

LOBBYING FOR GLOBALIZATION*

Michael Blanga-Gubbay
University of Zurich

Paola Conconi
Université Libre de Bruxelles (ECARES), CEPR, CESifo, and CEP

Mathieu Parenti
Université Libre de Bruxelles (ECARES) and CEPR

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Abstract

Using detailed information from lobbying reports filed under the Lobbying Disclosure Act, we construct a unique dataset that allows us to identify which firms lobby on Free Trade Agreements (FTAs) negotiated by the United States, their position (in favor or against) and their lobbying effort on the ratification of each trade agreement. Using this dataset, we show that lobbying on FTAs is dominated by large internationalized firms, which are in favor of these agreements. On the intensive margin, we exploit exogenous variation across FTAs to show that individual firms put more effort supporting agreements that generate larger potential gains – larger improvements in their access to foreign consumers and suppliers and smaller increases in domestic competition – and that are more likely to be opposed by politicians. To rationalize these findings, we develop a new model of endogenous lobbying on trade agreements. In this model, heterogeneous firms select into trade and choose whether and how much to spend lobbying on the ratification of an FTA, and politicians may be biased in favor of or against the agreement.

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1 Introduction

Recent decades have seen a proliferation of regional trade agreements. More than 350 are currently in force, most of which take the form of free trade agreements (FTAs).¹ For example, the United States has 14 FTAs with 20 countries, including the North American Free Trade Agreement (NAFTA) and the US-Korea Free Trade Agreement (KORUS). Article XXIV of the General Agreement on Tariffs and Trade (GATT)/World Trade Organization (WTO) requires that preferential trade agreements negotiated by the United States and other developed countries must reciprocally eliminate “duties and other restrictive regulations of commerce” on “substantially all the trade” among members.²

Rodrik (2018) argues that the political economy of trade agreements is “shaped largely by rent-seeking, self-interested behavior on the export side. Rather than rein in protectionists, [FTAs] empower another set of special interests and politically well-connected firms” that gain from these agreements. In this paper, we provide empirical and theoretical support for this view. The contribution of our paper is threefold. First, exploiting detailed information from lobbying reports available under the Lobbying Disclosure Act (LDA), we construct a unique dataset that allows us to identify which firms lobby on FTAs negotiated by the United States, their position (in favor or against) and their lobbying effort (in terms of expenditure and number of reports filed) on each agreement.³ As discussed below, existing lobbying datasets (e.g. SOPR, LobbyView) do not provide information on firms’ position and lobbying effort on FTAs. Second, we use this dataset to document several novel facts. On the extensive margin, we show that lobbying on FTAs is dominated by large internationalized firms that are in favor of these agreements. On the intensive margin, we exploit exogenous variation across FTAs to show that individual firms put more effort lobbying on agreements that generate larger potential gains and are more likely to be opposed by politicians. Third, we develop a new theoretical model of endogenous lobbying on FTAs by heterogeneous firms, which provides a rationale for our empirical findings on firm-level lobbying on trade agreements.

To construct our dataset, we collect all lobbying reports related to trade agreements. Our main dataset is based on all reports filed by firms that explicitly mention the bills for the ratification of FTAs in the US Congress. This methodology allows us to focus on the final version of each trade agreement, and examine whether firms lobbied in favor of or against its entry into force.⁴ As

¹Regional trade agreements include FTAs and customs unions. As of March 2022, 354 agreements are in force according to the World Trade Organization.

²The Enabling Clause allows more flexibility in case of trade agreements negotiated by developing countries.

³We have also collected lobbying reports filed by industry associations and trade unions, but in this paper we focus on lobbying by individual firms, which are the key players when it comes to lobbying expenditures on trade agreements (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).

⁴All the trade agreements in our sample have been negotiated under Fast Track Authority. As a result, once they have been signed by the executive, they cannot be amended by US congressmen, who can only support or oppose their ratification (see Conconi *et al.*, 2012).

an alternative methodology, we use keywords rather than bill numbers to track lobbying reports related to trade agreements. This allows us to capture lobbying activities that take place during the negotiations of FTAs and also to include lobbying reports on the Trans-Pacific Partnership (TPP), which never reached the ratification stage.⁵ We matched our lobbying dataset with Compustat, to obtain additional information about lobbying firms (e.g. the sectors in which they operate, their size, whether they engage in exports and imports, their multinational status) and be able to compare them with non-lobbying firms.

A common presumption in the literature is that trade agreements can foster greater liberalization than unilateral trade policies, because they mobilize export interests 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 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. This fact holds across all FTAs that have been negotiated by the United States since the passage of the LDA in 1995. We find overwhelming support among lobbying firms for: agreements negotiated with small partners (e.g. Panama) and with larger partners (e.g. Korea); agreements that were voted in Congress, as well as agreements that did not reach the ratification stage (TPP); lobbying activities carried out after the signature of the agreement (which can only affect legislators’ ratification decisions) and before the signature (when the content of the agreement can still be modified). We also show that firms that lobby on FTAs are larger and more internationalized than non-lobbying firms, i.e. more likely to export and import and to be multinational corporations.

On the intensive margin, we examine the determinants of within-firm variation in lobbying effort across trade agreements. First, exploiting exogenous variation in pre-agreement tariffs and in the size of the FTA partners, we show that individual firms spend more supporting FTAs when they generate larger potential gains, i.e., larger improvements in their access to consumers and suppliers in foreign markets and smaller increases in domestic competition. Second, we exploit exogenous variation in Congress composition to show that individual firms spend more supporting trade agreements when legislators are less likely to vote in favor of ratification, i.e., when more legislators are members of the protectionist party and when the legislative and executive branches are not politically aligned.

Our empirical findings cannot be explained by existing models of the political economy of FTAs — in which lobbying is carried out by industry groups (Grossman and Helpman, 1995; Maggi and Ossa, 2020) or homogeneous firms (Krishna, 1998; Ornelas, 2005) — or by models of lobbying by

⁵TPP 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.

heterogeneous firms on unilateral trade policies (Bombardini, 2008). We thus develop a new model of the political economy of trade agreements, in which heterogeneous firms choose whether to pay a fixed cost to become internationalized (to export their final goods, import inputs from foreign suppliers, and establish foreign subsidiaries) and how much to spend lobbying in favor of or against the ratification of a proposed FTA. The economic structure of the model allows us to study the distributional effects of the agreement, which leads to the reciprocal elimination of tariffs across all sectors. We show that the biggest winners from the FTA have higher stakes in the agreement than the biggest losers: the maximum gains achieved by internationalized firms are larger in absolute terms than the maximum losses incurred by domestic firms.

The political structure of the model builds on the literature on contests (e.g. Tullock, 1980; Becker, 1983; Dixit, 1987; Esteban and Ray, 2001; Siegel, 2009 and 2010). Firms lobbying in favor of or against the FTA, anticipate the impact of their lobbying efforts on the probability of ratification. This probabilistic objective allows us to capture in a tractable way lobbying under trade policy uncertainty.⁶ Firms’ lobbying efforts in our model should be interpreted as reflecting the broad range of lobbying activities covered by the Lobbying Disclosure Act — “lobbying contacts and any efforts in support of such contacts, including preparation or planning activities, research, and other background work that is intended, at the time of its preparation, for use in contacts, and coordination with the lobbying activities of others.” We assume that politicians deciding on the ratification of an agreement can be biased in favor of or against it, and there is some uncertainty about their political bias.⁷ The fact that politicians may be biased against the agreement captures other possible channels — beyond lobbying expenditures — of opposition to trade agreements.⁸

Our model can explain the observed patterns on the extensive margin of firm-level lobbying on FTAs. We derive conditions guaranteeing a unique equilibrium in which only the firms with the highest stakes in the trade agreement select into lobbying. We show that, for this equilibrium to arise, it is sufficient that the marginal impact of lobbying on the probability of ratification is capped, or equivalently that firms must pay a fixed lobbying cost. The equilibrium features free riding: smaller pro-FTA firms that do not lobby benefit from the lobbying efforts of larger firms.

⁶In the absence of uncertainty, it would be hard to explain why firms may spend millions lobbying in support of agreements that do not enter into force. For example, in 2008, 34 firms filed 132 lobbying reports supporting bills H.R.5724 and S. 2830 on the ratification of the United States-Colombia Trade Promotion Agreement, which were not enacted into law. Similarly, in 2016, the year in which President Obama signed the TPP, 276 firms filed 1041 lobbying reports supporting this agreement, which did not even reach the ratification stage due to the election of President Trump.

⁷When deciding whether and how much to spend lobbying on a FTA, 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 FTAs are 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).

⁸For example, trade unions may use endorsements and mobilization of voters to influence politicians’ stance on FTAs. Blanga-Gubbay (2021) shows that lobbying against FTAs is dominated by large unions, though their lobbying expenditures are dwarfed by the amounts spent by large firms in support of these agreements (see also Figure A-3). Colantone *et al.* (2021) discuss evidence of political pressure against trade and globalization more generally.

The model is also consistent with the fact that the firms that select into lobbying on FTAs are larger and more likely to be engaged in international trade than non-lobbying firms.

On the intensive margin, the model can rationalize our empirical findings about within-firm variation in lobbying effort across trade agreements. It predicts that lobbying firms should spend more supporting FTAs that generate larger gains – i.e. larger improvements in their access to the foreign market and smaller increases in domestic competition. Firms’ lobbying expenditures should also 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 lobbying effort.

The rest of the paper is structured as follows. Section 2 discusses the related literature. In Section 3 we describe the data used in our empirical analysis. Section 4 presents our empirical findings. In Section 5, we develop a new theoretical model that can rationalize our empirical findings on the extensive and intensive margin of firm-level lobbying on FTAs. Section 6 concludes and discusses avenues of future research.

2 Related literature

Our paper contributes to the literature on the political economy of trade policy. As mentioned before, our results support Rodrik (2018)’s argument that the political economy of FTAs is dominated by large corporations that gain from these agreements. It should be stressed that our findings are not in contrast with standard view, captured by the protection for sale (PFS) model of Grossman and Helpman (1994), that trade liberalization efforts are met by staunch opposition. This view is focused on a different type of trade policy — unilateral and sector-specific tariffs — which only affects import competition, implying that trade liberalization can only hurt domestic producers. We instead focus on FTAs, which are reciprocal and cover multiple sectors, and can thus benefit large internationalized firms by improving their access to foreign consumers and suppliers.^{9,10}

Within the PFS literature, the paper that is closest to ours is by Bombardini (2008), who introduces heterogeneous firms in the model of Grossman and Helpman (1994). Our analysis differs from hers along several dimensions. From a theoretical perspective, the key difference is that we study lobbying on FTAs, while she considers lobbying on unilateral and sector-specific tariffs.

⁹Small domestic firms, on the other hand, tend to 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 markets. For example, a trade agreement like KORUS may benefit large footwear and apparel companies like Nike, but hurt smaller firms in the same sector.

¹⁰If we applied our model to lobbying on unilateral and sector-specific trade policies rather than FTAs, large firms would select into lobbying for higher tariffs, in line with the PFS literature. Moreover, our empirical results are based on lobbying expenditures, which capture two key roles played by lobbyists (Blanes i Vidal *et al.*, 201; Bertrand *et al.*, 2014): providing information to legislators to guide their decision-making process, and providing access to politicians through their connections. By contrast, the PFS literature examines “quid-pro-quo” lobbying, whereby politicians implement policies in exchange of campaign contributions.

Moreover, in her model there is no selection into trade and no distributional effects of trade policy: all firms gain from an increase in the sectoral tariff. By contrast, our model features selection into trade and distributional effects of trade policy: the entry into force of an FTA generates winners and losers. When the marginal impact of lobbying on the probability of ratification is low enough, only firms with sufficiently high stakes in the trade agreement have incentives to lobby. The asymmetry in stakes leads to selection into lobbying by the largest pro-FTA firms. In terms of data, we exploit detailed information from lobbying reports available under the LDA, which makes it possible to trace the specific policy issues targeted by lobbyists. By contrast, Bombardini (2008) uses data on campaign contributions by political action committees (PACs), which do not allow to identify the policy issues that the 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 selection into lobbying and within- and cross-firm variation in lobbying expenditures on trade agreements).

Our empirical results on the extensive margin of lobbying on trade agreements resonate with previous studies showing that large firms favor tariff reductions (e.g. Blanchard and Matschke, 2015; Ludema *et al.*, 2018).¹¹ They are also in line with several studies by political scientists, which emphasize the outsized role that large firms play in trade politics (e.g. Kim, 2017; Osgood, 2017, 2021).¹² None of these studies examines firms’ lobbying expenditures on trade agreements.

The political structure of our model is related to theoretical work by Cole *et al.* (2021), who also makes use of the tractability of the contest-success function to study lobbying on a trade agreement. They revisit the canonical rationale for trade agreements in the presence of lobbying by one pro- and one anti-agreement group in each country, which gives rise to transnational political externalities. In this setting, they show that trade agreements fail to eliminate all terms-of-trade externalities. The goal of our theoretical model is instead to explain the observed patterns on the extensive and intensive margin of firm-level lobbying on trade agreements. To this end, we study lobbying by individual firms rather than groups, allowing for free-riding across firms. We also augment the standard contest-success function framework with uncertainty about governments’ stance on FTAs. This novel feature of our model rules out trivial Nash equilibria, in which firms in both countries would choose not to lobby. Taken together, the novel elements of our model – lobbying by individual firms, free-riding, and political uncertainty — allow us to rationalize our empirical findings.

¹¹Blanchard and Matschke (2015) combine data on the activities of US foreign affiliates with detailed measures of US trade policy to study the relationship between offshoring and preferential market access. Ludema *et al.* (2018) examine lobbying by firms to influence Congressional decisions to suspend MFN tariffs on their inputs.

¹²Kim (2017) shows that more productive exporting firms are more likely to lobby to reduce tariffs, especially when their products are differentiated. He does not distinguish lobbying on FTAs from other trade policies (e.g. MFN tariffs, temporary trade barriers). Osgood (2017) documents that “America’s business community has (almost) uniformly supported trade liberalization.” His analysis is based on attitudes towards FTAs rather than on lobbying reports. Osgood (2021) studies the way firms organize collectively rather than individually.

Finally, our paper is related to the literature on firm heterogeneity in trade, which emphasizes selection effects: only the most productive firms in a sector engage in exporting (e.g. Bernard and Jensen, 1999; Melitz, 2003; Freund and Pierola, 2015), importing (e.g. Antràs *et al.*, 2017; Blaum *et al.*, 2018) and are multinational corporations (e.g. Helpman *et al.*, 2004). This literature suggests that, by eliminating all tariffs among member countries, FTAs can benefit large internationalized firms through various channels: they reduce the cost of exporting their final goods (intermediate inputs) to foreign consumers (from foreign suppliers), as well as the cost of trading with their foreign subsidiaries.¹³

3 Data

3.1 Lobbying Dataset

We construct a novel dataset on firm-level lobbying expenditures on trade agreements, using detailed information from lobbying reports available under the Lobbying Disclosure Act (LDA), which was passed in 1995. This is the first dataset that traces the payments firms make to influence the passage of trade agreements as well as their position (in favor or against the agreement).

The LDA requires individuals and organizations engaged in lobbying to register with the federal government.¹⁴ 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 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. Lobbyists must disclose all their expenditures, no matter how small.¹⁵ The legislation imposes significant

¹³As 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 regulations (e.g. rules on investment, intellectual property rights). This argument is formalized by Antràs and Staiger (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. Related work by Blanchard (2007, 2010) shows that foreign direct investment and international ownership alter optimal tariffs. Ornelas and Turner (2008, 2012) examine how bilateral bargaining among value chain partners affects optimal trade policy for final goods and inputs. Blanchard *et al.* (2021) study how global value chain linkages modify countries’ incentives to impose protection.

