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New trade, new politics: intra-industry trade and domestic political coalitions

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ABSTRACT

Why are industries highly active in some battles over international trade policies, but in other instances, individual firms are highly active and industry groups are subdued? I argue that rising intra-industry trade in the postwar period has undermined traditional trade coalitions and created new opportunities for individual firms to become politically active. Drawing on new trade theories from economics, as well as work on firm heterogeneity and lobbying, I argue that industry associations become less active as intra-industry trade increases due to competing trade preferences among member firms. At the same time, individual firms become more politically active. My results suggest that firms lobby not only for protection, but liberalization. Using data on lobbying expenditures in the USA, my work takes recent analyses of intra-industry trade and lobbying a step further. I show how intra-industry trade redraws domestic political alignments and changes the composition of societal coalitions organized to influence trade policy.

KEYWORDS

international trade; intra-industry trade; lobbying; political coalitions; interest groups; developed economies.

1. INTRODUCTION

Why do firms sometimes lobby alone over trade policy, and why do they sometimes lobby as an industry through their trade association? The landscape of societal coalitions organized to influence trade policy has varied significantly across time and place. In many advanced industrial democracies, broad class-based coalitions composed of workers or employers from a wide range of industries have given way to narrow industry-based coalitions. Still other firms forego collective action

entirely, lobbying alone on behalf of their own interests. In the USA, individual firms now spend more money in politics than business coalitions and/or industry associations (Drope and Hansen 2009: 306). Leading models of trade politics such as the Stolper–Samuelson and Ricardo–Viner theorems expect firms and workers to form broad class-based or narrow industry-based coalitions, respectively. In this study, I contribute to a nascent but rapidly growing political science literature on trade politics that draws on newer models of international trade better suited to contemporary empirical realities. My approach shows why industry associations remain highly active in some industries, while they have become largely inactive in other industries, paving the way for firm-level political activity. I argue that industry associations become less active as intra-industry trade (IIT) increases, due to competing trade preferences among member firms. At the same time, individual firms become more politically active.

I draw from models of international trade first developed by economists in the late 1970s and early 1980s to explain what at the time was a puzzling empirical fact: in the advanced economies, trade in the postwar period became increasingly intra-industry rather than inter-industry (OECD Economic Outlook 2002).¹ IIT occurs when a country exports certain varieties of a type of good and imports other varieties of the same type of good. As defined by Krugman (1981), IIT ‘consists of two-way international trade within an industry because firms in different countries will produce different differentiated products’.² IIT is driven by two related features of modern production and consumption: increasing returns to scale and consumers’ love of variety. When domestic firms specialize in a subset of products in order to enjoy productivity gains from economies of scale, consumers will demand access to other varieties that are only produced abroad (Dixit and Norman 1980; Helpman 1981; Krugman 1979). This firm specialization and consumer demand create broad support for trade in differentiated products. Two examples of industries subject to high IIT in the advanced economies are the automobile and pharmaceutical industries. There are many varieties of cars, and many different types of pharmaceutical products, and no single country can produce the full range of these varieties, generating consumer demand for access to varieties produced abroad.

Several factors motivate this research. First, empirical patterns in international trade have changed substantially in recent decades, and IIT has grown to account for as much as 50% of total global trade.³ It is important that political models of trade keep pace with empirical developments as well as theoretical innovations in trade theory. Second, enormous amounts of money are spent lobbying over trade policy, underscoring the continued importance of research aimed at understanding these

dynamics. In 2013, US companies, industry groups and hired lobbyists reported over a billion dollars of spending on lobbying reports that mentioned trade policy as a key issue, among other issues.⁴ Third, several recent trade agreements have been concluded while others languish due to strong opposition from societal stakeholders. A focus on the structure of trade – whether it is intra- or inter-industry – can help make sense of this puzzle.

This study proceeds as follows. First, I discuss the economics of intra-industry trade. Second, I review the state of the literature on the politics of intra-industry trade, and I discuss the contributions of the present paper. Third, I present a theory of the way IIT affects the trade preferences of firms and their ability to engage in collective action to influence trade policy. Fourth, I generate specific expectations of the extent to which firms and industry associations will lobby over trade when trade is primarily intra-industry. Fifth, I test my expectations using lobbying data from US manufacturing industries. Finally, I discuss my results and conclude.

2. THE ECONOMICS OF INTRA-INDUSTRY TRADE

During the first wave of globalization starting in the mid-nineteenth century, international trade was primarily driven by comparative advantage, and as a result, trade patterns were heavily *inter*-industry, as the United States and the industrializing countries of Europe imported raw materials from less developed economies and exported manufactured goods such as textiles, clothing, ships, railroad materials as well as ‘new’ industrial goods such as chemicals and steel. During the second wave of globalization after World War II, trade patterns changed significantly. The USA and the countries of Western Europe committed to substantial multilateral trade liberalization among themselves, through the General Agreement on Tariffs and Trade as well as the construction of the European Community. As a result, North–North two-way trade in manufactured goods grew in importance, and IIT began to represent a substantial proportion of total trade among the industrialized economies. By 1996, 83.4% of European exports were destined for Europe or North America, compared to 75.5% in 1910 (Baldwin and Martin 1999). [Figure 1](#) shows that by 2005, IIT accounted for more than half of all US trade in manufactures.⁵

What are the economic effects of intra-industry trade? Conventional wisdom is that the adjustment costs of IIT are lower than endowment-based trade. Because IIT most often occurs between high-income countries with similar factor endowments, entire sectors are not shut down or reallocated as a result of this trade. The more similar two countries are in terms of their endowments, and the more balanced they are in terms of

