left[P^*(\mathbf{l}, B^*)\right] \left(\sum_{f\in\Omega_L} \Delta\Pi_f\right) - \sum_{f\in\Omega_L} l_f.$$

Note that by symmetry (i.e. permutation of lobbying expenditures leaves the above maximization problem unchanged), it is optimal to allocate expenditures uniformly across lobbyists, i.e. $l_f \equiv L/N_L$, where L is the overall expenditure of lobbying firms. The first-order condition is

$$\mathbb{E}\left[\frac{B^- v'(\frac{L}{N_L})}{\left(N_L v(\frac{L}{N_L}) + \mid B \mid\right)^2}\right] \cdot \mathbb{E}\left[P^*(\mathbf{l}, B^*)\right] \left(\sum_{f\in\Omega_L} \Delta\Pi_f\right) = 1.$$

To compare lobbying efforts in this scenario and in our baseline model, it is sufficient to notice that, if all lobbying firms were identical and expected the largest possible gain from the FTA, i.e. $\max \Delta\Pi_f$, their overall lobbying expenditure would still be smaller than L. Indeed, in this hypothetical scenario, the first-order condition for a single firm is given by

$$\mathbb{E}\left[\frac{B^- v'(\frac{L}{N_L})}{\left(N_L v(\frac{L}{N_L}) + \mid B \mid\right)^2}\right] \cdot \mathbb{E}\left[P^*(\mathbf{l}, B^*)\right] \left(\max \Delta\Pi_f\right) = 1.$$

It follows that free-riding reduces the effort of lobbying firms.

B-7 Shifts in the Distribution of the Political Bias

Consider a distributional shift of the political bias B that leaves unchanged the distribution of the bias when it is negative. For simplicity, it may be useful to think of right truncations at strictly positive values of the distribution of B. Specifically, if the support of B is $(\underline{b}, \overline{b})$,the new political bias is described by $\tilde{B}$ which is a truncation of B defined on $(\underline{b}, \tilde{b})$ where $\tilde{b} < \overline{b}$. 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 $\mathbb{E}_{B<0}\left[\frac{\mathcal{L}_P}{\mathcal{L}_P - B}\right] \equiv \mathbb{E}_{\tilde{B}<0}\left[\frac{\mathcal{L}_P}{\mathcal{L}_P - \tilde{B}}\right] \quad \forall \mathcal{L}_P > 0$. Consequently, only the probability that the bias is positive (or negative) impacts the expected probability of ratification for a given $\mathcal{L}_P$.

[85] In this formulation, a firm that does not lobby does not benefit from a potential FTA, i.e. its payoff is set to 0.