¹⁴There are minimum thresholds to register as a lobbyist in terms of time and income. Based on the Honest Leadership and Open Government Act of 2007 that strengthened the disclosure requirements of the 1995 Act, an individual is considered as a “lobbyist” with respect to a particular client if he or she makes more than one lobbying contact and his or her lobbying activities constitute at least 20 percent of the individual’s time in services for that client over any three-month period. In terms of income, an organization employing in-house lobbyists is exempt from registration if its total expenses for lobbying activities do not exceed \$10,000 during a quarterly period. Lobbying firms have to register if their total income for matters related to lobbying activities on behalf of a particular client exceeds \$2,500. 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.”

¹⁵When lobbying expenditures are below \$5,000 during one quarter, the lobbyist 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, a few firms report lobbying expenditures on FTAs below \$5,000.

civil and criminal penalties for violations of its requirements.

Using data on lobbying expenditures has two key advantages compared to the data on campaign contributions used in earlier empirical studies on the political economy of trade policy (e.g. Goldberg and Maggi, 1999; Gawande and Bandyopadhyay, 2000). First, and most important, data on lobbying expenditures allow researchers 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.¹⁶ Second, lobbying expenditures are the main channel of political influence, more than ten times larger than PAC contributions (see Figure A-1 in the Empirical Appendix).

To construct our dataset on firm-level lobbying on trade agreements, we use lobbying reports that are officially available from the website of the Senate’s Office Public Records (SOPR). This is the same source used to construct the LobbyView dataset by Kim (2018). 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 available in a digitalized format at the quarterly level. It is important to stress that neither SOPR nor LobbyView provide information on firms’ lobbying effort on FTAs and the direction of lobbying (in favor of/against), which is key to study the extensive and intensive margin of lobbying on trade agreements.

We examine lobbying by individual firms on trade agreements negotiated by the United States. Our main sample is based on all reports filed by firms that explicitly mention the bills for the ratification of trade agreements in the US Congress.¹⁷ This allows us to focus on the final version of an 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-3, lobbying on trade agreements is dominated by individual firms: expenditures by manufacturing firms are more than 10 times larger than those by industry groups (which mostly lobby in favor of FTAs) and more than 50 times larger than those by unions (which mostly lobby against FTAs).

Each report in our dataset provides information on the identity of the lobbying firm lobbying on a trade agreement. A firm can lobby directly (through its own lobbying department) or indirectly (through a lobbying company).¹⁸ To study the extensive margin of lobbying on FTAs, we define

¹⁶When 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).

¹⁷See 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.

¹⁸In the first case, the firm reports its name and address in Sections 1-2 of the report and the amount of the

the dummy variable $Lobbying\ on\ FTA_{f,a,t}$, which is equal to 1 if firm f 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 of or against ratification, using information from lobbying reports and official company statements.

To capture the intensive margin of lobbying on trade agreements, we construct the variable $Lobbying\ Expenditure\ on\ FTA_{f(j)a,t}$, which measures the amount (in US dollars) that firm f (operating in sector j), spends on the ratification of agreement a in year t . Lobbying reports provide information on the amount spent by each firm lobbying in a given period, but do not provide a breakdown of the expenditures by issue. To link the expenditures to a particular agreement, we follow a standard procedure in the literature (e.g. Facchini *et al.*, 2011; Ludema *et al.*, 2018), using information contained in Sections 15 and 16 of each report, in which firms have to respectively declare the general and specific issues to which their lobbying activities are related.¹⁹

We also construct an alternative measure of firms' lobbying effort on trade agreements: the variable $Number\ of\ reports\ on\ FTA_{f(j)a,t}$ is the number of lobbying reports filed by the firm in year t on agreement a . Notice that this variable does not suffer from the measurement error that arises when allocating lobbying expenditures across different policy issues.

We collapse the data at the firm-FTA-year level. Our main lobbying database contains 318 firm-FTA-year observations based on 803 reports filed by 112 firms related to the 12 FTAs ratified by the United States after the passage of the Lobbying Disclosure Act. On average, individual firms spend \$253,094 per year on the ratification of a trade agreement. The top spenders include AT&T, Daimler, Chevron, Philip Morris, JPMorgan Chase, Walt Disney, Boeing, and Pfizer. Firms usually lobby on the same agreement more than once: the average number of reports for each ratification bill is 2.53 per year.

These statistics suggest that lobbying on the ratification of trade agreements is a rare event. This result echos previous studies that examine lobbying on specific issues.²⁰ The number of lobbying

lobbying expenses in Section 1-3. In the second case, the registrant is the lobbying firm, which reports the amount received by the firm as income in Section 1-2. Direct lobbying is the prevalent mode in our data: 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.

¹⁹All the reports in our main sample mention trade (TRD) as a general issue and an FTA ratification bills as a specific issue. In most cases (91.4%), other issues are also mentioned. To define the share of expenditures associated with an FTA, we first 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 multiply this amount by the number of general issues under which the ratification of the FTA was mentioned. 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. When firms file multiple reports on the same FTA, we sum up the amounts each firm spends in a given year lobbying on a particular agreement.

²⁰For example, Kerr *et al.* (2014) find that only 327 firms lobbied on immigration policies in 1996-2008. When looking at lobbying on all policy issues, Huneus and Kim (2018) find that only 766 public firms engaged in lobbying.

firms is larger when using keywords rather than bill numbers to identify lobbying on FTAs. This is not surprising, since lobbying on ratification bills only occurs after the agreement has been signed.²¹ The limited number of reports related to trade agreements is not driven by firms not mentioning the specific issues they lobby on. This can be seen by using the LobbyView dataset by Kim (2018) and searching for all reports in which a firm lobbies on trade (i.e. mention TRD as the general issue in Section 15). In only 0.34% of the cases the firm does not mention any specific lobbying issues (i.e. leaves Section 16 empty).

To determine the position of a 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 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.*²² As explained below, 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 7-10 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 2005.²³ 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-Colombia Trade Agreement Implementation Act; To implement the United States-Colombia 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).*”²⁴ 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*

²¹For example, when looking at lobbying on the US-Korea FTA, we find 113 reports filed by 47 firms during the 2011-2012 period that mention the ratification bills for this agreement (H.R.3080 and S. 1642). When extending the analysis to all lobbying reports that mention the keywords related to the KORUS agreement, there are 588 reports filed by 90 firms during 2000-2011.

²²In 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*).

²³Notice that this is an example of an early lobbying report filed on a semi-annual basis in a non-digitalized format. As mentioned before, starting from 2008 lobbying reports are filed electronically at the quarterly level.

²⁴Most firms in our dataset lobby directly, i.e. through their in-house lobbyists: 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%).

Korea Free Trade Agreement, *entire bill*.”

As mentioned above, when the report does not 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 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.”²⁵ In all but two cases, we can code the firm’s position on the FTA, based on information from the reports or official company statements. We exclude these cases from our analysis.

Our main dataset is based on lobbying reports that 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 entry into force. 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 11 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-5 in the Empirical Appendix).

²⁵See <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.

3.2 Firm-Level Controls

We match our lobbying dataset with Compustat to obtain additional information on lobbying and non-lobbying firms. 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.²⁶ The matched dataset contains 114,412 firm-FTA-year observations, covering the 2001-2012 period.

Using information from the Fundamentals segment of Compustat, we construct measures of a firm’s size ($Employment_{f,t}$ and $Sales_{f,t}$). Combining data from different segments of Compustat and other sources, we construct dummy variables capturing a firm’s participation in international trade ($Exporter_{f,t}$, $Importer_{f,t}$, $Multinational_{f,t}$, and $Internationalized_{f,t}$). The details on the construction of these firm-level variables can be found in Section A-2.1 of the Empirical Appendix. Table A-2 provides descriptive statistics on the firms that lobby on trade agreements in the matched dataset. These tend to be large corporations: mean yearly sales and mean employment are respectively equal to 63.2 \$US billions and 159,000 employees. The overwhelming majority of firms that lobby on FTAs are also engaged in international trade: the dummy variables $Exporter_{f,t}$ and $Importer_{f,t}$ are equal to 1 for over 95% of the lobbying firms for which they can be defined; almost 85% of firms lobbying on trade agreements are multinationals and around 90% are internationalized in at least one dimension.

Compustat also contains information on a company’s main activity, based on its reported Standard Industrial Classification (SIC) code and North American Industry Classification System (NAICS) code. Figure A-2 illustrates the distribution of firms lobbying on FTAs by SIC2 sector. The top-three lobbying sectors are “Chemical & Allied Products” (SIC 28), “Industrial Machinery & Equipment” (SIC 35) and “Transportation Equipment” (SIC 37).

3.3 FTA-Level Controls

In what follows, we describe two sets of FTA-level variables, which capture exogenous variation across FTAs in their potential effects on firms’ profits and in politicians’ support for their ratification.

More details on the construction of these variables can be found in Section A-2.2 of the Empirical Appendix. All variables are constructed using data before the entry into force of the agreement. Descriptive statistics of the FTA variables are reported in Table A-3 of the Empirical Appendix.

²⁶For 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.

Expected Effects of the FTA

We construct three variables to capture exogenous variation in the potential effects of trade agreements for US firms operating in sector j . *Improved access to foreign consumers* $_{j,a}$ captures the expected gains associated with improved access to foreign consumers, due to the elimination of tariffs in sector j by in the partner(s) of agreement a . *Increased competition in the domestic market* $_{j,a}$ measures the expected losses associated with increased competition in the domestic market, due to the elimination of tariffs in sector j by the United States. *Improved access to foreign suppliers* $_{j,a}$ captures the expected gains associated with improved access to foreign consumers, due to the elimination of tariffs in sector j by in the partner(s) of agreement a .

The construction of these variables involves three steps. First, we measure the tariff reductions induced by the entry into force of agreement a . Given that US FTAs are negotiated under Article XXIV of the GATT, they must eliminate tariffs on substantially all trade among member countries. The extent of tariff reductions thus depends on the level of the MFN tariffs applied by the United States and its trading partners before the entry into force of the agreement.²⁷ As pointed out by Alfaro *et al.* (2016), MFN tariffs are the result of long rounds of multilateral trade negotiations, are very persistent, and must be applied in a non-discriminatory manner to imports from all countries, which severely limits negotiators' flexibility to respond to political pressure. Recall that all lobbying reports are filed after the passage of the Lobbying Disclosure Act in 1995. In this period, the United States and its trading partners applied MFN tariffs that were determined in the Uruguay Round of trade negotiations concluded in 1994, and can thus be taken as exogenous for firms in our lobbying dataset. Three tariff variables are relevant for firms operating in sector j : *Tariff applied by FTA partner on final good* $_{j,a}$ and *Tariff applied by US on final good* $_{j,a}$, which are respectively equal to the average MFN tariff applied on imports in sector j by the United States and the FTA partner(s) of agreement a ; and *Tariff applied by US on inputs* $_{j,a}$, the average tariff applied by the United States in industries that produce goods used as inputs by sector j , identified using the 1992 input-output tables from the US Bureau of Economic Analysis (BEA).

In a second step, we construct four measures that capture variation in the size of the partners of US FTAs. *GDP of FTA partner* $_a$ is the GDP of the partner(s) of agreement a (in millions of US dollars). *Export potential of FTA partner* $_{j,a}$ (*Competition from FTA partner* $_{j,a}$) measures US exports (imports) in industry j to (from) the partner(s) of agreement a (in millions of US dollars). *Sourcing potential of FTA partner* $_{j,a}$ measures US imports of inputs used by industry j from the partner(s) of agreement a (in millions of US dollars). To identify the relevant input industries, we again rely on input-output tables from the BEA.

In the last step, we interact the tariff variables with the variables capturing the size of the FTA partner (e.g. GDP, value of exports to the United States) to construct different versions of the

²⁷In a few cases, the United applied lower-than-MFN (GSP) rates to imports from its FTA partners. Our results are robust to dropping those cases or replacing GSP tariff rates with the corresponding MFN rates.

variables *Improved access to foreign consumers* $_{j,a}$, *Increased competition in the domestic market* $_{j,a}$, and *Improved access to foreign suppliers* $_{j,a}$.

Expected Political Support for FTAs

We construct two sets of variables capturing exogenous variation in expected political support for trade agreements from the point of view of firms lobbying on an FTA.

First, as discussed in Appendix A-2.2, US legislators' support for FTAs should 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 FTA ratification bills — and any other bills put forward by the executive. *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.

Second, we exploit variation in composition of Congress at the time of the ratification of trade agreements. Our main dataset is based lobbying reports related to trade FTA that were voted in Congress during 2001-2011 (see Figure A-1). During this period, Democrats were systematically more protectionist than Republicans (e.g. Baldwin and Magee 2000; Hiscox 2004, Conconi *et al.*, 2014; Irwin, 2017).²⁸ *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.

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 Colombia) the agreement did not reach the Congress floor due to limited political support. One may think of using variation in the *outcome* of ratification votes in Congress to proxy for politicians' support for/opposition to FTAs. However, vote outcomes reflect firms' lobbying efforts and would thus not capture exogenous variation in political support for FTAs.

4 Stylized Facts on Firm-Level Lobbying on FTAs

In this section, we document several novel facts on firm-level lobbying on trade agreements.

²⁸Based on roll-call votes on all major trade liberalization bills over the period 1973-2005, Conconi *et al.* (2014) find that membership in the Democratic party decreases the probability that congressmen support trade liberalization by more than 40 percent. Similarly, Irwin (2017) finds that Democrats were significantly less pro-trade than Republicans during the 1993-2015 period.

In Section 4.1, we focus on the extensive margin of lobbying, examining the characteristics of firms that lobby on trade agreements. The section provides empirical evidence supporting Rodrik (2018)’s claim that lobbying on FTAs is dominated by large internationalized firms that are in favor of these agreements.

In Section 4.2, we document new facts on the intensive margin of lobbying on FTAs, exploiting within-firm variation in lobbying efforts across trade agreements (in terms of expenditures and number of reports filed). We first exploit exogenous variation in pre-agreement tariffs and in the size of the FTA partners to study how firms’ lobbying effort depends on the expected gains from a trade agreement (in terms of improved access to consumers and suppliers in the foreign market) and the expected losses (due to increased competition in the domestic market). We then exploit exogenous variation in political support for FTAs, depending on whether the majority in the House and Senate is politically aligned with the President and on the party composition of Congress.

4.1 Extensive Margin

In this section, we examine which firms select into lobbying on trade agreements. We first use our lobbying dataset to study the direction of preferences, i.e. whether lobbying firms support or oppose the ratification of trade agreements. We then use the matched dataset to compare lobbying and non-lobbying firms in terms of their size and the extent to which they are internationalized.

To study the direction of preferences of firms that lobby on trade agreements, we collapse the data at the firm-FTA level.²⁹ We find that opposition to trade agreements is extremely rare: in 99.25% of the cases, firms lobbied in support of the agreement (see Figure A-4 in the Empirical Appendix).³⁰ This share is based all lobbying reports that explicitly mention the bills for the ratification of FTAs. As mentioned before, this methodology allows us to study firms’ position on the actual trade deal that, if ratified, will be implemented.

We can state the following:

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

This fact is extremely robust: it holds across all FTAs that have been negotiated by the United States since the Lobbying Disclosure Act was passed in 1995, independently on whether the agreement involved small trading partners (e.g. Panama) and larger ones (e.g. Korea). As discussed below, we find overwhelming support among lobbying firms for: 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 FTA (which can only affect legislators’ ratification decisions) and before the signature (when the content of the agreement can still be modified).

²⁹In our lobbying dataset, there are no instances in which a firm reports different positions on the same FTA.