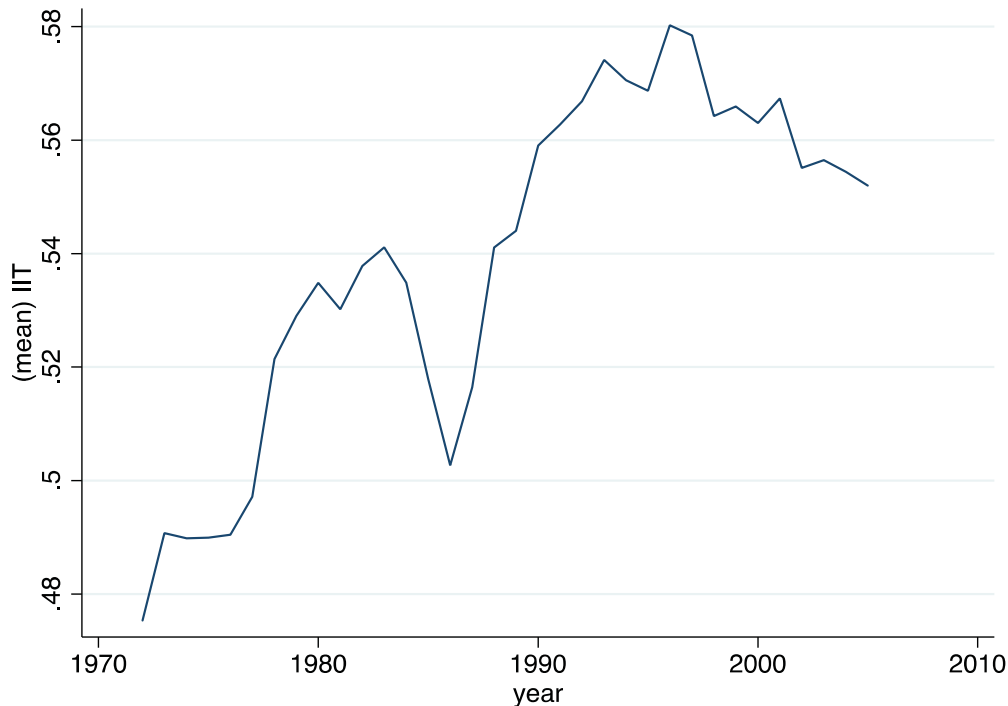


Figure 1 Average level of IIT for US manufacturing sectors, 1972–2005. *Source:* Schott (2010) data. For each year between 1972 and 2005, there is data for between 402 and 448 manufacturing categories, defined at the four-digit SIC level. See Schott (2010) for further data information.

competitiveness, the less likely is IIT to lead to losses for a particular factor or sector. The less similar the trading countries are, the more likely that an entire factor will lose or an entire sector will be shut down. In theory, since all the trading firms produce a different variety of goods, each can continue to produce and export under open trade, without any being forced out of business. According to several leading political economists, this type of trade has ‘neutral consequences for income distribution and the possibility that everyone gains from increased trade through the expanded number of products available’ (Alt et al. 1996). Krugman (1981) argues that as long as the trading countries are sufficiently similar in endowments, any income distribution effects of IIT are offset by the gains to firms, workers and consumers as a whole.

However, this harmonious view of IIT has been challenged by recent literature with access to newer firm-level data. Scholars working in what is sometimes termed the new–new trade theory argue that there are real losers of trade in similar products, and these losers are individual firms. While IIT does not reallocate resources away from an entire industry, it does reallocate resources away from less productive to more productive firms within a given industry (Melitz 2003; Trefler 2004; Bernard et al.

2007). Assuming that trade liberalization is reciprocated by trading partners, IIT is likely to benefit the most productive firms that can compete successfully both in export markets and in the newly liberalized domestic market, while less productive firms are unlikely to export and also face intensified pressure from imports. Without trade protection, many inefficient firms are forced to exit. Though political economists frequently speak of 'export sectors', the new firm heterogeneity literature emphasizes the fact that within these sectors, only a small percentage of firms actually export (Bernard et al. 2003; Mayer and Ottaviano 2008; Melitz 2003). The majority of firms are small, non-exporting and less productive. IIT places considerable pressure on these firms. Greater exposure to trade forces many smaller firms to exit and it decreases the number of domestic firms within an industry, while raising the overall productivity of the industry by reallocating resources toward the more productive firms (Melitz 2003). The effect of IIT on wages is not uniform either. Studies show that IIT raises wages in exporting firms while lowering wages in the least productive, domestic-oriented firms (Amiti and Davis 2012).

This is the interesting aspect of IIT for political economists: IIT does not have the same distributional consequences that endowment-based trade does. As a whole, IIT enhances the welfare of the economy by increasing the size of the market, reallocating productive factors toward the most productive firms, raising wages in the most productive firms, and providing greater product variety for consumers. However, it increases competition among producers and can, therefore, drive less competitive firms to exit. Smaller firms that do not export, and their workers, are likely to be the primary losers when trade agreements lead to increased IIT. In this analysis, I argue that changes in the structure of trade away from inter-industry trade based on comparative advantage and toward IIT have generated conflicting trade preferences among firms in the same industry, undermining consensus within industry associations and encouraging individual firms to lobby alone.

3. RELATED LITERATURE: THE POLITICS OF INTRA-INDUSTRY TRADE

Most canonical political science work on the 'demand side' of trade politics is grounded in classic trade theory, which expects countries will exchange primarily along inter-industry lines and the redistributive effects of trade will affect either entire classes or specific industries. Leading studies such as Rogowski (1989), Frieden (1992) and Hiscox (2002b) are based on these assumptions, as well as the numerous studies that have built on their theoretical and empirical contributions.⁶ These studies are similar in that they expect coalitions to form among economic actors with shared preferences over trade policy outcomes, yet they differ in

their expectations about whether coalitions will be broad and class-based (for example, labor unions or cross-sectoral business associations) or narrow and industry-based (for example, industry associations). Factor mobility is argued to play a central role in determining these coalition patterns.⁷

Two major limitations of the factor/sector-based approaches above are that (1) their assumptions are based on inter-industry, comparative advantage-based trade models that are less relevant in today's advanced economies where trade is largely intra-industry, and (2) they assume firms will organize themselves into coalitions of various forms, ignoring the possibility of counter-coalitional political activity by individual firms. To address these issues, the most recent 'demand side' models of trade politics draw on a central finding of new–new trade theory, as discussed above: IIT reallocates resources not at the industry level, but at the firm level. Productive, exporting firms within an industry stand to gain from trade liberalization while less productive, typically non-exporting firms expect to lose. These models use firm heterogeneity as a central factor in explanations of why some firms prefer trade liberalization while others in the same industry prefer protection.

The firm heterogeneity literature takes as its starting point the fact that within any given industry, firms differ from each other in a number of important ways that affect their engagement with the global economy, their trade preferences and their political behavior. For example, only a small percentage of firms export and/or import. This 'heterogeneity' of firms' exporting/importing status means even firms within the same industry are not likely to benefit in a uniform way from trade liberalization. This, in turn, means that they may not be united as an industry on trade policy. Several recent studies emphasize how firm characteristics can better explain trade preferences – and lobbying behavior – than industry characteristics. Osgood et al. (2016) and Plouffe (2016) both use survey evidence to show that exporting firms are more likely to prefer trade liberalization than non-exporting firms. Plouffe (2014) and Kim (2013) find that only highly productive firms are likely to lobby for trade liberalization, while Osgood (2016a) argues that the most productive firms may actually oppose increased liberalization of a partially open economy, as their slightly less productive compatriots are likely to be the primary beneficiaries of increased foreign market access. Osgood also argues that in industries with high product differentiation, where there are many different varieties of the same type of good, firms tend to have opposing trade preferences. Complementing this, Kim (2013) demonstrates empirically that when product differentiation is high, firms are more likely to lobby for tariff reductions. Jensen et al. (2015b) find that US firms engaged in foreign direct investment are less likely to file anti-dumping complaints against the countries where they have invested.⁸

Taken together, these contributions show how firm-level differences are central to understanding trade politics. The present analysis complements this work by linking firm heterogeneity not only with firm-level lobbying but also with industry-level political organization.

Demand-side models of trade politics must also consider the fact that lobbying is costly, and industries may face collective action problems in their attempts to organize politically. In general, larger firms are more likely to lobby individually than smaller firms (Bombardini 2008; Drope and Hansen 2006; Hansen and Mitchell 2000), while smaller firms are more likely to channel their political activity through associations (Kerr et al. 2013). Thus, many studies have investigated the relationship between firm-level political activity and industry concentration, which refers to the extent to which an industry's production is concentrated into the hands of a few large firms. These studies evaluate the Olsonian argument that members of smaller groups (fewer firms in the industry) will be more politically active, as they are better able to overcome the free-rider problem. In less concentrated industries characterized by a larger number of smaller firms, firms may be more likely to lobby together through trade associations (Bombardini and Trebbi 2012). Drope and Hansen (2009) find the opposite, however, and in general results of studies attempting to link industry concentration with mode of lobbying are quite mixed. Hansen et al. (2005) present a thorough review of these studies, their methodologies and their findings. I do not attempt to recreate it here.

However, the decision to lobby together or alone is also complicated by whether trade policy is conceived of as a public or a private good. When IIT is high, product differentiation also tends to be high and there are many different varieties of a particular product available to consumers. Gilligan (1997a) argues that individual firms then have an incentive to lobby for protection against particular foreign varieties that are most similar to their own product. Trade policy essentially becomes a private good. Bombardini and Trebbi (2012) also model trade policy as a private good, finding that when product differentiation is high, firms tend to lobby alone for product-specific protection, rather than collectively for industry-wide protection. The present analysis departs from these studies in an important way. Unlike both studies, I argue that IIT incentivizes not only protectionist lobbying, but also pro-trade lobbying by internationalized firms (importers seeking lower cost inputs and exporters lobbying strategically for liberalization in order to secure reciprocal liberalization in their export markets). This focus on the heterogeneous implications of trade is consistent with the recent focus in the trade literature on exporter lobbying (Destler et al. 1987; Milner 1988; Gilligan 1997b; Plouffe 2014; Kim 2013).⁹

While the works discussed above rely on various industry and firm characteristics to explain trade preferences, political behavior and trade policy outcomes, the present study builds on their contributions in several

ways. First, a focus on IIT has the advantage of being better able to explain variation in political support for different trade agreements. Some trade agreements (such as NAFTA or the Trans-Pacific Partnership) are hotly contested, marked by strong labor and broader public opposition, while most are far less politically salient (Guisinger 2009; Taylor 2015). This is because firm, industry and labor preferences over trade are not always intrinsic to particular firm or industry characteristics. Firm preferences about trade liberalization may change depending on the particular trade agreement under negotiation, which means that political behavior is also likely to change. I show in this paper why trade agreements between countries with higher levels of IIT are less likely to inspire widespread public and labor opposition than trade agreements between countries with greater inter-industry trade. By controlling for industry characteristics like average firm size, industry concentration and product differentiation, I am able to show how the structure of trade between countries – whether it is primarily intra- or inter-industry trade – strongly affects the extent to which political activity is primarily undertaken by individual corporate actors rather than broader societal interest groups. This, in turn, affects the likelihood of successful passage of a trade agreement.¹⁰

Second, my approach complements but departs from recent contributions to the firm heterogeneity literature by emphasizing the importance of international-level factors on domestic political organization. While much of the recent work discussed above emphasizes how firm- and industry-level characteristics affect firm preferences and political behavior, this study focuses on how an international-level factor – the structure of international trade – interacts with firm and industry characteristics to influence political organization. In this way, the paper speaks to the canonical IPE literature on trade coalitions by showing how contemporary trade patterns that are more heavily intra-industry change the coalitional structures predicted by classic models that assume trade is primarily inter-industry and based on comparative advantage.

4. INTRA-INDUSTRY TRADE, PREFERENCES AND POLITICAL COALITIONS

Why are industry associations sometimes highly active in trade politics, while at other times associational lobbying takes a backseat to lobbying by individual firms? In the USA, for example, lobbying in the furniture manufacturing industry primarily takes place via industry associations. On the other hand, lobbying in the automobile industry is overwhelmingly undertaken by individual firms. To explain this, I consider the effect of IIT on firm and industry preferences about trade policy. I theorize that IIT undermines industry-wide consensus and makes collective action difficult. I assume that industry associations prefer trade policies that

maximize the profits of their member firms, and firm owners prefer policies that maximize their firm's profits. I assume elected officials are primarily interested in securing re-election and that they compete to attract campaign contributions and provide societal groups with the policies they demand in exchange for financial and electoral support. Like elected legislators, bureaucratic agents are susceptible to special interest lobbying.¹¹ Bureaucrats need information, and they depend on private special interest groups to provide them with this information. I also assume that trade liberalization is reciprocal, products are differentiated and trading countries are reasonably balanced in terms of competitiveness.

These assumptions allow me to generate some specific expectations about the way IIT affects trade preferences. First, IIT generates competing preferences among firms within the same industry, undermining industry consensus over the optimal level of protection. When trade policy is made in the context of bilateral or multilateral free trade agreements, exporting firms will support tariff reductions as a means of increasing their access to foreign markets (Osgood 2016a, 2016b; Betz 2015; Plouffe 2016; Gilligan 1997b). For most exporters, the increased import competition they face post-liberalization will be outweighed by the benefits they can achieve with lower trade costs in export markets. Thus, reciprocity-based trade policy-making is a key scope condition. Osgood (2016a) argues that reciprocal trade liberalization is a necessary condition of intra-industry division over trade policy.¹² If trade liberalization were undertaken unilaterally, exporting firms would not benefit from increased access to foreign markets and would have no reason to support liberalization. An exception to this may be exporting firms that also import. As importers, these firms could benefit from lower cost access to imports even if liberalization is not reciprocal. Exporting firms are also likely to oppose unilaterally proposed measures of protection, such as antidumping safeguards, for fear of foreign retaliation. Jensen et al. (2015b) find that this is true of firms engaged in foreign direct investment.¹³