³⁰Only two textiles firms in our dataset opposed the ratification of an FTA (with Korea). Interestingly, the same firms supported the ratification of other FTAs (with Colombia and Panama).

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.³¹

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*.³² We have obtained 588 reports filed by firms during the 2000-2011 period (see Figure A-5 in the Appendix).³³ Again, in virtually all cases (97.8%) lobbying firms supported the agreement (see Figure A-6).

One could also 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 defence 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).

Fact 1 is based on our dataset on firm-level lobbying on FTAs. We next use the matched dataset to examine the role of firm size and internationalization in explaining the extensive margin of lobbying on trade agreements. Notice that the matched dataset only includes firms that lobbied in favor of FTAs.³⁴

Looking at firms' employment and sales, we find that lobbying firms tend to be larger than non-lobbying firms. Figure 1 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.

³¹Based 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.

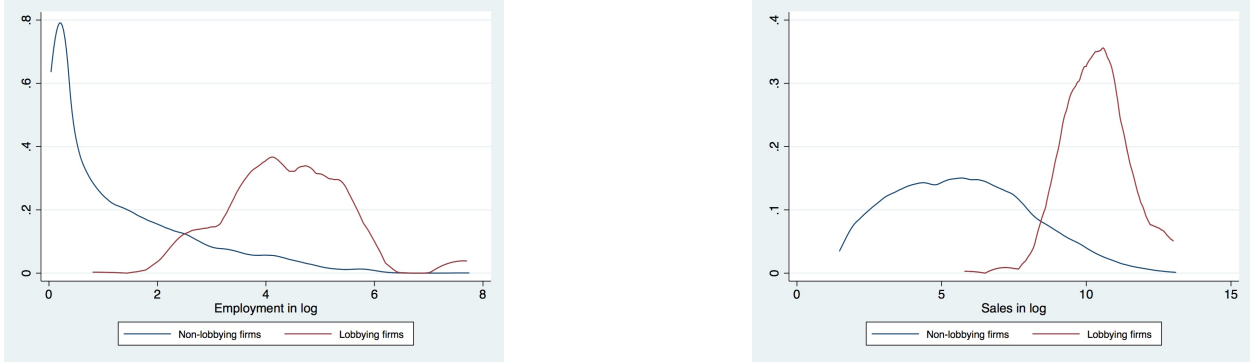
³²We can only observe lobbying expenditures on FTAs negotiated by the United States after LDA was passed in 1995. For this robustness check, we focus on KORUS, the most important of the agreements in force.

³³Notice 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.

³⁴The two textile firms mentioned in footnote 30 that lobbied against the US-Korea FTA are not in Compustat.

Figure 1

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.

This difference between lobbying and non-lobbying firms is confirmed when study the impact of firm size on the probability of lobbying on trade agreements by estimating the following linear probability model:

$$Lobbying\ on\ FTA_{f(j),a,t} = \alpha_1 Size_{f,t} + \delta_a + \delta_j + \varepsilon_{f(j),a,t}. \quad (1)$$

The dependent variable is a dummy variable equal to 1 if firm f (operating in sector j) lobbies on the ratification of agreement a in year t . 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. $Size_{f,t}$ is proxied by the log of $Employment_{f,t}$ or $Sales_{f,t}$.³⁵ We include agreement fixed effects (δ_a) and sector fixed effects (δ_j) and cluster standard errors at the agreement-sector level.³⁶

Table 1 reports the results of estimating (1). The positive and significant coefficients of the variables $Employment_{f,t}$ and $Sales_{f,t}$ indicate that larger firms are more likely to lobby on trade agreements. Table A-4 in the Empirical Appendix shows that the results continue to hold if we use a probit model to estimate the probability of lobbying on FTAs. This table also shows that lobbying on trade agreements is a rare event: the predicted probability of lobbying reported at the bottom of Table A-4 is 0.0037. The estimates in this table imply that increasing firm size by one unit leads to a 1 percent increase in the probability of lobbying.³⁷

³⁵We 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).

³⁶The effects of a trade agreement on firms' payoffs – and thus on their incentives to lobby – should be heterogeneous across FTAs and sectors, depending on pre-agreement tariffs and the size of the trading partners. For this reason, we cluster standard errors at the FTA-SIC1 level. The results of Tables 1 and 2 are robust to clustering standard errors at the sectoral (SIC1 or SIC2) level.

³⁷This result is obtained by dividing the marginal effects of the variables $Sales_{f,t}$ and $Employment_{f,t}$ in Table A-4 by the average predicted probability of lobbying reported at the bottom of the table. This finding echos results by Kim (2017), who shows that pro-trade lobbying is correlated with firm size, though his analysis is not focused on lobbying reports related to trade agreements.

Table 1
Probability of lobbying on FTAs and firm size

| | (1) | (2) |
|--|----------------------|----------------------|
| log(Employment _{<i>f,t</i>}) | 0.006*** (0.0012) | |
| log(Sales _{<i>f,t</i>}) | | 0.002*** (0.0004) |
| FTA FE | Yes | Yes |
| Sector FE | Yes | Yes |
| Observations | 87,194 | 87,194 |
| R ² | 0.102 | 0.093 |

The table reports the estimated coefficients of a linear probability model. The dependent variable, *Lobbying on FTA_{*f(j),a,t*}*, is a dummy variable equal to 1 if firm *f* (operating in sector *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*. Sector fixed effects defined at the SIC2 level. Standard errors in parenthesis clustered at the FTA-SIC1 level. Significance levels: *, 10%; **, 5%; ***, 1%.

We can thus state the following:

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

We next examine whether the probability that a firm lobbies on FTAs depends on its involvement in international trade. To this purpose, we re-estimate (1) replacing firm size with the indicator variables capturing whether a firm exports and imports, its multinational status, and its overall internationalization. The results are reported in Table 2.³⁸

Table 2
Probability of lobbying on FTAs and firm internationalization

| | (1) | (2) | (3) | (4) |
|---|----------------------|---------------------|----------------------|----------------------|
| Exporter _{<i>f,t</i>} | 0.005*** (0.0012) | | | |
| Importer _{<i>f,t</i>} | | 0.013** (0.0055) | | |
| Multinational _{<i>f,t</i>} | | | 0.006*** (0.0013) | |
| Internationalized _{<i>f,t</i>} | | | | 0.005*** (0.0011) |
| FTA FE | Yes | Yes | Yes | Yes |
| Sector FE | Yes | Yes | Yes | Yes |
| Observations | 21,779 | 8,186 | 114,412 | 114,412 |
| R ² | 0.114 | 0.142 | 0.087 | 0.086 |

The table reports the estimated coefficients of a linear probability model. The dependent variable, *Lobbying on FTA_{*f(j),a,t*}*, is a dummy variable equal to 1 if firm *f* (operating in sector *j*) lobbies on the ratification of agreement *a* in year *t*. *Exporter_{*f,t*}* (*Importer_{*f,t*}*) is a dummy variable equal to 1 if firm *f* exports (imports) in year *t*. *Multinational_{*f,t*}* is a dummy variable equal to 1 if firm *f* reports positive foreign income taxes. *Internationalized_{*f,t*}* is a dummy variable equal to 1 if firm *f* is either an exporter, or an importer, or a multinational in year *t*. Sector fixed effects defined at the SIC2 level. Standard errors in parenthesis clustered at the FTA-SIC1 level. Significance levels: *, 10%; **, 5%; ***, 1%.

³⁸We examine the role of firm size and internationalization separately in Tables 1 and 2, since there is not enough variation in *Employment_{*f,t*}* or *Sales_{*f,t*}* among internationalized firms.

The coefficients in columns 1 and 2 respectively show that firms that engage in exports and imports are more likely to lobby on trade agreements. As discussed in Section A-2.1 of the Empirical Appendix, a drawback of using these variables is that they can only be defined for a subset of firms in our matched sample. As a result, when including $Exporter_{f,t}$ ($Importer_{f,t}$) in column 1 (column 2), the number of observations is restricted to 21,779 (8,186). By contrast, the variables $Multinational_{f,t}$ and $Internationalized_{f,t}$ included in columns 3 and 4 can be defined for all the 114,412 observations in our matched sample. The coefficients of these variables show that multinational corporations and more generally internationalized firms are more likely to lobby on FTAs.³⁹

Table A-5 in the Empirical Appendix shows that the results continue to hold if we use a probit model to estimate the probability of lobbying on FTAs. The marginal effects reported in this table indicate that trade participation has a sizeable effect: being an exporter (importer) increases the probability of lobbying on FTAs by 125 (133) percent; being a multinational (internationalized) corporation increases the probability of lobbying on FTAs by 219 (250) percent.⁴⁰

The results above can be summarized as follows:

Fact 3. *Firms that lobby on FTAs are more internationalized: they are more likely to be engaged in export and import activities and to be multinational corporations.*

4.2 Intensive Margin

We next focus on the firms that lobby on FTAs and study the economic and political determinants of firms' lobbying effort on trade agreements.

We first examine how firms' lobbying effort depends on their expected gains from a trade agreement (in terms of improved access to consumers and suppliers in the foreign market) and the expected losses (due to increased competition in the domestic market). As discussed in Section 3.3, the variables $Improved\ access\ to\ foreign\ consumers_{j,a}$, $Improved\ access\ to\ foreign\ suppliers_{j,a}$, and $Increased\ competition\ in\ the\ domestic\ market_{j,a}$ are constructed by combining information on pre-agreement tariffs and the size of the FTA partner(s) and capture exogenous variation in the potential gains from a trade agreement (in terms of improved access to consumers and suppliers in the foreign market) and potential losses (due to increased competition in the domestic market).

³⁹If we reproduce Table 2 restricting the analysis to firms for which all the four indicator variables can be defined, the number of observations is reduced to 3,629 across all columns. The coefficients of all indicator variables remain positive, but only those of $Importer_{f,t}$, $Multinational_{f,t}$ and $Internationalized_{f,t}$ are significant.

⁴⁰These results are obtained by dividing the marginal effects of the trade participation variables in Table A-5 by the average predicted probability of lobbying reported at the bottom of the table.

Table 3

Lobbying expenditures on FTAs and the expected effects of the agreements

| | (1) | (2) | (3) | (4) | (5) | (6) |
|--|----------------------|-----------------------|----------------------|---------------------|----------------------|---------------------|
| log(Improved access to foreign consumers $1_{j,a}$) | 0.066** (0.0275) | 0.059** (0.0249) | 0.064** (0.0258) | | | |
| log(Improved access to foreign suppliers $1_{j,a}$) | 0.147*** (0.0519) | 0.152*** (0.0452) | 0.155** (0.0570) | | | |
| log(Increased competition in the domestic market $1_{j,a}$) | -0.081** (0.0320) | -0.098*** (0.0336) | -0.064** (0.0279) | | | |
| log(Improved access to foreign consumers $2_{j,a}$) | | | | 0.078** (0.0306) | 0.078** (0.0276) | 0.073** (0.0273) |
| log(Improved access to foreign suppliers $2_{j,a}$) | | | | 0.124** (0.0527) | 0.142** (0.0502) | 0.130** (0.0515) |
| log(Increased competition in the domestic market $2_{j,a}$) | | | | -0.093* (0.0475) | -0.120** (0.0453) | -0.081* (0.0399) |
| Firm FE | Yes | Yes | Yes | Yes | Yes | Yes |
| Year FE | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 651 | 651 | 651 | 606 | 606 | 606 |
| R ² | 0.255 | 0.256 | 0.258 | 0.264 | 0.265 | 0.266 |

The table reports the coefficients of OLS regressions. The dependent variable is $Lobbying\ expenditure\ on\ FTA_{f(j),a,t}$, the lobbying expenditure of firm f (operating in sector j) on the ratification of agreement a in year t . The explanatory variables capture exogenous variation in the potential impact of trade agreement a for US firms operating in sector j , in terms of potential gains (due to improved access to foreign consumers and suppliers) and losses (due to increased competition in the domestic market). See Section 3.3 and Appendix A-2.2 for the details on the construction of these variables. In columns 1 and 4, the variables are constructed using data on average tariffs, in columns 2 and 5 using data on average weighted tariffs, and in columns 3 and 6 using data on maximum tariffs. Standard errors in parenthesis clustered at the FTA-SIC1 level. Significance levels: *, 10%; **, 5%; ***, 1%.

To examine whether firms' lobbying expenditure on FTAs depend on the potential effects of the agreements, we estimate

$$\begin{aligned}
\log(\textit{Lobbying expenditure on FTA}_{f(j),a,t}) &= \alpha_1 \log(\textit{Improved access to foreign consumers}_{j,a}) \\
&+ \alpha_2 \log(\textit{Improved access to foreign suppliers}_{j,a}) \\
&+ \alpha_3 \log(\textit{Increased competition in the domestic market}_{j,a}). \\
&+ \delta_f + \delta_t + \varepsilon_{f(j),a,t}.
\end{aligned} \tag{2}$$

The dependent variable is the lobbying expenditure of firm f (operating in sector j) on the ratification of agreement a in year t .⁴¹ Recall that no firm in our matched dataset ever lobbies against a trade agreement. Thus *Lobbying expenditure on FTA* $_{f(j),a,t}$ captures the extent of the firm's support for the agreement. The control variables capture the potential effects of FTA a for firms operating in sector j . We always include firm fixed effects (δ_f) to control for time-invariant firm characteristics and year fixed effects (δ_t) to account for macroeconomic conditions.

The results are reported in Table 3. In columns 1 and 4, the two versions of the variables *Improved access to foreign consumers* $_{j,a}$, *Improved access to foreign suppliers* $_{j,a}$ and *Increased competition in the domestic market* $_{j,a}$ are constructed using data on average tariffs, while in columns 2-5 and 3-6 they are based on weighted average tariffs and maximum tariffs, respectively. Across all specifications, the coefficients of *Improved access to foreign consumers* $_{j,a}$ and *Improved access to foreign suppliers* $_{j,a}$ are positive and significant, indicating that firms spend more in support of FTAs that generate larger market-access gains. The coefficients of *Increased competition in the domestic market* $_{j,a}$ is instead always negative and significant, indicating that increased import competition lowers firms' support for trade agreements. In terms of magnitude, if we look for example at the coefficients in column 3 of Table 3, they 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.

One may be concerned that firm-level lobbying expenditures on trade agreements are measured with error, since lobbying reports do not provide a breakdown of the expenditures by issue. Table A-6 in the Empirical Appendix reproduces Table 3 using our alternative measure of firms' lobbying effort on trade agreements, which does not suffer from this measurement error (since it is based on the number of lobbying reports filed by a firm that mention each FTA). The results confirm that firms' lobbying effort on FTAs increase in their potential gains from the agreements.

⁴¹Firms in our dataset report positive lobbying expenditures only on some trade agreements. In these regressions, we take log of $(1 + \textit{Lobbying expenditure on FTA}_{f(j),a,t})$ to include zero expenditures on some FTAs. We obtain similar results if we use the inverse hyperbolic sine transformation of $1 + \textit{Lobbying expenditure on FTA}_{f(j),a,t}$, which unlike the log transformation is defined at zero.