On the other hand, smaller, less productive firms that do not export will be negatively affected by import competition. A reduction in trade barriers will increase competition for domestic market share, possibly resulting in revenue losses. The threat of import competition to small- and medium-sized firms is not only due to the greater number of product varieties available to consumers. These imports are likely to be highly competitive and lower priced, as only large, productive firms are able to enter foreign markets (Bernard et al. 2007). Domestic-oriented firms might prefer trade openness if they source inputs from abroad, but these firms are not likely to import, as importing involves considerable entry costs. Like exporting, it is a rare firm behavior and typically only the biggest, most productive firms import intermediate goods (Kasahara and Lapham 2013). Thus, non-exporting, non-importing firms are likely to

Table 1 IIT and the structure of trade coalitions

Level of IIT	Class coalitions	Industry coalitions
Low	Unified when factor mobility is high (Stolper–Samuelson effect)	Unified when factor mobility is low (Ricardo–Viner effect)
High	Divided	Divided

prefer protection from foreign competitors. Even in industries with high product differentiation, where goods are not perfectly substitutable, domestic-oriented firms can benefit from trade barriers protecting them from foreign varieties. There will be no foreign producer selling exactly the same product as any domestic producer, so protection against foreign varieties will benefit all domestic producers producing similar varieties. As exporting is a rare activity even in export sectors, there will be a significant number of these small- and medium-sized firms with preferences for protection. This heterogeneity in firm preferences undermines industry consensus over trade and makes it more difficult for industry-wide trade associations to secure broad support from firms.

These predictions differ from those of the classic trade models, which depend on factor mobility. Factor mobility may affect the structure of coalitions – class-based vs. industry-based – in a world of *inter*-industry, endowment-based trade, but factor mobility loses its relevance in a world of IIT between countries with similar endowments (Alt et al. 1999). The present model, which is based on new trade theory and considers the political implications of intra-industry trade, represents an alternative to the Ricardo–Viner and Stolper–Samuelson models. When trade is primarily intra-industry in nature, the predictions of the present model apply. Table 1 presents the likely coalitional outcomes at different levels of IIT.

5. INTRA-INDUSTRY TRADE AND A NEW LOGIC OF LOBBYING

After preferences are determined, actors have to decide (1) whether and how much to lobby, and (2) whether to lobby through an industry association or alone. I focus on lobbying rather than other types of political action, such as campaign contributions. In doing so, I follow other analysts who argue that lobbying is the most theoretically appropriate form of political activity to analyze in studies of trade politics, as it is the most instrumental and communicates the most information about policy preferences (Hansen and Mitchell 2000).¹⁴ At the same time, lobbying is costly, and actors undertake costly political action aimed at influencing

Table 2 IIT and firm lobbying behavior

	Exporting firms	Import-competing firms
Low IIT	Little to no lobbying	Active protectionist lobbying in comparative disadvantage industries; little to no lobbying in comparative advantage industries
High IIT	Active free trade lobbying	Active protectionist lobbying

trade policy only when they expect the benefits of action to outweigh the costs. The institutional costs of lobbying vary across national contexts, and I do not build an institutional theory here.¹⁵ However, I build the collective action costs of political activity into my model. I assume that collective action is possible when members of a group share interests and preferences, but that the ease with which it occurs varies according to a host of factors. One important factor is the size of the group: as argued by Olson (1965), small groups are better able to overcome collective action problems because policy effects are more concentrated on small groups, creating a bigger incentive for action, and small groups can better manage the free-rider problem.

First, I expect lobbying by associations and other industry-based groups to be lower in industries with higher IIT, relative to lobbying by individual firms. Because of competing trade preferences among firms in the same industry, collective action is more difficult. Firms may revoke membership or contributions if trade associations take an active lobbying stance for a trade position that is counter to their interests. To avoid losing members, associations may take weaker stances on policy. They may also stop lobbying for particular trade positions altogether, or they may decrease the amount of resources they spend on lobbying over trade legislation.

Second, as industry associations become less active in trade policy-making due to competing trade preferences among their members, individual firms will become increasingly politically active, lobbying alone for their preferred policies. Why don't free-trading firms form new, smaller liberal coalitions, while import-competing firms form new, smaller protectionist coalitions? This is a possibility, but it is costly to form new organizations for collective action, even among small groups. Olson (1982) emphasized the 'special start-up costs' involved in creating a new organization or 'pattern of cooperation'. At least in the short term, firms may calculate that the costs of building a new political coalition, even among a smaller group of firms, outweigh the costs of lobbying alone for protection of their particular product variety. Thus, I expect that as IIT increases, individual firm lobbying will increase relative to association-based lobbying.

In a departure from some existing studies discussed above, I argue that this is true for both import-competing and exporting firms. The logic is as follows. First, import-competing firms in industries with high IIT have more incentive to lobby for protection than firms in other industries, because the costs of trade liberalization are even more concentrated in IIT industries. As economists have demonstrated, trade costs in IIT industries fall on individual firms rather than being spread across entire industries. If industry associations scale back their lobbying activity because of conflicting preferences held by their member firms, import-competing firms have a strong incentive to represent themselves politically.

This logic also holds for exporting firms: the benefits of liberalization are concentrated on them rather than shared with the entire industry, and exporters typically represent a small fraction of all the firms in an industry. When firms enjoy concentrated benefits, they are less likely to free ride off other firms' contributions. They have a greater incentive to lobby to ensure an optimal level of protection for themselves, be it high or low. Additionally, because import-competing firms in industries with high IIT have an incentive to lobby for protection, exporting firms within the industry have an added incentive to lobby in order to counteract the protectionist pressures coming from within their very industry. One implication of this is that the effect of IIT on firm-level lobbying should be the strongest in net-importing industries that face heavy import competition. In these industries, industry associations are likely to lobby for protection. Exporting firms in these sectors will have an interest in breaking from the industry position and lobbying individually for liberalization.¹⁶

6. DATA AND MEASURES

To test my expectations about the relationship between IIT and forms of political organization, I use a data sample consisting of all 459 US manufacturing industries, minus missing data.¹⁷ The industries are part of the 2000 and 3000 groups of manufacturing sectors and encompass the entire range of manufactured products, from food products to chemicals to apparel to machinery. I created this data-set by merging firm and industry data on trade policy lobbying expenditures collected by Bombardini and Trebbi (2009) with trade data and other firm and industry data that comprise my independent variables. Bombardini and Trebbi's data-set documents lobbying expenditures by firms and associations from a wide range of US industries that lobbied over trade policy (and often, other policy issues). This data is sourced from the Center of Responsive Politics and the US Senate Office of Public Records and it consists of lobbying spending targeted at Congress and US government agencies. Data from 1999 to 2001 was pooled to maximize coverage. Each observation is coded to indicate whether the lobbying client was an

individual firm or a trade association and matched to a four-digit level industry. Data is also aggregated to obtain an industry-level measure.¹⁸

In the remainder of this section, I describe the lobbying variables, IIT measure and other independent variables, as well as data sources.

6.1. Dependent variable

The dependent variable in this analysis, *Firm Lobby Proportion*, is measured as the proportion of an industry's lobbying expenditures that are made by individual firms relative to expenditures by industry associations. This measure was obtained from Bombardini and Trebbi (2009). *Firm Lobbying Proportion* is a bounded continuous variable ranging from 0 to 1. A score of 0 indicates that all lobbying expenditures in an industry were undertaken by associations, while a score of 1 indicates that all lobbying expenditures in an industry were undertaken by individual firms. It is important to note that this data-set does not tell us what is being lobbied. This data gives us a picture of how industries are politically organized to influence trade policy. A higher score on the dependent variable indicates greater individual firm lobbying relative to industry associational activity.

The distribution of this dependent variable is strongly bimodal. As shown in Figure 2, it is common for individual firms to contribute nearly all of an industry's lobbying expenditures, and it is also common for individual firms to contribute nearly none of the lobbying expenditures. In nearly 53% of industries, individual firms contribute 90% or more of the industry's total lobbying expenditures, while in 20% of industries individual firms contribute less than 10% of total lobbying expenditures. In my sample, the mean proportion of industry lobbying undertaken by individual firms is 0.667. During the period between 1998 and 2008, all the years for which data was available, 84% of manufacturing sectors engaged in some level of lobbying over the trade policy issue (Bombardini and Trebbi 2012).

6.2. Independent variable

The main independent variable in this study is *IIT*. I employ the most commonly used measure of IIT, developed by Grubel and Lloyd (1975):

$$IIT_i = 1 - \frac{|X_i - M_i|}{(X_i + M_i)}$$

where X_i and M_i are measures of exports and imports of industry i , respectively. This measure approaches one as trade becomes more balanced, or more heavily IIT, and it reaches zero when there is no two-way

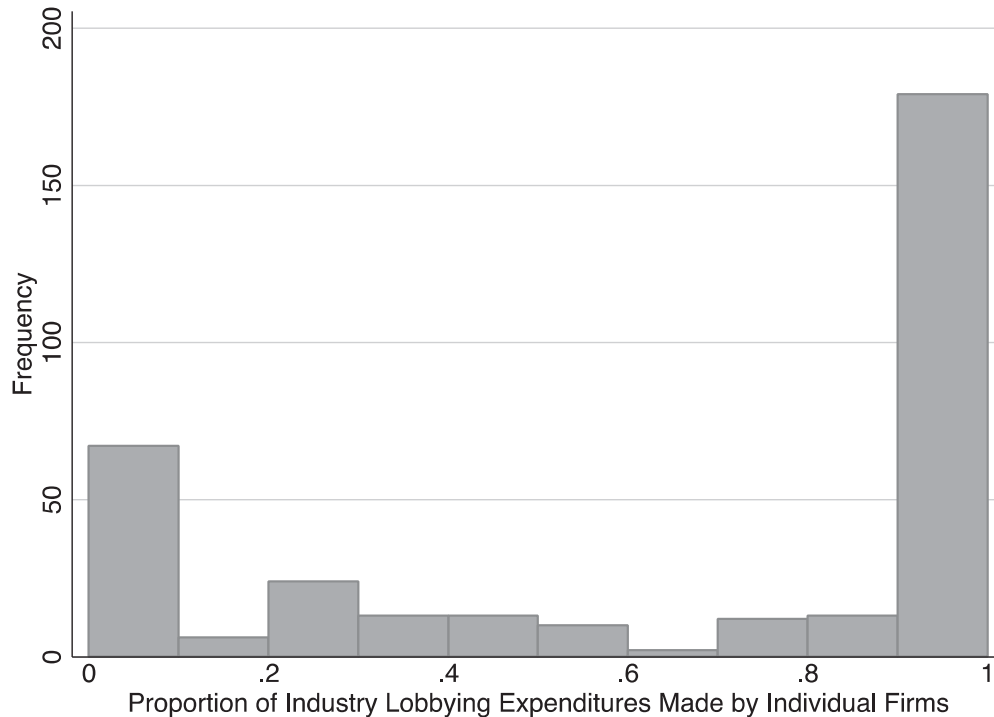


Figure 2 Trade lobbying by individual firms versus coalitions in US manufacturing sectors (1999–2001).

Source: Bombardini and Trebbi (2012). Data is for 339 US manufacturing sectors, defined at the four-digit SIC level. Data is pooled over 1999–2001 to maximize coverage.

trade in the given industry. A low score on the IIT measure indicates that a sector is either a strong exporting sector with few imports, or a heavily import-competing sector with few exports. I constructed this measure using sector-level import and export data from the year 1999 from Schott (2010).

6.3. Industry characteristics

I include several control variables to test for leading alternative explanations for variation in the structure of political organization. I include a measure of industry concentration to test the argument that lobbying through trade associations will occur in more concentrated industries with fewer collection action problems to overcome. On the other hand, in concentrated industries the leading firms are likely influential enough to lobby alone, and associational lobbying may occur less frequently. *Industry Concentration* is from Bombardini and Trebbi (2009) and is measured as the four-firm concentration ratio: the percentage of industrial shipments that are produced by the top four firms in an industry. I control for

the level of *Product Differentiation* using Broda and Weinstein's (2006) measure of elasticity of substitutability. Recently, scholars have shown that high industry-level product differentiation is associated with divided firm preferences (Osgood 2016b) and greater firm-level lobbying (Bombardini and Trebbi 2012; Kim 2013). Though industries with high product differentiation are also likely to experience high IIT, these two variables are uncorrelated in this sample ($\text{corr} = 0.015$).

The variable *Average Size* measures the average firm size in each four-digit industry. This variable controls for the fact that large firms are more likely to lobby alone than small firms. Thus, in industries with a large average firm size, individual firm lobbying activity may be higher relative to associational activity. This variable is measured in millions of dollars and is calculated by dividing the industry's total shipments by the number of firms. Data is from the 1997 US Economic Census. The variable *Industry Size* evaluates the argument that larger industries with more resources may have more active industry associations. I measure industry size using shipments data from the National Bureau of Economic Research Manufacturing Industry Productivity Database. I also control for existing levels of tariff protection. In industries that already have low tariff levels, overall lobbying levels may be low. The variable *Tariff* is constructed using trade-weighted industry-level tariff levels in the year 1999. This data is from Feenstra et al. (2002). Finally, I include a separate intercept at the SIC-1 sector level to control for unmeasured factors that may differ across the two sectors examined in this data.