We can summarize the above results as follows:

Fact 4. *Individual firms put more effort lobbying on FTAs that generate larger profit gains.*

As shown in Section 4.1, virtually all firms lobbying on FTAs support the ratification of these agreements (Fact 1). Given the lack of spending by anti-FTA firms, one may wonder why pro-FTA firms make any effort lobbying in favor. Their expenditures may be explained by the need to sway politicians who are against the ratification of trade agreements, for electoral or other motives. To verify this, we estimate

$$\log(\text{Lobbying expenditure on FTA}_{f(j),a,t}) = \alpha_1 \text{Political Support}_a + \delta_f + \delta_t + \varepsilon_{f(j),a,t}, \quad (3)$$

where $\text{Political Support}_a$ captures exogenous variation in the expected political support for the ratification of agreement a . As discussed in Section 3.3, this is captured by the different versions of the variables $\text{Divided Government}_a$ and $\text{Share of Democrats in Congress}_a$.⁴²

Table 4
Lobbying expenditures on FTAs and expected political support for the agreements

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

The table reports the coefficients of OLS regressions. The dependent variable is $\text{Lobbying expenditure}_{f(j),a,t}$, the lobbying expenditure of firm f (operating in sector j) on the ratification of agreement a in year t . $\text{Share of Democrats in Congress1}_a$ ($\text{Share of Democrats in Congress2}_a$) 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 . $\text{Divided Government1}_a$ ($\text{Divided Government2}_a$) 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%.

The results of estimating (3) are reported in Table 4. The positive and significant coefficients of the variable $\text{Divided Government}_a$ indicate that firms spend more on FTAs when Congress is

⁴²We include these variables separately, since they are highly correlated with each other. The highest correlation (0.95) is between $\text{Divided Government2}_a$ and $\text{Share of Democrats in Congress2}_a$.

not politically aligned with the executive and is thus less inclined to ratify trade agreements. The coefficients of the variable *Share of Democrats in Congress_{it}* are positive and significant, indicating that firms spend more lobbying in favor of trade agreements when the US Congress is more likely to be protectionist.

Again, we have verified that the results are robust to using the alternative measure of lobbying effort based on the number of reports, which does not suffer from the measurement error that arises when allocating lobbying expenditures across different policy issues. In line with Table 4, the results reported in Table A-7 in the Empirical Appendix confirm that individual firms put more effort (in terms of the frequency of lobbying) supporting FTAs when expected political support for the agreements is lower.

Our last empirical finding can be summarized as follows:

Fact 5. *Individual firms put more effort lobbying on FTAs when US legislators are less likely to be in favor of ratification.*

5 Model

In the previous section, we have documented novel facts about the extensive and intensive margin of firm-level lobbying on trade agreements. To rationalize these findings, in this section we develop a new model of endogenous lobbying on trade agreements by heterogeneous firms.

In Section 5.1 we describe the economic structure of the model, which allows us to study the distributional effects of trade agreements. This is characterized by two key features. First, the profits of internationalized firms are supermodular in market access and productivity. Second, the biggest winners from an FTA have higher stakes in the ratification of the agreement than the biggest losers.

In Section 5.2, 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 of or against it, and firms are uncertain about this political bias.

In Section 5.3 we show that this theoretical model can rationalize our empirical findings on the extensive and intensive margin of lobbying on trade agreements.

5.1 Economic Structure: winners and losers from an FTA

We start by discussing the effects of a proposed FTA between a Home and a Foreign country through the lens of a reduced-form model. We use a * to denote variables related to Foreign.⁴³ We

⁴³All the key results continue to hold if we consider a three-country setting, in which the trade agreement can give rise to trade diversion.

will conclude this section by reviewing a variety of possible micro-foundations.

In each country, firms differ in their profitability. We parametrize this heterogeneity by a variable $A_f \in [0, A_M]$, so that profits of a domestic firm f are given by $A_f\pi$, where π depends on (possibly endogenous) market characteristics. A_f can be a function of productivity, but may be more conveniently interpreted as a pure firm-specific demand shifter, e.g. brand or customer base. By assumption, larger firms are more profitable as soon as $\pi > 0$. To capture selection into different forms of trade participation, we assume that a firm f may become internationalized and obtain extra profits $A_f\pi_I$ upon paying a fixed cost F_I . Firm f profits are then given by

$$\Pi(A_f) = A_f\pi + \mathbf{1}_I(A_f\pi_I - F_I), \quad (4)$$

where $\mathbf{1}_I$ is an indicator variable equal to 1 for firms that are internationalized. We denote by \underline{A} the productivity of the marginal firm, which is indifferent between remaining domestic and paying the fixed cost F_I . All firms with productivity above this threshold choose to be internationalized.

The “size” of a trade agreement a is denoted by S_a and depends on the size of the trading partner and the initial (pre-agreement) tariffs applied by the two countries. The entry into force of an FTA can affect firms’ profits through various channels: all firms suffer from increased foreign competition for their final goods in the domestic market; internationalized firms enjoy market access gains associated with the reduction in the cost of exporting their final goods to the foreign market and the cost of importing inputs from independent suppliers or foreign subsidiaries in the foreign market.

We assume that internationalized firms gain from the FTA, i.e. the gains associated with improved access to the foreign consumer and input suppliers more than offset the losses due to increased competition in the domestic market and that these gains are larger the larger is the FTA:

$$\Delta\pi(S_a) + \Delta\pi_I(S_a) > 0, \quad (5)$$

with $\Delta\pi'(S_a) + \Delta\pi_I'(S_a) > 0$, where x' denotes the derivative of x .

This is for instance the case in the Melitz (2003) model where the shifter A is a power function of firm’s productivity: all continuing exporters benefit from the FTA, since the gains associated with improved access to the foreign market dominate the losses due to increased competition (see Melitz and Redding, 2014). Furthermore, these gains are also increasing with the magnitude of the market access improvement, i.e. the overall variation in trade costs. This can also be true under oligopolistic competition (see Section B-1.1 of the Theoretical Appendix for a full-fledged model of heterogeneous oligopolistic firms with endogenous entry). Furthermore, large internationalized firms can further benefit from an FTA and further expand by being able to source cheaper inputs (Antràs *et al.*, 2017; Blaum *et al.*, 2018). A further implication is that the gains from an FTA for

an internationalized firm are larger for larger firms.

The maximum losses experienced by a domestic firm are given by $\underline{A} | \Delta\pi(S_a) |$, while the maximum gains that can be reaped by internationalized firms are given by $A_M(\Delta\pi(S_a) + \Delta\pi_I(S_a))$. As soon as internationalized firms are large enough, maximum losses will be smaller in absolute terms than the maximum gains. This is for example the case in the Melitz (2003) model of trade with heterogeneous monopolistically competitive firms considered in Section B-1.1 of the Theoretical Appendix. The intuition for this result is simple: losing firms have limited stakes in trade agreements because they are much less profitable ex-ante.⁴⁴ We assume throughout the rest of this section that $A_M(\Delta\pi(S_a) + \Delta\pi_I(S_a)) > \underline{A} | \Delta\pi(S_a) |$.

5.2 Political Structure

We next describe the political structure of the model, in which firms choose whether to lobby and how much to spend in favor of or against a proposed FTA. To simplify notation, when considering lobbying on a given FTA, we omit the dependence of endogenous variables (e.g. lobbying contributions, number of lobbying firms) on the size of the FTA. We will reintroduce S_a when conducting comparative statics in Section 5.4 to explain variation in lobbying expenditures across trade agreements. The gains (or losses) from an FTA for a firm of size A_f are denoted $\Delta\Pi_f$. Ω_P is the set of Home firms that are pro agreement (i.e. for which $\Delta\Pi_f > 0$) and Ω_A is the set of Home firms that are against it (i.e. for which $\Delta\Pi_f < 0$).

Each firm decides its lobbying contribution l_f (which can be 0 if the firm chooses not to lobby) 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 $v(\cdot)$ is an increasing function.

To model lobbying expenditure in favor of and against FTAs, we follow the literature on contests (e.g. Tullock, 1980; Becker, 1983; Dixit, 1987; Esteban and Ray, 2001; Siegel, 2009; Cole *et al.*, 2021). 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. Unlike the protection for sale model of Grossman and Helpman (1994), these functions do not specify the incentives of incumbent politicians. The main advantage of following this approach is that it provides a tractable way to model lobbying efforts under uncertainty and to characterize the extensive and intensive margin of firm-level lobbying on FTAs.

We introduce two novel features in the standard Tullock contest success function, in which

⁴⁴Note that this insight would remain if we were to assume that only the largest internationalized firms gain from the FTA. In this event, the largest loser may as well be an internationalized firm: as long as the losers from an FTA are smaller than the winners, a mechanical asymmetry arises in the stakes between pro and anti-FTA firms. As shown in Section B-1.2 of the Theoretical Appendix, the key insights of the Melitz (2003) model concerning the distributional effects of an FTA can continue to hold in a setting with heterogeneous oligopolistic firms.

the probability that one of the parties wins depends on the ratio of efforts of the parties in the conflict.⁴⁵ 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 ($B < 0$).⁴⁶ Politicians may have a positive bias if they believe that trade agreements are efficiency-enhancing. A negative bias could arise due to distributional concerns: politicians who are averse to inequality may worry that the entry into force of the FTA would hurt small firms in their constituency. Party affiliation or re-election motives can also lead to a protectionist bias, as shown by Conconi *et al.* (2014). We model B as a random variable, reflecting uncertainty about the direction of the political bias.⁴⁷

The second novel feature is that the number and identity of lobbying firms is endogenous. Firms weigh the effect on the probability of ratification due to their own participation against their lobbying costs. Crucially, the outside option (not lobbying) is also endogenous, since 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. $\mathbb{E}[P(\mathcal{L}_P, \mathcal{L}_A, B)] \cdot \mathbb{E}[P^*(\mathcal{L}_P^*, \mathcal{L}_A^*, B^*)]$.⁴⁸

The payoff from lobbying of firm f is

$$\underbrace{\underbrace{(\mathbb{E}[P(\mathcal{L}_P, \mathcal{L}_A, B)] - \mathbb{E}[P(\mathcal{L}_P - v(l_f), \mathcal{L}_A, B)])}_{\text{impact of lobbying on exp. prob. of ratification in Home}} \cdot \underbrace{\mathbb{E}[P^*(\mathcal{L}_P^*, \mathcal{L}_A^*, B^*)]}_{\text{exp. prob. of ratification in Foreign}} \cdot \Delta\Pi_f - \underbrace{l_f}_{\text{cost of lobbying}}}_{\text{benefit from lobbying}} \quad (6)$$

where $\Delta\Pi_f > 0 \forall f \in \Omega_P$ and $\Delta\Pi_f \leq 0 \forall f \in \Omega_A$. We assume that $v(\cdot)$ is a concave and twice differentiable function with $v(0) = 0$, implying decreasing returns to lobbying. The concavity of $v(\cdot)$ also implies that, within a group, lobbying expenditures are (imperfect) substitutes and guarantees an interior solution to each lobbying firm's problem.⁴⁹ We also require that the marginal lobbying effort features a finite upper bound, i.e. $\kappa \equiv v'(0) < +\infty$. In the presence of uncertainty in the direction of the political bias, this assumption implies a finite expected return to lobbying on the

⁴⁵This 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.

⁴⁶Introducing 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).

⁴⁷From the perspective of the firms in our data, this assumption implies that, at the time of their lobbying, they are still uncertain about whether there is a majority of legislators in favor of FTA ratification.

⁴⁸In 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.

⁴⁹For any overall lobbying expenditure L , $v(\cdot)$ is concave if and only if $N_L v(L/N_L)$ increases with the number of lobbying firms N_L , for any $N_L > 0$.

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.⁵⁰ Broadly speaking, κ governs the toughness of lobbying: a lower κ decreases the return to lobbying for all firms.

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

$$P(\mathcal{L}_P, \mathcal{L}_A, B) \equiv \frac{\mathcal{L}_P + B^+}{\mathcal{L}_P + \mathcal{L}_A + |B|}. \quad (7)$$

where $B^+ = \max\{B, 0\}$. A couple of remarks are in order. First, the fact that the policy outcome is probabilistic reflects 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). 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 $B^- = -B > 0$. Thus introducing a political bias unambiguously raises (lowers) the probability that an FTA is ratified in the absence of pro-FTA (anti-FTA) contributions.

Second, the entry into force of the agreement requires ratification by both countries, implying strategic interdependencies between them (Cole *et al.*, 2021). As a result, if pro-FTA (resp. anti-FTA) firms in the Home country conjectured an equilibrium probability of ratification equal to zero (resp. one) by the Foreign country, their best response would be not to lobby in favor (resp. against) the ratification. Due to political uncertainty, however, a firm in the Home country, will always conjecture the equilibrium probability of the Foreign country ratifying the agreement $\mathbb{E}[P^*(\mathcal{L}_P^*, \mathcal{L}_A^*, B^*)]$ to be strictly bounded between 0 and 1. Uncertainty in the direction of the political bias thus rules out trivial Nash equilibria where firms in both countries would choose not to lobby. For simplicity, we assume that the political bias follows a Bernoulli distribution and denote with p the probability that the bias is positive and normalize its value to 1.

In what follows, we focus on one side of the contest, namely the lobbying game among firms in the Home country, taking as given the expected probability that the partner country ratifies the agreement, which we denote as $\mathbb{E}[P^*]$. As shown below, this implies that although $\mathbb{E}[P^*]$ is endogenous, the theoretical results on the extensive and intensive margin of firm-level lobbying on FTAs can be derived without explicitly solving for it.

⁵⁰The 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.

5.3 Firm Lobbying on FTAs: Extensive Margin

In this section, we characterize the Nash equilibrium in which a subset of lobbying firms at Home select into lobbying, i.e. choose a positive lobbying expenditure \hat{l}_f .

In Section B-2 of the Theoretical Appendix, we show that lobbying expenditures within a group are strategic substitutes: the participation of a new pro-FTA firm increases $\hat{\mathcal{L}}_P$, decreasing individual lobbying efforts. A similar reasoning applies to anti-FTA firms (see Lemma 1).

We also characterize the endogenous set of lobbying firms, showing that any equilibrium must feature perfect sorting (see Lemma 2): 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.

Moreover, it can be shown that firms experiencing larger gains (or losses in absolute value) from the FTA gain more from lobbying (see Lemma 3).

In what follows, we show that our model can rationalize the key findings on the extensive margin of firm-level lobbying on trade agreements documented in Section 4.1: lobbying on FTAs is dominated by large and internationalized firms, which support the ratification of these agreements.

From Lemma 2, it is sufficient to require that the firm that would experience the largest loss from the FTA ($\min \Delta \Pi_f < 0$) would never find it profitable to lobby against it. As shown below, a sufficient condition for no lobbying by anti-FTA firms is

$$\underline{A} \mid \Delta \pi \mid < 1/\kappa. \quad (8)$$

This condition guarantees that the marginal return to lobbying is too low for the biggest loser from the agreement, implying that no anti-FTA firm will find it profitable to lobby.

An alternative way to rationalize the lack of lobbying by anti-FTA firms is to assume that firms must pay a fixed cost F_L to be politically organized. In this setting, the sufficient condition for no anti-FTA lobby can simply be written as

$$\underline{A} \mid \Delta \pi \mid < F_L. \quad (9)$$

Notice that introducing a fixed cost would result in multiple equilibria (as in Bombardini, 2008), which need not feature perfect sorting.⁵¹ Uniqueness and perfect sorting can be restored if we assume that the firms that experience the largest gains from lobbying move first, as in the oligopolistic Bertrand game considered by Gaubert and Itskhoki (2021). In our baseline model, κ plays a similar role to an FTA-specific fixed lobbying cost F , as it requires that the stakes from the FTA are high enough for lobbying to be profitable. Like higher fixed costs, a low κ reduces the expected gains

⁵¹This is a general feature of models of asymmetric oligopoly with endogenous entry. 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.

from lobbying: by decreasing the marginal impact of lobbying on the ratification of the agreement, a low κ implies that only the firms with the highest stakes in the FTA select into lobbying.

We can characterize the equilibrium set of lobbying firms, $\Omega_L = \{f \in \Omega_P \text{ s.t. } A_f \geq \bar{A}\}$. If condition 8 (or equivalently condition (9)) holds, anti-FTA firms do not lobby.