Controlling for these industry characteristics, we strengthen our confidence in the argument that the structure of international trade (intra- vs. inter-industry) affects the way that industries and firms lobby over trade policy. I report descriptive statistics for all variables in [Appendix 1](#).

7. EMPIRICAL ANALYSIS AND RESULTS

To test my argument that IIT leads to more active lobbying by individual firms relative to industry associations, I estimate the following model using Tobit regression:

$$\text{Firm Lobby Proportion}_i = \alpha + \beta \text{IIT}_i + \beta X_i + e_i$$

where Firm Lobby Proportion is the proportion of an industry's lobbying expenditures undertaken by individual firms, *IIT* is an industry's level of intra-industry trade and *X* includes the control variables described above. I estimate this model using Tobit because the dependent variable is measured as a proportion of one with non-normal distribution and censoring occurring toward both zero and one (see [Figure 2](#)). Therefore, I

Table 3 IIT and industry lobbying
DV: proportion of industry lobbying by individual firms

	Model 1	Model 2	Model 3
Intra-industry trade	.349** (.149)	.346** (.152)	.309** (.151)
Industry concentration		.007*** (.002)	
Average firm size (logged)			.089** (.038)
Product differentiation (logged)		-.079 (.055)	-.092* (.055)
Industry size (logged)		.061** (.029)	.022 (.035)
Tariffs (logged)		-.015 (.022)	-.019 (.022)
Sector dummy		-.273*** (.074)	-.250*** (.077)
Constant		.034 (.244)	.997** (.414)
Observations	293	274	274
Left-censored	1	1	1
Right-censored	126	113	113

Note: * $p < 0.1$, ** $p < 0.05$; *** $p < 0.01$. All standard errors (in parentheses) are heteroskedasticity robust.

treat the proportion as a continuous variable censored at 0 and 1, employing a two-limit Tobit model.¹⁹

Tobit results are reported in Table 3 and regression results of the fully specified model are displayed graphically in Figure 3. In the bivariate model (Model 1), IIT is positively and significantly related to more active lobbying over trade policy by individual firms, relative to trade associations. We can see that as IIT increases, collective political activity at the industry level becomes less likely, while political activity by individual firms becomes more likely. Firms in industries with high levels of IIT contribute a substantial proportion of the industry's lobbying expenditures, relative to associations. In industries with low levels of IIT, individual firms are less likely to lobby while industry associations are more likely to lobby.

This result holds even when controlling for other factors that are expected to influence a firm's decision to mobilize politically. Some of these other factors have a statistically significant effect on political organization as well. First, in the full multivariate model presented in Table 3

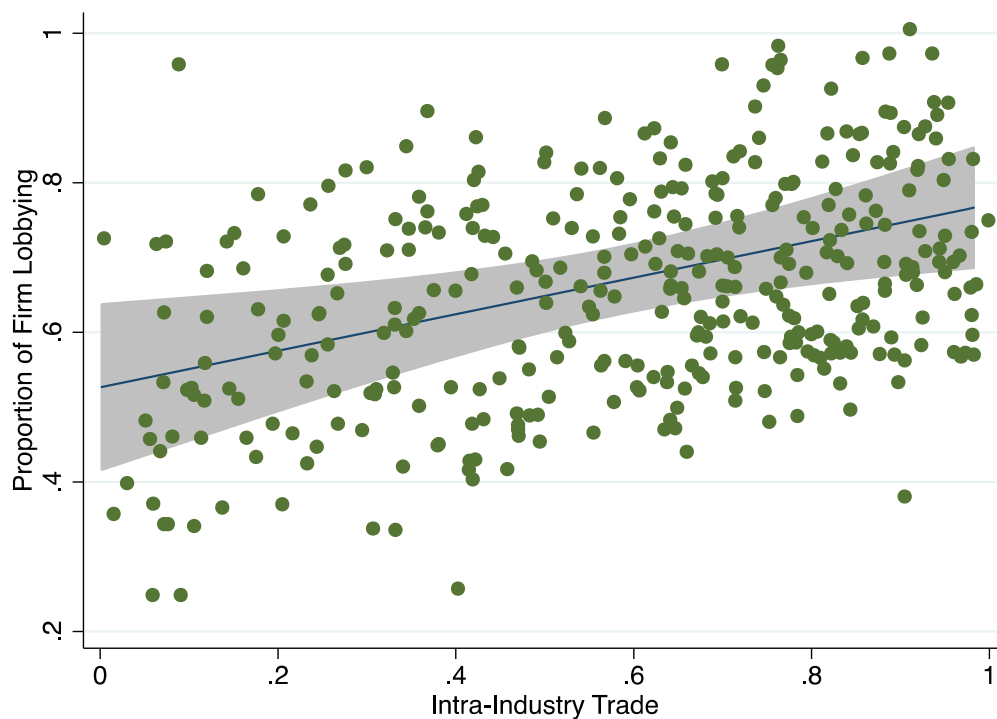


Figure 3 Predicted values of firm lobbying relative to coalition lobbying.

(Model 2), we see that the coefficient for industry concentration is also positive and significantly related to firm-based lobbying. When an industry's production is more concentrated into the hands of the four leading firms within the industry, these firms are more likely to lobby alone than firms in less concentrated sectors. As concentration decreases and an industry's production is more dispersed among many firms, these firms are more likely to engage politically via an industry-based association. This finding seems to challenge the Olsonian expectation that industries with fewer firms, or fewer big firms, have an easier time organizing to jointly influence policy. However, Olson's logic rests on an assumption of shared preferences. In an industry with heterogeneous trade preferences, trade associations are reluctant to take a strong lobbying stance. Firms that want to influence policy are faced with two options: (1) lobby alone, or (2) form a new, smaller coalition with like-minded firms. Olson also argues that new collective action organizations are extremely costly to create. Thus big, influential firms at the forefront of highly concentrated industries may calculate that resources are best spent lobbying directly than building coalitions.

Second, perhaps counter-intuitively, industry size is also positively and significantly associated with firm-based lobbying. In larger industries, firms are more likely to lobby alone over trade policy, relative to

associations. In small industries, associations contribute more to lobbying efforts than individual firms do. The coefficient for product differentiation is negative, in line with the findings of recent studies cited earlier. It just fails to achieve significance in this model, though it is significant in other models discussed below. Finally, the control for existing level of protection is not significant.