We now state our first theoretical result, which provides a rationale for the empirical findings on the extensive margin of firm-level lobbying on trade agreements:

Result 1. *Under condition 8 (or equivalently condition (9)), there is a unique equilibrium in which only the largest internationalized pro-FTA firms select into lobbying ($\Omega_L \subset \Omega_P$).*

Proof of Result 1

We have already established that if (8) (or alternatively (9)) holds, the equilibrium set of lobbying firms does not include anti-FTA firms ($\Omega_A \cap \Omega_L = \emptyset$). By contrast, the presence of large internationalized firms guarantees that at least some firms make large enough gains from the FTA to find it profitable to lobby in favor of the agreement. We now show that Ω_L , the equilibrium set of lobbying firms, includes only the largest firms in the economy, which gain the most from the FTA. To prove this result, we examine how a firm's payoff from lobbying depends on the equilibrium number of lobbying firms. We denote by $N_L = |\Omega_L|$ the number of lobbying firms. The N_L^{th} firm is the marginal lobbying firm, i.e. the smallest firm that chooses $l_f > 0$.

Let us 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

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

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:

$$\Psi_n(N_L+1) < \Psi_n(N_L), \quad \forall n \leq N_L. \quad (10)$$

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:

$$\Delta\Pi_{N_L+1} < \Delta\Pi_n, \quad \forall n \leq N_L. \quad (11)$$

Combining (10) and (11) with Lemma 3, implies that the payoff from lobbying for the marginal firm decreases with the number of lobbying firms, i.e. $\Psi_{N_L+1}(N_L+1) < \Psi_{N_L}(N_L)$. Thus 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 partition of pro-FTA firms into lobbying. ■

Note that the equilibrium described by Result 1 features free riding: some of the 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-4 in the Theoretical Appendix). Notice also that, given the economy-wide nature of the FTA, free riding occurs not only within but also across industries (i.e. small non-lobbying pro-FTA firms in an industry can benefit from the lobbying efforts of larger lobbying firms operating another industry).

Summing up, our theoretical model provides a rationale for the empirical findings documented in Section 4.1 on the extensive margin of firm-level lobbying on trade agreements. It explains why lobbying firms always support FTAs (Fact 1): only those firms that gain the most from the entry into force of these agreements have an incentive to lobby. It also consistent with the fact that firms lobbying on trade agreements are larger and more likely to be internationalized (Facts 2 and 3).

5.4 Firm Lobbying on FTAs: Intensive Margin

We conduct two comparative statics exercises to show that our model can explain the empirical findings documented in Section 4.2 on the intensive margin of firm-level lobbying on trade agreements.

It should be stressed that, to compare lobbying expenditures in different equilibria, we do not need to track the change in the foreign probability of ratification $\mathbb{E}[P^*]$ so we will treat it parametrically. This is because a country's probability of ratification is strictly increasing in the other country's. Consequently, starting from a stable equilibrium, any shift upwards in $\mathbb{E}[P]$ as a function of the other country's probability of ratification will result in a higher equilibrium foreign probability of ratification $\mathbb{E}[P^*]$, further increasing $\mathbb{E}[P]$. The *direction* of the comparative statics can thus be derived discarding the change in $\mathbb{E}[P^*]$ (see Vivès (2005) for a general discussion of comparative statics in games featuring complementarities).⁵²

In order to conduct these comparative statics, we start by expressing the equilibrium cutoff $\bar{A}(S_a)$. When only pro-FTA firms lobby, the first-order condition for each lobbying firm f can be written as

$$v'(\hat{l}_f) \left(\frac{1-p}{(\hat{\mathcal{L}}_P + 1)^2} \right) \mathbb{E}[P^*] \Delta \Pi_f = 1. \quad (12)$$

Denoting by \bar{A} the size of the marginal lobbying firm, the optimal lobbying expenditures of firm f are given by:

$$v'(\hat{l}_f) = \kappa \frac{\bar{A}}{A_f}. \quad (13)$$

⁵²While the parallel nature of the contest does not matter for our results, a transnational political externality may have important implications for the design of trade agreements, as shown by Cole *et al.* (2021).

Using (12) and (13), $\bar{A}(S_a)$ solves the following equation:

$$\frac{(1-p)\kappa}{\left(\hat{\mathcal{L}}(\bar{A})+1\right)^2}\mathbb{E}[P^*]\bar{A}(\Delta\pi(S_a)+\Delta\pi_I(S_a))=1, \quad (14)$$

where the equilibrium overall equilibrium lobbying effort is given by

$$\hat{\mathcal{L}}(\bar{A})=\sum_{N_f=1}^{N_L(\bar{A})}v\left(v^{f-1}\left(\kappa\frac{\bar{A}}{A_f}\right)\right). \quad (15)$$

The following result provides a theoretical rationale for Fact 4 in our empirical analysis:

Result 2. *Firms spend more supporting FTAs that generate larger gains.*

Proof of Result 2

Let us consider an increase in the size of a FTA from S_a to $S_{a'}$ and proceed by contradiction. If the set of lobbying firms (weakly) decreased then the overall lobbying effort would necessarily (weakly) decrease by equation (15). This, in turn, would imply that (14) can no longer hold, since the marginal firm would be (weakly) larger, thus making strictly larger gains with $S_{a'}$, i.e. $\bar{A}(S_{a'})\left(\Delta\pi(S_{a'})+\Delta\pi_I(S_{a'})\right) > \bar{A}(S_a)\left(\Delta\pi(S_a)+\Delta\pi_I(S_a)\right)$. In conclusion, more firms lobby on the larger agreement a' , meaning that additional and smaller firms lobby compared to agreement a . By equation (13), this implies that all firms lobby more on a' . ■

We next consider the role of political bias. It is straightforward to verify that, if pro-FTA firms knew with certainty that the government is biased in favor of the FTA ($p=1$), they would never find it profitable to lobby in favor. 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 ($p=0$). 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 $\mathbb{E}[B] > 0$. The following result provides a theoretical rationale for Fact 5 in our empirical analysis:

Result 3. *Pro-FTA firms spend more lobbying on FTAs when politicians are more likely to be biased against the agreement.*

Proof of Result 3

Through (14), a decrease in p decreases \bar{A} : more firms will lobby when the probability that politicians are in favor of ratifying the trade agreement is lower. Indeed, inspecting equation (15), notice that lobbying efforts on a given FTA are lower when fewer firms lobby or, equivalently, when the

marginal firm’s gain from that FTA is higher. This implies that $\frac{\bar{A}\Delta\Pi}{(\hat{\mathcal{L}}(\bar{A})+1)^2}$ is a strictly increasing in \bar{A} . By equation (13), the marginal firm being smaller implies that all firms lobby more on the larger FTA. ■

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.

6 Conclusion

Recent decades have seen a surge in the number of regional trade agreements. In this paper, we construct a unique dataset allowing us to trace all lobbying expenditures related to FTAs negotiated by the United States since the passage of the Lobbying Disclosure Act. Using this dataset, we show that large pro-FTA firms dominate lobbying expenditures on these agreements. In virtually all 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 — and for lobbying reports filed before the ratification phase. Relative to non-lobbying firms, firms that lobby on trade agreements are larger and more internationalized (i.e. they are more likely to be engaged in exports and imports and to be multinationals). On the intensive margin, we find that individual firms spend more lobbying on a trade agreement 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.

Existing models of the political economy of trade agreements do not feature heterogeneous firms and thus cannot explain our empirical findings. We thus develop a new theoretical model, in which heterogeneous firms choose whether to lobby and how much to spend in favor of or against the ratification of a proposed FTA. The political structure of the model builds on the literature on lobbying/rent-seeking in contests and allows us to model in a tractable way lobbying efforts under uncertainty. We show that the biggest winners from the FTA have higher stakes in the agreement than the biggest losers. The model can provide a theoretical rationale for our empirical findings on the extensive and intensive margin of firm-level lobbying on trade agreements.

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. It is important to stress that, if firms had nothing to gain from trade agreements in terms of improved access to foreign markets, they would not lobby in support of their ratification. Still, it would be interesting to study lobbying during the negotiations of FTAs, during which firms can try to include provisions that can at least partially shelter them from increased import competition (e.g. long phase-out periods).⁵³ In a complementary paper (Blanga-Gubbay *et al.*, 2021), we examine lobbying by firms on the *content* of trade agreements. We show that large firms lobby to include in trade agreements other favorable provisions, e.g. rules on intellectual property rights and investment that can help to protect their tangible and intangible assets in foreign markets.⁵⁴

Our analysis has implications for the debate on the causes and consequences of rising market concentration (e.g. Gutiérrez and Philippon, 2018; Autor *et al.*, 2020; De Loecker *et al.* 2020). Our empirical and theoretical results show that large corporations dominate lobbying on FTAs, spending millions on the ratification of these agreements. These findings suggest that, by lobbying to implement favorable legislation, “superstar” firms can further increase their market power. On the other hand, there are channels through which this lobbying could be beneficial: in standard models of monopolistic competition with heterogeneous firms and variable mark-ups, the largest firms set higher mark-ups, which typically lead them to under-produce; market expansion through trade can then reduce these distortions (Dhingra and Morrow, 2019). An important avenue for future research is to study the welfare effects of firm-level lobbying on trade agreement and other policies.

⁵³This type of lobbying could help to explain the variation in the rules of origin (RoO) contained in trade agreements. For example, NAFTA features extensive product-level variation in RoO sourcing restrictions (see Conconi *et al.*, 2018). See Dhingra *et al.* (2021) for an analysis of the effects of deep trade agreements on trade and welfare.

⁵⁴For 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 signed by President Obama 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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A. Empirical Appendix

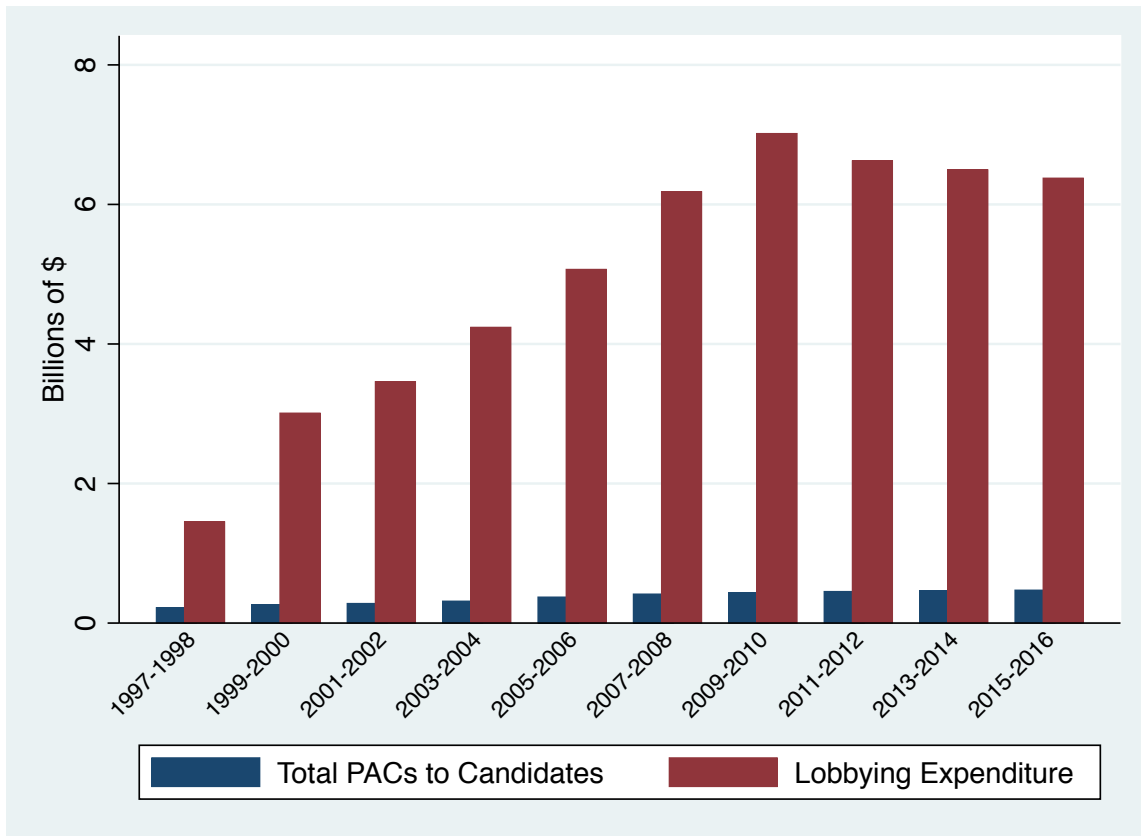
A-1 Tables and Figures

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 |

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



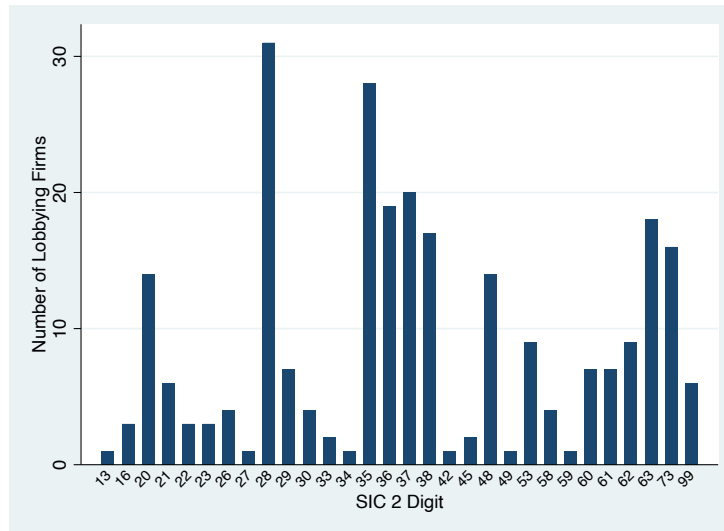
The figure reports the total amounts of lobbying expenditures and campaign contributions on all policy issues, between the 105th Congress (1997-1998) and the 114th Congress (2015-2016). The data come from the Center for Responsive Politics (see <http://www.OpenSecrets.org>).

Table A-2
Descriptive statistics on firms lobbying on FTAs

| | Observations | Mean | Std. Dev. | Min | Max |
|---|--------------|-----------|-----------|---------|-----------|
| Lobbying expenditure on FTA $_{f(j),a,t}$ | 259 | 283,207.5 | 397,399.8 | 3,333.3 | 2,770,000 |
| Lobbying reports on FTA $_{f(j),a,t}$ | 259 | 2.44 | 1.548 | 1 | 8 |
| 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 |
| Exporter $_{f,t}$ | 140 | 0.95 | 0.219 | 0 | 1 |
| Importer $_{f,t}$ | 113 | 0.973 | 0.161 | 0 | 1 |
| Multinational $_{f,t}$ | 259 | 0.842 | 0.366 | 0 | 1 |
| Internationalized $_{f,t}$ | 259 | 0.919 | 0.273 | 0 | 1 |

Lobbying expenditure on FTA $_{f,a,t}$ is the lobbying expenditure of firm f (operating in sector j) in year t on the ratification of agreement a . *Lobbying reports on FTA $_{f,a,t}$* is the number of reports filed by firm f (operating in sector j) in year t on the ratification of agreement a . *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 $_{f,t}$* (*Importer $_{f,t}$*) is a dummy variable equal to 1 if firm f exports (imports) in year t . *Multinational $_{f,t}$* is a dummy variable equal to 1 if firm f reports positive foreign income taxes. *Internationalized $_{f,t}$* is a dummy variable equal to 1 if firm f is an exporter, and importer, or a multinational in year t .

Figure A-2
Firms lobbying on FTAs, by sector



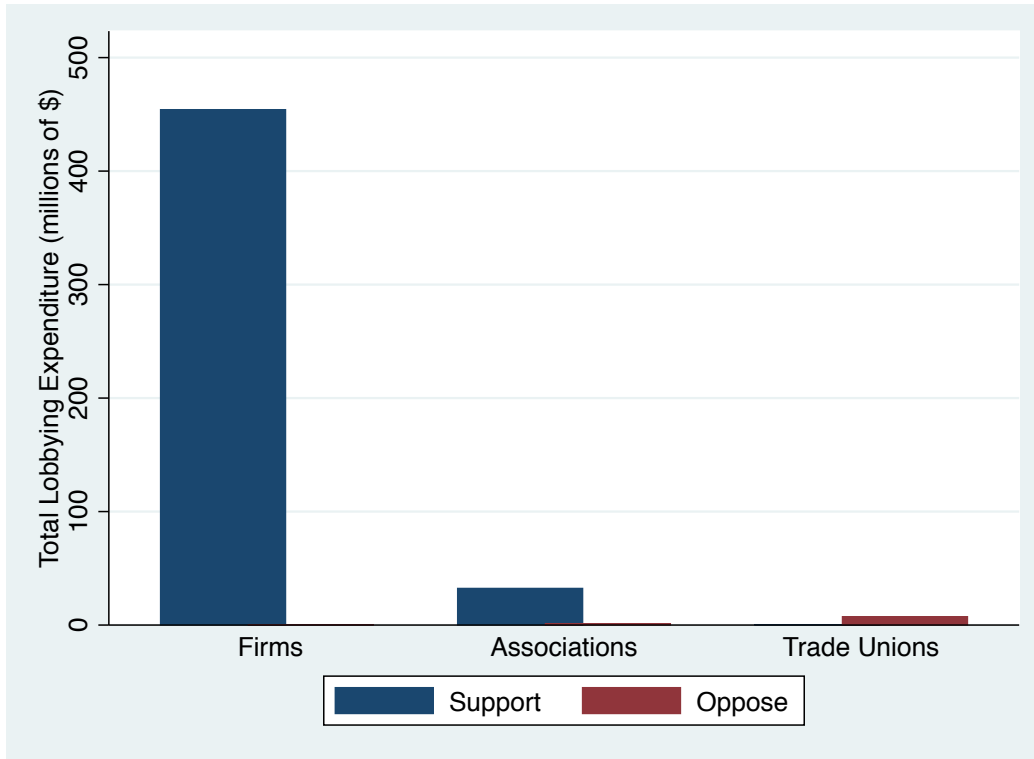
The figure reports the number of firms lobbying on FTAs by SIC2 sector.

Table A-3
Descriptive statistics, FTA variables

| | Observations | Mean | Std. Dev. | Min | Max |
|--|--------------|------------|-------------|-----------|-------------|
| Improved access to foreign consumers $1_{j,a}$ | 163 | 25,479,120 | 140,492,200 | 0 | 908,176,800 |
| Improved access to foreign suppliers $1_{j,a}$ | 155 | 56,053.73 | 140,767.80 | 0 | 988,472.80 |
| Increased competition in the domestic market $1_{j,a}$ | 145 | 1,510,635 | 5,653,029 | 0 | 54,470,180 |
| Improved access to foreign consumers $2_{j,a}$ | 162 | 225,730.4 | 1,119,313 | 0 | 7,229,894 |
| Improved access to foreign suppliers $2_{j,a}$ | 155 | 13.61152 | 70.36 | 0 | 743.73 |
| Increased competition in the domestic market $2_{j,a}$ | 141 | 2,221.76 | 18,584.12 | 0 | 218,166.60 |
| Divided Government 1_a | 256 | 0.699 | 0.460 | 0 | 1 |
| Divided Government 2_a | 256 | 0.270 | 0.445 | 0 | 1 |
| Share of Democrats in Congress 1_a | 256 | 0.479 | 0.033 | 0.456 | 0.533 |
| Share of Democrats in Congress 2_a | 256 | 0.482 | 0.033 | 0.460 | 0.537 |
| Tariff applied by FTA partner on 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 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 |
| Export potential of FTA partner $_{j,a}$ | 192 | 4,510.58 | 5,834.76 | 0.022 | 21,719.35 |
| Sourcing potential of FTA partner $_{j,a}$ | 155 | 39.85 | 129.66 | 0.000 | 1,403.77 |
| Competition from FTA partner $_{j,a}$ | 141 | 268.88 | 1,618.80 | 0.001 | 17,453.33 |

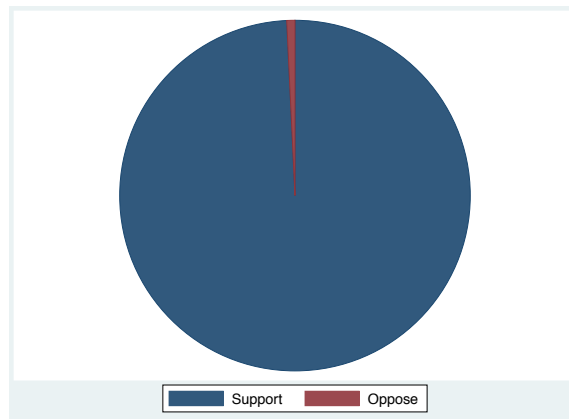
The table reports descriptive statistics of the FTA variables used in our empirical analysis (top panel) and of the variables used to construct them (bottom panel). All variables are constructed using pre-agreement data, for the year of the ratification of agreement a . *Improved access to foreign consumers $1_{j,a}$* is the multiplication between *Tariff applied by FTA partner on final good $_{j,a}$* and *GDP of FTA partner $_a$* . *Improved access to foreign suppliers $1_{j,a}$* is the multiplication between *Tariff applied by US on inputs $_{j,a}$* and *GDP of FTA partner $_a$* . *Increased competition in the domestic market $1_{j,a}$* is the multiplication between *Tariff applied by US on final good $_{j,a}$* and *GDP of FTA partner $_a$* . *Improved access to foreign consumers $2_{j,a}$* is the multiplication between *Tariff applied by FTA partner on final good $_{j,a}$* and *Export potential of FTA partner $_{j,a}$* . *Improved access to foreign suppliers $2_{j,a}$* is the multiplication between *Tariff applied by US on inputs $_{j,a}$* and *Sourcing potential of FTA partner $_{j,a}$* . *Increased competition in the domestic market $2_{j,a}$* is the multiplication between *Tariff applied by US on final good $_{j,a}$* and *Competition from FTA partner $_{j,a}$* . *Share of Democrats in Congress 1_a* (*Share of Democrats in Congress 2_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 Government 1_a* (*Divided Government 2_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. *Tariff applied by FTA partner on final good $_{j,a}$* is the maximum SIC4 tariff applied by the partner(s) 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 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). *Export potential of FTA partner $_{j,a}$* is total US exports (in millions of US dollars) of good j to the partner(s) of agreement a . *Sourcing potential of FTA partner $_{j,a}$* is US imports (in millions of US dollars) of the top 100 inputs needed to make of good j from the partner(s) of agreement a . *Competition from FTA partner $_{j,a}$* is US imports (in millions of US dollars) of good j from the partner(s) of agreement a .

Figure A-3
Lobbying expenditures on FTA ratification bills



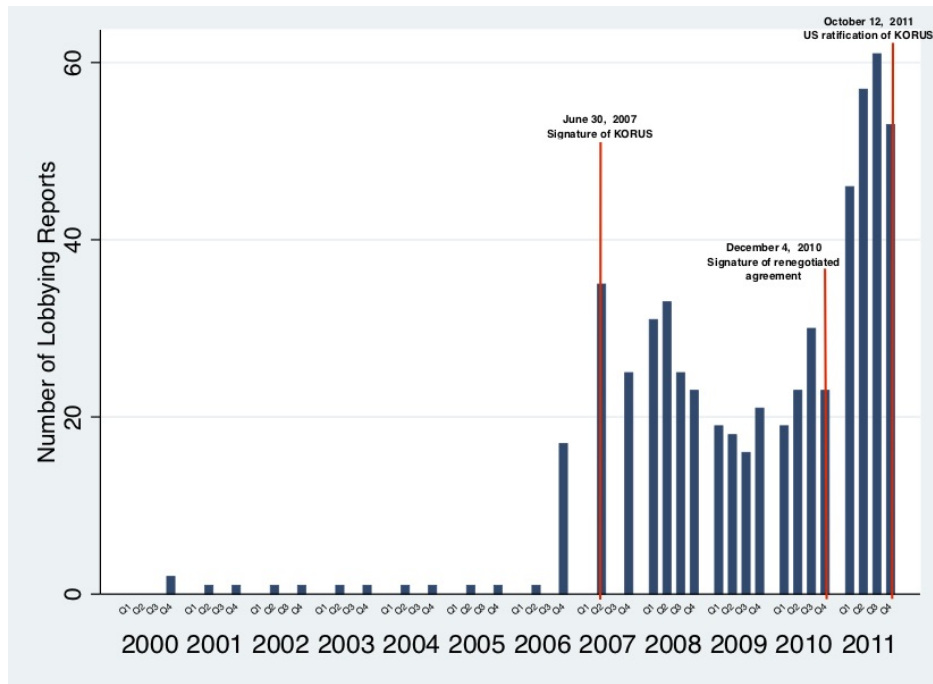
The figure reports total lobbying expenditures in favor and against FTAs by manufacturing firms and firm associations, as well as trade unions, based on all lobbying reports that mention the FTA ratification bills.

Figure A-4
Firms' position on FTAs



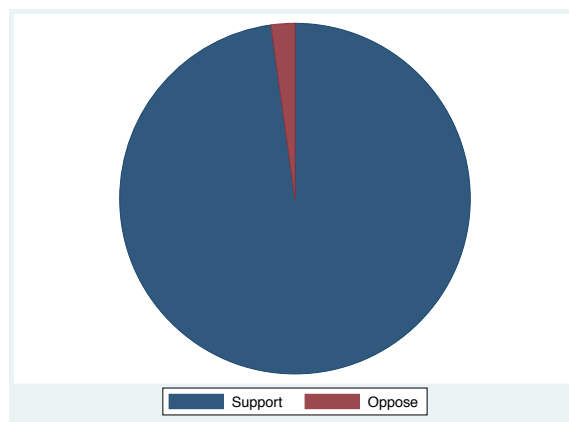
The figure reports the share of observations in which firms lobbied in favor of or against FTAs, based on all lobbying reports that mention the ratification bills of FTAs.

Figure A-5
Lobbying reports on US-Korea FTA



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

Figure A-6
Firms' position on the US-Korea FTA



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

Figure 7
Lobbying Report (Example 1)

| | |
|---|--|
| Clerk of the House of Representatives Legislative Resource Center B-106 Cannon Building Washington, DC 20515 | Secretary of the Senate Office of Public Records 232 Hart Building 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 8
Lobbying Report (Example 2)

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

LOBBYING REPORT

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

| | |
|---|---|
| 1. Registrant Name <input checked="" type="checkbox"/> Organization/Lobbying Firm <input type="checkbox"/> Self Employed Individual PMI Global Services Inc. | |
| 2. Address Address1 <u>700 13th Street, NW</u> Address2 <u>Suite 325</u> City <u>Washington</u> State <u>DC</u> Zip Code <u>20005</u> Country <u>USA</u> | |
| 3. Principal place of business (if different than line 2) City <u>New York</u> State <u>NY</u> Zip Code <u>10017</u> Country <u>USA</u> | |
| 4a. Contact Name Ms. <u>Beverly McKittrick</u> | b. Telephone Number <u>2024952661</u> |
| c. E-mail <u>beverly.mckittrick@pminl.com</u> | 5. Senate ID# <u>400265213-12</u> |
| 7. Client Name <input checked="" type="checkbox"/> Self <input type="checkbox"/> Check if client is a state or local government or instrumentality PMI Global Services Inc. | 6. House ID# <u>401470000</u> |

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 | |
|---|--|
| <p>12. Lobbying</p> <p>INCOME relating to lobbying activities for this reporting period was:</p> <p>Less than \$5,000 <input type="checkbox"/></p> <p>\$5,000 or more <input type="checkbox"/> \$ _____</p> <p>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).</p> | <p>13. Organizations</p> <p>EXPENSE relating to lobbying activities for this reporting period were:</p> <p>Less than \$5,000 <input type="checkbox"/></p> <p>\$5,000 or more <input checked="" type="checkbox"/> \$ <u>1,020,000.00</u></p> <p>14. REPORTING Check box to indicate expense accounting method. See instructions for description of options.</p> <p><input checked="" type="checkbox"/> Method A. Reporting amounts using LDA definitions only</p> <p><input type="checkbox"/> Method B. Reporting amounts under section 6033(b)(8) of the Internal Revenue Code</p> <p><input type="checkbox"/> Method C. Reporting amounts under section 162(e) of the Internal Revenue Code</p> |

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 9
Lobbying Report (Example 3)

| | |
|--|---|
| Clerk of the House of Representatives Legislative Resource Center 135 Cannon Building Washington, DC 20515 http://lobbyingdisclosure.house.gov | Secretary of the Senate Office of Public Records 232 Hart Building Washington, DC 20510 http://www.senate.gov/lobby |
|--|---|

LOBBYING REPORT

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

| | | | |
|---|--|---|-----------------------------------|
| 1. Registrant Name <input checked="" type="checkbox"/> Organization/Lobbying Firm <input type="checkbox"/> Self Employed Individual 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 Mrs. Jennifer Baker Reid | b. Telephone Number 2023938524 | c. E-mail jreid@thelaurinbakergroup.com | 5. Senate ID# 44914-152 |
| 7. Client Name <input type="checkbox"/> Self <input type="checkbox"/> 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 | |
|---|---|
| <p>12. Lobbying</p> <p>INCOME relating to lobbying activities for this reporting period was:</p> <p>Less than \$5,000 <input type="checkbox"/></p> <p>\$5,000 or more <input checked="" type="checkbox"/> \$ <u>20,000.00</u></p> <p>Provide a good faith estimate, rounded to the nearest \$10,000, of all lobbying related income for the client (including all payments to the registrant by any other entity for lobbying activities on behalf of the client).</p> | <p>13. Organizations</p> <p>EXPENSE relating to lobbying activities for this reporting period were:</p> <p>Less than \$5,000 <input type="checkbox"/></p> <p>\$5,000 or more <input type="checkbox"/> \$ _____</p> <p>14. REPORTING Check box to indicate expense accounting method. See instructions for description of options.</p> <p><input type="checkbox"/> Method A. Reporting amounts using LDA definitions only</p> <p><input type="checkbox"/> Method B. Reporting amounts under section 6033(b)(8) of the Internal Revenue Code</p> <p><input type="checkbox"/> Method C. Reporting amounts under section 162(e) of the Internal Revenue Code</p> |

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 10
Lobbying Report (Example 4)

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

LOBBYING REPORT

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

| | |
|--|--|
| 1. Registrant Name <input checked="" type="checkbox"/> Organization/Lobbying Firm <input type="checkbox"/> Self Employed Individual 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 Mr. Thomas M. Sneeringer | b. Telephone Number 2027836333 |
| c. E-mail jw lindsey@uss.com | 5. Senate ID# 71553-12 |
| 7. Client Name <input checked="" type="checkbox"/> Self <input type="checkbox"/> 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 | |
|--|--|
| <p>12. Lobbying</p> <p>INCOME relating to lobbying activities for this reporting period was:</p> <p>Less than \$5,000 <input type="checkbox"/></p> <p>\$5,000 or more <input type="checkbox"/> \$ _____</p> <p>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).</p> | <p>13. Organizations</p> <p>EXPENSE relating to lobbying activities for this reporting period were:</p> <p>Less than \$5,000 <input type="checkbox"/></p> <p>\$5,000 or more <input checked="" type="checkbox"/> \$ <u>800,000.00</u></p> <p>14. REPORTING Check box to indicate expense accounting method. See instructions for description of options.</p> <p><input type="checkbox"/> Method A. Reporting amounts using LDA definitions only</p> <p><input type="checkbox"/> Method B. Reporting amounts under section 6033(b)(8) of the Internal Revenue Code</p> <p><input checked="" type="checkbox"/> Method C. Reporting amounts under section 162(e) of the Internal Revenue Code</p> |

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 11
Lobbying Report (Example 5)

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

LOBBYING REPORT

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

| | | | |
|---|--|---|----------------------------------|
| 1. Registrant Name <input checked="" type="checkbox"/> Organization/Lobbying Firm <input type="checkbox"/> Self Employed Individual 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 Mrs. Alice Tornquist | b. Telephone Number 2022630024 | c. E-mail alicet@qualcomm.com | 5. Senate ID# 60674-12 |
| 7. Client Name <input checked="" type="checkbox"/> Self <input type="checkbox"/> 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 | 13. Organizations |
| INCOME relating to lobbying activities for this reporting period was: <u>Less than \$5,000</u> <input type="checkbox"/> <u>\$5,000 or more</u> <input type="checkbox"/> \$ _____ 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). | EXPENSE relating to lobbying activities for this reporting period were: <u>Less than \$5,000</u> <input type="checkbox"/> <u>\$5,000 or more</u> <input checked="" type="checkbox"/> \$ 1,730,000.00 14. REPORTING Check box to indicate expense accounting method. See instructions for description of options. <input checked="" type="checkbox"/> Method A. Reporting amounts using LDA definitions only <input type="checkbox"/> Method B. Reporting amounts under section 6033(b)(8) of the Internal Revenue Code <input type="checkbox"/> Method C. Reporting amounts under section 162(e) of the Internal Revenue Code |

Signature Digitally Signed By: 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

A-2 Construction of Control Variables

A-2.1 Firm-Level Controls

Using the Fundamentals segment of Compustat, we construct two measures of a firm's size:⁵⁵

$Employment_{f,t}$ 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 .