Many empirical studies have shown that large firms are more likely to lobby alone than small firms, so I also include a control to be sure that firm size is not driving my results. The measure of average firm size is fairly strongly correlated with industry concentration ($\text{corr} = 0.64$), and diagnostics indicate a possible multicollinearity problem. When average firm size is included along with industry concentration in the model above, IIT and industry concentration retain their significance but all other variables lose significance. Separating these two variables appears to yield better-specified models. I include average firm size as a covariate in place of industry concentration in Model 3.

As expected, firm size does have a positive and significant effect on firm-level lobbying. In industries with a larger average firm size, individual firms are more politically active relative to industry associations. Industries with smaller firms on average rely more heavily on industry associations for lobbying. Importantly, however, IIT retains a strong and independent effect on political organization. Even among industries with a large average firm size, the level of IIT affects the decisions firms make about whether to lobby jointly or individually over trade policy. The effect of industry size in this model loses its significance, possibly because of moderate levels of correlation between the industry size and average firm size independent variables. Product differentiation is negative and significant, in line with the findings of other recent work showing that greater product differentiation leads to intra-industry division over preferred trade policies.

To check the robustness of the results of the primary model in [Table 3](#), I tested for the effect of outliers, and results hold when high-leverage observations are removed. Second, I repeated the analysis using probit and logit estimation techniques.²⁰ Results are similar using both these estimators, increasing confidence in my core finding that IIT exerts a positive and significant effect on the structure of political organization. Third, I included Busch and Reinhardt's (1999) measures of political and geographic concentration, to control for other determinants of industry-level lobbying strength. The results are similar and are presented in [Appendix 2](#).

Some scholars have argued that IIT is an artifact of product differentiation and that its effects on intra-industry division and political activity can be captured using product differentiation as the key explanatory variable. There is certainly strong evidence from recent work discussed above that product differentiation affects the political organization of

firms and industries. Yet while product differentiation may be a necessary condition for IIT, it is not a sufficient condition. Two-way trade is also a result of factors such as low transport costs, foreign direct investment flows, trade in intermediate goods and the similarity of trading partners in terms of endowments and competitiveness. Trade in differentiated products is not likely to occur between countries with greatly different endowments or greatly different market sizes. Thus product differentiation and IIT are different phenomena, though related, with one being a feature of industries and the other being feature of the nature of international trade. Some industries with high product differentiation may not experience significant levels of two-way trade, and in this sample, product differentiation is not correlated with IIT.

To increase confidence in the independent effect of IIT on political organization, I performed a number of robustness checks. First, I replicated Bombardini and Trebbi's (2012) analysis, and I added IIT to their model to see how it altered their results (Appendix 3). Their key variable, product differentiation, remains significant in the model including IIT, and IIT is also significant. Second, I estimated the marginal effects of changes in IIT when product differentiation is held at its minimum and all other predictors are held at their means (Appendix 4). Even when product differentiation is very low, a one-unit increase in IIT results in a 61% increase in firm-level lobbying, relative to associational lobbying. Finally, I repeated my analysis using Bombardini and Trebbi's discretized elasticity measures (capturing low, medium and high levels of product differentiation), and my results hold (Appendix 5). Product differentiation also attains significance in two of these three models. While product differentiation is one factor that affects how industries and firms lobby over trade, the results presented here demonstrate that IIT has an independent effect on lobbying regardless of level of product differentiation. At all levels of product differentiation, two-way trade erodes industry consensus and incentivizes lobbying by individual firms for their preferred trade policies.

7.1. Import competition, export dependence and internationalized firms

The analyses above examine the role of IIT in relation to a number of industry characteristics that recent studies have shown to affect the way that firms and industries lobby over trade. In this set of models, I introduce several trade-related variables to control for the effects of firm internationalization, import competition and export dependence.

First, much firm-level lobbying may be simply about easing access for imported intermediate goods. If firms have an interest in reduced tariffs

on intermediate inputs, this lobbying would likely happen on a firm-by-firm basis based on firm-specific importing needs, rather than through an industry association. I control for this using a measure of industry use of imported intermediates in 1999 obtained from Schott (2004), divided by total trade to obtain the portion of industry trade that consists of trade in parts. Second, firm-based lobbying may be driven not by IIT but by intra-firm trade. A substantial percentage of international trade consists of trade in both intermediate and finished products among foreign affiliates of the same parent firm. As Milner (1988) argued, these multinational enterprises are likely to have a greater interest in trade liberalization than domestically oriented firms in their industry. Thus, we may observe more lobbying by individual firms in industries with higher levels of foreign direct investment, as industry consensus around protection is undermined. To control for this explanation I use data from 2002 on related-party imports and exports from the US Census Bureau Related-Party Trade Database. I create an index of total related-party trade for each industry by summing the imports and exports measures, and then divide it by total trade to measure the portion of each industry's trade that consists of intra-firm trade.²¹

I present the results in Table 4. The imported intermediates and related-party trade measures are used in separate models because of conceptual overlap, though results are similar when both are included in the same model. We see that the effect of IIT remains significant and positive even when controlling for both of these measures of firm internationalization. Neither measure is significant in these models, nor in bivariate models, which I do not report here.

Third, I introduce a control for the effect of import competition on the structure of lobbying coalitions. This is important because in import-competing sectors, firms tend to be united by protectionist preferences and they are more likely to lobby via industry associations. Because of multicollinearity problems between IIT and measures of import competition, I control for import competition by restricting the sample to import-competing sectors. I define a sector as import-competing if its share of import penetration is greater than the sample mean (0.2). I measure import competition as the proportion of imports relative to production for the domestic market (imports/shipments + imports/exports), and I construct this measure using Schott's (2010) imports, exports and shipments data for the year 1999.

Finally, I repeat the analysis on sectors that are more export dependent. We may observe active industry association lobbying relative to firm-based lobbying in competitive export sectors where firms are united in support of trade liberalization. On the other hand, the effect could run the other way, with active lobbying by individual exporters and less activity by industry associations. This is the expectation of the

Table 4 IIT and industry lobbying
DV: proportion of industry lobbying by individual firms

Intra-industry trade	.364** (.154)	.273* (.163)
Industry concentration	.007*** (.002)	.007*** (.002)
Product differentiation (logged)	-.080 (.054)	(-.087) .056
Industry size (logged)	.058** (.029)	.058* (.034)
Tariffs (logged)	-.015 (.022)	-.009 (.022)
Imported intermediates	-.267 (.373)	
Related-party trade		-.278 (.289)
Sector dummy	-.254*** (.080)	-.265*** (.083)
Constant	.050 (.244)	.206 (.286)
Observations	274	253
Left-censored	1	1
Right-censored	113	106

Note: * $p < 0.1$, ** $p < 0.05$; *** $p < 0.01$. All standard errors (in parentheses) are heteroskedasticity robust.