We define the following variables to capture a firm's participation in international trade:

$Exporter_{f,t}$ is a dummy variable equal to 1 if firm f reports either positive export sales or at least one foreign customer among their top clients in year t . This variable is constructed using data from different segments of Compustat. The Historical Segments provide information on export sales. Additional information about exports can be found in the Customer Segment, which gives the geographic location of a firm's top clients. Information on export sales and on the geographic location of a firm's clients is provided on a voluntary basis, and there are many missing values. Thus the variable $Exporter_{f,t}$ can only be defined for 21,779 observations (out of 114,412) of our matched sample.

$Importer_{f,t}$ is a dummy variable equal to 1 if firm f is an importer (of any product, from any country) in year t . Compustat does not provide any information on firms' imports or foreign suppliers. To identify importing firms, we use 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.⁵⁶ 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 of our matched sample.

$Multinational_{f,t}$ is a dummy variable equal to 1 if firm f reports positive foreign income taxes in year t . This variable is constructed using the information on the financial statements of firms and is meant to identify multinational corporations, which own or control production of goods or services in at least one country other than the United States. This variable can be defined for all observations in the matched sample.⁵⁷

$Internationalized_{f,t}$ is a dummy variable equal to 1 if any of the indicator variables for trade participation of firm f ($Multinational_{f,t}$, $Exporter_{f,t}$, $Importer_{f,t}$) is equal to 1 in year t .

⁵⁵These variables include sales and employees in all consolidated subsidiaries of the firm.

⁵⁶We thank Nitish Jain for providing us with the data to construct this variable.

⁵⁷This proxy for a firm's multinational status is justified by Section §210.4-08(h)(1) (*Income Tax Expense*) of the U.S. Securities and Exchange Commission (SEC) rules, which mandates the disclosure of the components of income as either domestic or foreign. The variable suffers from measurement error, since some foreign income may not be directly related to production activities of foreign affiliates (e.g. tax avoidance).

Table A-2 provides descriptive statistics on the firms lobbying on trade agreements. These tend to be large corporations: mean yearly sales and mean employment are respectively equal to 63.2 \$US billions and 159,000 employees. The overwhelming majority of firms that lobby on FTAs are also engaged in international trade: the dummy variables $Exporter_{f,t}$ and $Importer_{f,t}$ are equal to 1 for over 95% of the lobbying firms for which they can be defined; almost 85% of firms lobbying on trade agreements are multinationals and around 90% are internationalized in at least one dimension.

A-2.2 FTA-Level Controls

We define several variables capturing variation across FTAs in terms of their potential effects on firms' profits and politicians' support for their ratification. Descriptive statistics of the FTA variables are reported in Table A-3 of the Empirical Appendix.

Expected Effects of the FTA

We first construct variables that capture exogenous variation in the impact of trade agreements on a firm's potential gains (due to improved access to foreign consumers and suppliers) and losses (due to increased competition in the domestic market).⁵⁸ For a firm operating in sector j these are given by, these are given by $Improved\ access\ to\ foreign\ consumers_{j,a}$, $Improved\ access\ to\ foreign\ suppliers_{j,a}$, and $Increased\ competition\ in\ the\ domestic\ market_{j,a}$.

Below we describe the three steps we followed to construct these measures. The first step is the construction of variables capturing the extent to which an FTA, if it enters into force, will lead to tariff reductions affecting firms operating in industry j . As mentioned before, Article XXIV of the GATT/WTO requires that preferential trade agreements negotiated by the United States and other developed countries must reciprocally eliminate "duties and other restrictive regulations of commerce" on "substantially all the trade" among members. Thus the extent of tariff reductions triggered by the entry into force of an FTA depends on the Most Favored Nation (MFN) tariffs applied by the United States and its FTA partners vis-à-vis each other.⁵⁹ As pointed out by Alfaro *et al.* (2016), MFN tariffs emerge from long rounds of multilateral trade negotiation: at the end of each round, governments commit not to exceed certain tariff rates; tariff bindings can only be renegotiated in a new round. As a result, MFN tariffs are persistent, significantly more so than integration choices. For the firms included in our analysis, the prevailing tariffs resulted from the 8-year Uruguay Round of trade negotiation that was completed in 1994, before the passage of the Lobbying Disclosure Act. Secondly, they must be applied in a non-discriminatory

⁵⁸Looking at Table A-3, notice that the number of observations for these variables is smaller than for other FTA controls, due to missing tariff data for the US and its trading partners.

⁵⁹The source of the tariff data is the World Integrated Trade Solution (WITS) database. We use the Effectively Applied Tariffs in the year of the ratification of the agreement. The results are robust to constructing the FTA variables using earlier years. Before the agreement, US FTA partners always applied MFN tariffs on imports from the United States. In a few cases, the United applied lower-than-MFN (GSP) rates to imports from its FTA partners. For example, before the ratification of the CAFTA-DR agreement in 2005, the United States applied a tariff of 87.5% on imports of smoking Tobacco (HS240310) from the Dominican Republic, which was below the 350% MFN rate. Our results are robust to dropping those cases or replacing GSP tariff rates with the corresponding MFN rates.

manner to imports from all countries, which severely limits negotiators' flexibility to respond to lobbying. If they consequently, if they respond to short-term political pressure, governments find it much less costly to resort to non-tariff measures for regulating imports, such as antidumping and countervailing duties (e.g. Finger *et al.*, 1982; Bown *et al.*, 2021). Combining tariff data with data on input-output linkages, we construct the following variables:

Tariff applied by FTA partner on final good $_{j,a}$: this is the tariff faced by firms operating in sector j when exporting to the FTA partner(s), before the ratification of agreement a .

Tariff applied by US on inputs $_{j,a}$: this is the tariff faced by firms operating in sector j when importing their inputs from the FTA partner(s), before the ratification of agreement a . To identify the relevant inputs, we use detailed input-output data from the Bureau of Economic Analysis (BEA), in line with recent studies (e.g. Alfaro *et al.*, 2016 and 2019; Bown *et al.*, 2021).⁶⁰ 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 .⁶¹ For every firm producing good j , we focus on its top 100 inputs i as ranked by 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.

Tariff applied by US on final good $_{j,a}$: this is the tariff applied by the US on imports in sector 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). We construct three versions of the variables above, based on the average tariffs, average weighted tariffs, and maximum tariffs applied in a SIC4 sector. In Table A-3 we report descriptive statistics for this last version of the tariff variables. These show that the United States tends to apply lower tariffs before the agreement than its FTA partners,⁶² and that input tariffs tend to be lower than tariffs on final goods.⁶³

⁶⁰Benchmark 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.

⁶¹Using 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.

⁶²There 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.

⁶³The 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 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 final good $_{j,a}$*).

In a second step, we construct measures capturing exogenous variation in the size of the partner(s) of an FTA. All variables are constructed using pre-agreement data.⁶⁴

GDP of FTA partner_a is the GDP of the partner(s) of agreement *a* (in millions of US dollars).

Export potential of FTA partner_{j,a} measures US exports in industry *j* to the partner(s) of agreement *a* (in millions of US dollars).

Sourcing potential of FTA partner_{j,a} measures US imports of inputs used by industry *j* from the partner(s) of agreement *a* (in millions of US dollars). To identify the relevant inputs, we use input-output tables from the BEA (see description of the variable *Tariff applied by US on inputs_{j,a}* above).

Competition from FTA partner_{j,a} measures US imports in sector *j* from the partner(s) of agreement *a* (in millions of US dollars).

In the third step, we combine the measures described above to construct variables that capture exogenous variation in the impact of trade agreements on a firm's potential gains (due to improved access to foreign consumers and suppliers) and losses (due to increased competition in the domestic market).⁶⁵ For a firm operating in industry *j* these are given by:

Improved access to foreign consumers_{1,j,a} (*Improved access to foreign consumers_{2,j,a}*) is the multiplication between *Tariff applied by FTA partner on final good_{j,a}* and *GDP of FTA partner_a* (*Export potential of FTA partner_{j,a}*).

Improved access to foreign suppliers_{1,j,a} (*Improved access to foreign suppliers_{2,j,a}*) is the multiplication between *Tariff applied by US on inputs_{j,a}* and *GDP of FTA partner_a* (*Sourcing potential of FTA partner_{j,a}*).

Increased competition in the domestic market_{1,j,a} (*Increased competition in the domestic market_{2,j,a}*) is the multiplication between *Tariff applied by US on final good_{j,a}* and *GDP of FTA partner_a* (*Competition from FTA partner_{j,a}*).

Expected Political Support for FTAs

We construct different variables to capture exogenous variation in expected political support for FTAs from the point of view of firms lobbying on the ratification of these agreements.

Expected political support for trade FTAs should 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

⁶⁴With the exception of *GDP of FTA partner_a*, which is constructed using data from the World Bank, these variables are constructed using information from the US Census.

⁶⁵Looking at Table A-3, notice that the number of observations for these variables is smaller than for other FTA controls, due to missing tariff data for the US and its trading partners.

likely to support the ratification of trade agreements. For example, 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 percent.

Political support for trade FTAs should also depend on Congress composition. During our sample period, Democrats were systematically more protectionist than Republicans (e.g. Baldwin and Magee 2000; Hiscox 2004; Conconi *et al.*, 2014; Irwin, 2017). For example, using trade votes cast during 1973-2005, Conconi *et al.* (2014) find that membership in the Democratic party decreases the probability that congressmen support trade liberalization by more than 40 percent. Irwin (2017) documents that, during the 1993-2015 period, Democrats were significantly less likely to vote pro-trade than Republicans. From the point of view of firms in our lobbying dataset, expected political support for FTAs should be lower when a larger share of US congressmen belong to the Democratic party.

We define the following variables:

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.

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.

A-3 Robustness Checks

Table A-4
Probability of lobbying on FTAs and firm size (probit model)

| | (1) | (2) |
|--|----------------------|----------------------|
| log(Employment _{<i>f,t</i>}) | 0.004*** (0.0003) | |
| log(Sales _{<i>f,t</i>}) | | 0.004*** (0.0010) |
| FTA FE | Yes | Yes |
| Sector 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* operating in sector *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*. Sector fixed effects defined at the SIC2 level. Standard errors in parenthesis clustered at the FTA-SIC1 level. Significance levels: *, 10%; **, 5%; ***, 1%.

Table A-5
Probability of lobbying on FTAs and firm internationalization (probit model)

| | (1) | (2) | (3) | (4) |
|---|---------------------|--------------------|----------------------|----------------------|
| Exporter _{<i>f,t</i>} | 0.013** (0.0058) | | | |
| Importer _{<i>f,t</i>} | | 0.024* (0.0138) | | |
| Multinational _{<i>f,t</i>} | | | 0.007*** (0.0021) | |
| Internationalized _{<i>f,t</i>} | | | | 0.008*** (0.0025) |
| FTA FE | Yes | Yes | Yes | Yes |
| Sector FE | Yes | Yes | Yes | Yes |
| Observations | 12,941 | 6,220 | 78,263 | 78,263 |
| Pseudo R ² | 0.197 | 0.212 | 0.258 | 0.254 |
| Predicted probability | 0.0104 | 0.0180 | 0.0032 | 0.0032 |

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* operating in sector *j* lobbies on the ratification of agreement *a* in year *t*. *Exporter*_{*f,t*} (*Importer*_{*f,t*}) is a dummy variable equal to 1 if firm *f* exports (imports) in year *t*. *Multinational*_{*f,t*} is a dummy variable equal to 1 if firm *f* reports positive foreign income taxes. *Internationalized*_{*f,t*} is a dummy variable equal to 1 if firm *f* is an exporter, and importer, or a multinational in year *t*. Sector fixed effects defined at the SIC2 level. Standard errors in parenthesis clustered at the FTA-SIC1 level. Significance levels: *, 10%; **, 5%; ***, 1%.

Table A-6
Number of reports on FTAs and expected gains from the agreements

| | (1) | (2) | (3) | (4) | (5) | (6) |
|--|----------------------|----------------------|----------------------|---------------------|----------------------|---------------------|
| log(Improved access to foreign consumers $1_{j,a}$) | 0.011** (0.0046) | 0.010** (0.0042) | 0.010** (0.0044) | | | |
| log(Improved access to foreign suppliers $1_{j,a}$) | 0.021** (0.0519) | 0.022** (0.0452) | 0.023** (0.0570) | | | |
| log(Increased competition in the domestic market $1_{j,a}$) | -0.011** (0.0046) | -0.014** (0.0050) | -0.009** (0.0042) | | | |
| log(Improved access to foreign consumers $2_{j,a}$) | | | | 0.013** (0.0051) | 0.013** (0.0048) | 0.012** (0.0046) |
| log(Improved access to foreign suppliers $2_{j,a}$) | | | | 0.020** (0.0093) | 0.023** (0.0093) | 0.020** (0.0095) |
| log(Increased competition in the domestic market $2_{j,a}$) | | | | -0.013* (0.0067) | -0.017** (0.0069) | -0.011* (0.0056) |
| Firm FE | Yes | Yes | Yes | Yes | Yes | Yes |
| Year FE | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 651 | 651 | 651 | 606 | 606 | 606 |
| R ² | 0.229 | 0.229 | 0.231 | 0.233 | 0.233 | 0.235 |

The table reports the coefficients of OLS regressions. The dependent variable is the log of *Lobbying reports on FTA* $f(j),a,t$, the number of reports filed by firm f (operating in sector j) 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). *Improved access to foreign consumers* $1_{j,a}$ is the multiplication between *Tariff applied by FTA partner on final good* j,a and *GDP of FTA partner* a . *Improved access to foreign suppliers* $1_{j,a}$ is the multiplication between *Tariff applied by US on inputs* j,a and *GDP of FTA partner* a . *Increased competition in the domestic market* $1_{j,a}$ is the multiplication between *Tariff applied by US on final good* j,a and *GDP of FTA partner* a . *Improved access to foreign consumers* $2_{j,a}$ is the multiplication between *Tariff applied by FTA partner on final good* j,a and *Export potential of FTA partner* j,a . *Improved access to foreign suppliers* $2_{j,a}$ is the multiplication between *Tariff applied by US on inputs* j,a and *Sourcing potential of FTA partner* j,a . *Increased competition in the domestic market* $2_{j,a}$ is the multiplication between *Tariff applied by US on final good* j,a and *Competition from FTA partner* j,a . In columns 1 and 4, the variables are constructed using data on average tariffs, in columns 2 and 5 using data on average weighted tariffs, and in columns 3 and 6 using data on maximum tariffs. Standard errors in parenthesis clustered at the FTA-SIC1 level. Significance levels: *, 10%; **, 5%; ***, 1%.

Table A-7
Number of reports on FTAs and expected political support for the agreements

| | (1) | (2) | (3) | (4) |
|--|----------------------|----------------------|---------------------|---------------------|
| Divided Government1 _a | 0.214*** (0.0470) | | | |
| Divided Government2 _a | | 0.303*** (0.0922) | | |
| Share of Democrats in Congress1 _a | | | 2.606** (1.1896) | |
| Share of Democrats in Congress2 _a | | | | 2.733** (1.1795) |
| Firm FE | Yes | Yes | Yes | Yes |
| Year FE | Yes | Yes | Yes | Yes |
| Observatiob | 1,821 | 1,821 | 1,821 | 1,821 |
| R ² | 0.110 | 0.111 | 0.097 | 0.098 |

The table reports the coefficients of OLS regressions. The dependent variable is the log of *Lobbying reports on FTA*_{f(j),a,t}, the number of reports filed by firm *f* (operating in sector *j*) in year *t* to lobby in support of 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. *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*). Standard errors in parenthesis clustered at the FTA-SIC1 level. Significance levels: *; 10%; **: 5%; ***: 1%.

B. Theoretical Appendix

B-1 Distributional Effects of an FTA

In this first section of the Theoretical Appendix, we consider the effects of the trade agreement between two symmetric countries, Home and Foreign, which leads to the reciprocal elimination of tariffs in all sectors. We use a * to denote variables related to Foreign. We later show that our results carry through if we allow for asymmetries across countries. All the key results also continue to hold if we consider a three-country setting.

In Section B-1.1, we consider the canonical model of firm heterogeneity under monopolistic competition (Melitz, 2003). We show that the entry into force of the 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 Section B-1.2, we show that the key insights of Melitz (2003) about the distributional effects of an FTA can be extended to models of oligopolistic competition.

B-1.1 Monopolistic competition

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 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:

$$U(q_0, Q_{1,\dots,J}) = q_0 + \sum_{j=1}^J u(Q_j), \quad (16)$$

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

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 $F_D > (1 + t)^{1-\sigma} F_X$.⁶⁶

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

$$\Pi_i = \frac{1}{\sigma} (\rho\mathcal{P}\varphi_i)^{\sigma-1} - F_D + \left(\frac{1}{\sigma} \left(\frac{\rho\mathcal{P}\varphi_i}{(1+t)} \right)^{\sigma-1} - F_X \right) \mathbf{1}_X(i), \quad (17)$$

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 $\Theta(t) := \mathcal{P}^{\sigma-1} (1 + (1+t)^{1-\sigma})$ 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.

As mentioned before, 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 (17), note that overall exporters' profits are supermodular in market access $(1+t)^{-1}$ and productivity φ_i . Formally,

$$\frac{d^2\Pi_i}{d\varphi_i d[(1+t)^{-1}] > 0. \quad (18)$$

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

⁶⁶The 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 ($t = t^* = 0$).

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 scenario, this firm is forced to exit the market incurring a loss equal to $\min_i \Delta\Pi_i = -\frac{1}{\sigma} (\rho\mathcal{P}\varphi_{X0})^{\sigma-1} < 0$.

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. The intuition behind this result is that firms that gain most from an FTA are those which are both large and export-intensive. In absolute terms, the maximum losses of a non-exporting firm ($\min_i \Delta\Pi_i$) are much smaller than the maximum gains that can be reaped by superstar exporters $\max_i \Delta\Pi_i$.

B-1.2 Oligopolistic competition

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 next consider a model with heterogeneous oligopolistic firms and endogenous entry and 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.

As in the benchmark economic structure described in Section B-1.1, 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 $1, \dots, J$ goods produced by heterogeneous oligopolistic firms.⁶⁷

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 $1 \dots J/2$ (i.e. $\lambda_j \geq 0$), while Foreign has a comparative advantage in the remaining $J/2+1 \dots J$ (i.e. $\lambda_j \leq 0$). 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.⁶⁸ In

⁶⁷We 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.

⁶⁸We could assume that productivities are random draws from a (Pareto or log-normal) distribution, as in standard

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. $c_{ji} = c_{j1} + (i - 1)\delta$.⁶⁹

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).

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 $c_{j1}^* + t_j > \bar{c}_j$).

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

$$\frac{\alpha - c_{j1}}{\delta} = \left(\frac{N_j + 3}{2} \right) N_j. \quad (19)$$

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).

Equilibrium profits of each firm i are given by

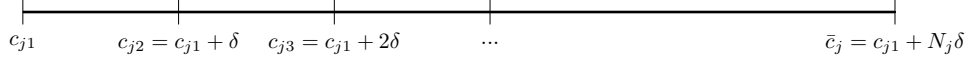
$$\Pi_{ji} = \frac{1}{2}(\bar{c}_j - c_{ji})^2. \quad (20)$$

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

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.

⁶⁹With 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



left. This leads to an increase in the number of firms operating in the sector.⁷⁰ Each firm in the new equilibrium is more productive and makes higher profits.⁷¹ Thus, in sectors where the technological leader is more productive, the i^{th} firm is also more profitable.

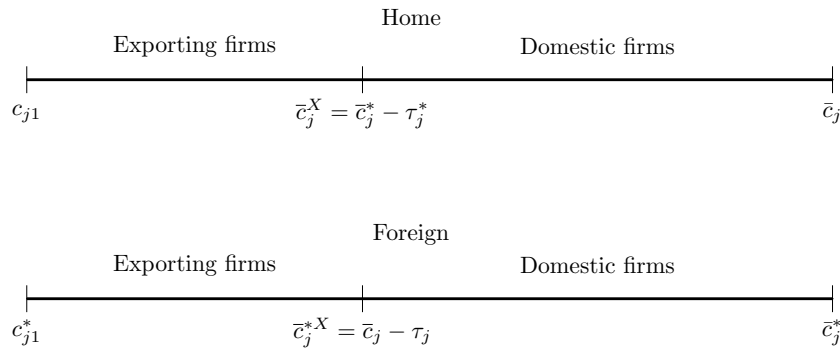
Open Economy: No Cross-Country Differences in Technology

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.

Consider a sector j with no cross-country 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 $c_{ji} \leq \bar{c}_j^X \equiv \bar{c}_j^* - \tau_j^*$. Similarly, a Foreign firm i will export iff $c_{ji}^* \leq \bar{c}_j^{X*} \equiv \bar{c}_j - t_j$.

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

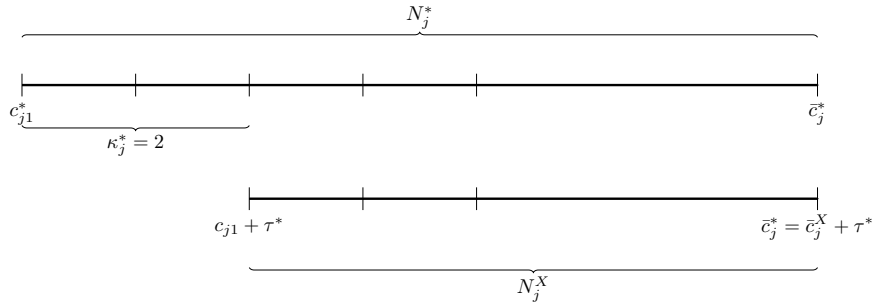
⁷⁰From (19), we can see that when c_{j1} falls, the right-hand side of the equation must increase.

⁷¹The 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.

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

$$\left(\frac{\alpha - c_{j1}^*}{\delta} \right) = (N_j^* + 2 - \kappa_j^*) N_j^* + \left(\frac{\kappa_j^* + 1}{2} \right) \kappa_j^*. \quad (21)$$

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

$$\left(\frac{\alpha - c_{j1}}{\delta_j} \right) = (N_j + 2 - \kappa_j) N_j + \left(\frac{\kappa_j + 1}{2} \right) \kappa_j. \quad (22)$$

The profits of a Home firm i are given by

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

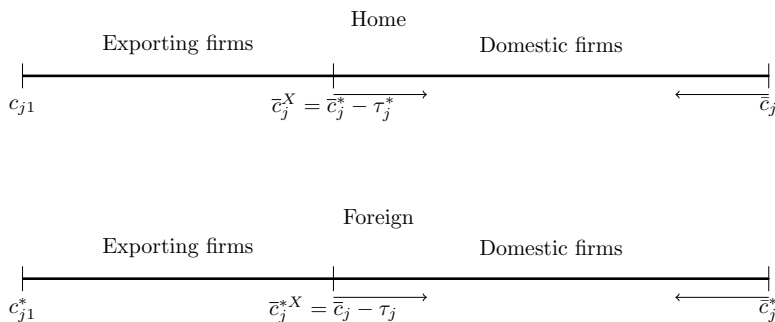
and symmetrically for a Foreign firm i ,

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

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 (21) and (22) 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).

Open Economy: 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 $\kappa_j^* = \frac{t_j^* - \lambda_j}{\delta}$.⁷²

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

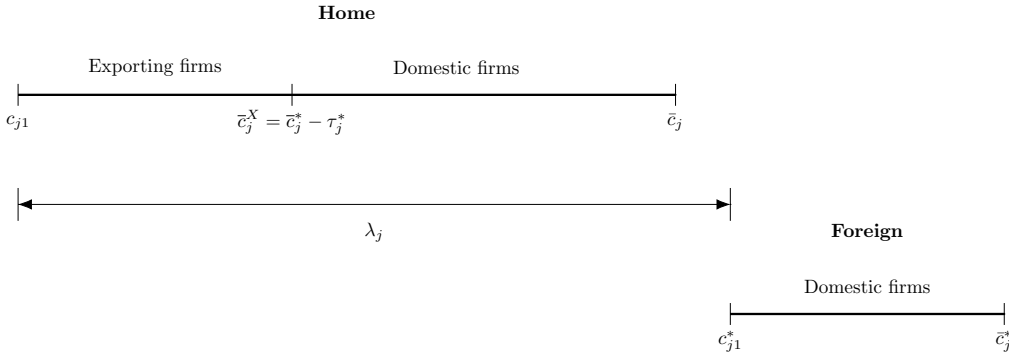
⁷²Thus the Home leader makes the same profits in the Foreign market as the $\kappa_j^* + 1$ most productive Foreign firm. For a given $t_j^* > 0$, having a cost advantage $\lambda_j > 0$ increases competition in the Foreign market. For a large enough λ_j , κ_j^* can be negative, in which case the most productive Home firm makes larger profits abroad than the most productive Foreign firm.

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

$$\lambda_j > \bar{\lambda}_j \equiv N_j \delta, \quad (23)$$

where N_j is the solution to (19). Figure B-6 illustrates the distribution of marginal costs of Home and Foreign firms when $\lambda_j > \bar{\lambda}_j$ and $\kappa_j^* > 0$.

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

$$\Pi_{ji} = \frac{1}{2}(\bar{c}_j - c_{ji})^2 + \frac{1}{2}(\bar{c}_j^* - c_{ji} - t_j^*)^2 \mathbf{1}_{c_{ji} + t_j^* \leq \bar{c}_j^*}, \quad (24)$$

while Foreign firms earn

$$\Pi_{ji}^* = \frac{1}{2}(\bar{c}_j^* - c_{ji}^*)^2. \quad (25)$$

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.

Distributional Effects of an 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.⁷³

⁷³For 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 ($t_j = t_j^* = 0$).

Non-exporting Home firms always lose from the FTA:

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

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 $j \in (1, \dots, J/2)$ 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 $j' \in (J/2 + 1, \dots, J)$, 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: $\Delta\Pi_{j'1} = -\frac{1}{2}(\bar{c}_{j'} - c_{j'1})^2 < 0$.

As in the canonical Melitz (2003) model of firm heterogeneity, 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' ($|\Delta\Pi_{j1}| > |\Delta\Pi_{j'1}|$). This follows directly from the higher productivity of the "global leader" ($\bar{c}_{j1} < \bar{c}_{j'1}$).⁷⁴ Thus the biggest winners from the FTA have higher stakes in the agreement than the biggest losers.

⁷⁴Pre-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 Firm Lobbying on FTAs: Extensive Margin

B-2.1 Lemmas 1-3

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

$$v'(\hat{l}_f) \mathbb{E} \left[\frac{\hat{\mathcal{L}}_A + B^-}{\left(\hat{\mathcal{L}}_P + \hat{\mathcal{L}}_{A+} + |B| \right)^2} \right] \cdot \mathbb{E}[P^*] \cdot \Delta\Pi_f = 1. \quad (26)$$

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 (26), 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. 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 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

$$\max_{l_g \geq 0} \left(\mathbb{E}[P(\hat{\mathcal{L}}_P + v(l_g), \hat{\mathcal{L}}_A, B)] - \mathbb{E}[P(\hat{\mathcal{L}}_P, \hat{\mathcal{L}}_A, B)] \right) \cdot \mathbb{E}[P^*] \cdot \Delta\Pi_g - l_g. \quad (27)$$

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 (26) for lobbying firm f . Given that $v''(\cdot) < 0$, and that $\Delta\Pi_g > \Delta\Pi_f$, if the marginal return to lobbying for firm f at $l_f = 0$ is strictly bigger than 1, it must be the case that firm g lobbies 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. 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 ??). Now at a given equilibrium, consider a unilateral deviation in which firm f reduces its expenditure and sets $l_f = \hat{l}_g$. The payoff from lobbying of firm f is then

$$\mathbb{E} \left[\frac{(\hat{\mathcal{L}}_A + B^-) v(\hat{l}_g)}{(\hat{\mathcal{L}}_P + v(\hat{l}_g) - v(\hat{l}_f) + \hat{\mathcal{L}}_{A+} | B |) (\hat{\mathcal{L}}_P - v(\hat{l}_f) + \hat{\mathcal{L}}_{A+} | B |)} \right] \cdot \mathbb{E} [P^*(\mathbf{1}, B^*)] \Delta\Pi_f - \hat{l}_g.$$

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. It follows that, comparing lobbying firms at a given equilibrium, a firm that has more to gain from the FTA has also more to gain from lobbying:

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

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

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

B-4 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) (or equivalently 9)) 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.⁷⁵ We fix the probability of ratification of the FTA by the Foreign country to $\mathbb{E}[P^*(\mathbf{1}, B^*)]$. Maximizing the joint expected payoff across lobbyists comes down to

$$\max_{\mathbf{l} \in \mathbb{R}^N} \mathbb{E} \left[\frac{\mathcal{L}_P + B^+}{\mathcal{L}_P + |B|} \right] \cdot \mathbb{E}[P^*(\mathbf{1}, B^*)] \left(\sum_{f \in \Omega_L} \Delta \Pi_f \right) - \sum_{f \in \Omega_L} l_f.$$

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

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

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

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

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

⁷⁵In this formulation, a firm that does not lobby does not benefit from a potential FTA, i.e. its payoff is set to 0.