'empowering exporters' literature.²² I create a measure for export dependence (exports/exports + shipments) using Schott's (2010) data on exports and total industry shipments, and I define export-dependent sectors as those whose export dependence is above the sample mean (0.135). The results of these two analyses are presented in Table 5.

We see that IIT remains significant and positive in Column 1, when the sample is restricted to import-competing sectors. This is strong support for the theory presented in this paper, which argues that IIT creates incentives for firms to lobby alone not only for protection, but also for trade liberalization. In net-importing sectors, an increase in IIT represents an increase in exports. Thus, we likely see more firm-level lobbying in net-importing sectors with higher IIT because exporting firms are breaking away from protectionist industry associations to lobby for reciprocal trade liberalization.

However, IIT loses its significance in Column 2, when the sample is restricted to export-dependent sectors. In strong exporting industries, an

Table 5 IIT and industry lobbying
DV: proportion of industry lobbying by individual firms

	Import-competing industries	Export-dependent industries
Intra-industry trade	.492** (.225)	.317 (.260)
Industry concentration	-.001 (.004)	.006* (.003)
Product differentiation (logged)	-.118 (.075)	-.094 (.073)
Industry size (logged)	.038 (.040)	.046 (.044)
Tariffs (logged)	-.021 (.024)	-.016 (.029)
Sector dummy	.180 (.110)	-.091 (.114)
Constant	.093 (.266)	.126 (.326)
Observations	105	126
Left-censored	1	3
Right-censored	33	49

Note: * $p < 0.1$, ** $p < 0.05$. All standard errors (in parentheses) are heteroskedasticity robust.

increase in IIT represents an increase in import competition. This may generate a protectionist response only from small, non-exporting firms that do not rely on reciprocal access to foreign markets. If these firms find it difficult to mobilize the resources to lobby for protection or sway the position of their industry groups, we may not observe changes in patterns of political organization. The results of these models show that import competition is not driving the results I find in the full model, but the results also suggest that IIT may not have a uniformly positive effect on firm-level lobbying in all industries. If the effect of IIT on lobbying is to erode industry consensus and generate greater lobbying efforts by individual firms, the effect may be weakest when large exporting firms and industry associations are aligned in their trade preferences. Small, domestic-oriented firms are the least equipped to lobby effectively against powerful exporters and industry associations. Thus, the effects of IIT on lobbying may be weakest in exporting industries. These findings suggest interesting avenues for future research on lobbying dynamics in comparative advantage versus comparative disadvantage industries.

8. DISCUSSION AND CONCLUSION

The results of my analyses provide support for my arguments about the relationship between IIT and the structure of domestic political coalitions organized to influence trade policy in the United States. In brief, I showed that the adjustment costs of trade liberalization in industries that export as well as compete with imports fall on individual firms, rather than entire classes or industries. I argued that this leads to a breakdown in industry consensus over trade policy, limiting the extent to which industry associations can lobby for a particular trade position. This claim is supported in my analyses: controlling for a host of factors, I consistently found that industry-based associations are less active relative to individual firms in industries with higher IIT. This effect is stronger in import-competing sectors than in strong exporting sectors. This suggests that in import-competing sectors, exporting firms break away from protectionist industry associations to lobby alone for liberalization. As IIT has grown over the past few decades to account for an increasingly large share of total US trade, this may be one way to understand the rise of corporate lobbying in US trade politics.

While several recent studies have emphasized the influence of industry and firm-level characteristics on the structure of political organization, my study demonstrates the continued importance of international factors. My results confirm that firm and industry characteristics such as industry concentration, industry size, firm size and product differentiation affect the way that firms and industries organize themselves politically, but I also show that political organization is affected by the nature of an industry's trade exposure. When trade creates opportunities for exporters at the same time that it results in greater import competition, industry-wide consensus is undermined, and this fracturing of trade policy preferences makes industry-level lobbying more difficult, no matter the size of the industry, the size of the average firm in the industry, or the extent of product differentiation. However, the effect of IIT on lobbying in this study was strongest in industries facing heavy import competition, and it was weakest in more export-dependent sectors. This suggests that large, exporting firms may lobby for freer trade as a counterweight to more protectionist industry associations.

This study also suggests an explanation for the fact that certain trade agreements are more controversial than others. IIT is primarily a feature of trade between countries that are similar in competitiveness. My argument about the effect of IIT on trade politics is most likely to hold when developed countries are negotiating trade agreements with other developed countries. A logical next step for future research would be to compare firm and industry lobbying patterns over an agreement like the Transatlantic Trade and Investment Partnership (TTIP) between the USA

and the EU, whose trade is heavily intra-industry, and the Trans-Pacific Partnership (TPP) between the USA and 11 Pacific Rim countries that differ greatly in terms of competitiveness, factor endowments and labor costs. Trade among the TPP countries is much more heavily inter-industry, and we would expect to observe more active lobbying by industry associations and organized labor than we observe in negotiations over the TTIP.

To conclude, our canonical studies of trade politics make predictions about societal cleavages and coalitions based on the assumption that trade is based on comparative advantage. These studies remain well suited to explaining trade politics when trade is primarily inter-industry. My findings complement and extend endowment-based models of trade politics. In this study, I found that when IIT is low, industry associations are more active in lobbying, relative to firms. This is what the classic theories predict. But these classic approaches cannot explain the breakdown in industry-based lobbying coalitions that has characterized contemporary trade politics in the USA and in other developed economies. In showing how trade can divide firms within the same industry, this study suggests policy-makers need to consider not only industry-level effects of changes in trade policy, but also the differential effects that liberalization and protection have on individual firms and their workers.

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DISCLOSURE STATEMENT

No potential conflict of interest was reported by the authors.

NOTES

1. This is an empirical departure from the predictions of the classic trade theories, which expect trade to be endowment-based and inter-industry: countries with a comparative advantage in producing capital-intensive goods, for example, would specialize in and export these products while importing land- and labor-intensive goods. Much of the world continues to trade primarily along inter-industry lines, and the developed economies are exceptional for the high percentage of intra-industry trade in their trading profiles (Brühlhart 2009).

2. In terms of the standard trade theories discussed above, the two crucial distinctions between intra-industry and inter-industry trade are that (1) intra-industry trade occurs between countries with similar rather than different factor endowments, and (2) as a result, countries trade in different varieties of similar products.
3. Analyses indicate that this number has increased over time. Estimates of intra-industry trade's share of total global trade vary depending on how it is defined and measured, but 25%–50% is an accepted range (Brülhart 2009, OECD 2002, Ruffin 1999).
4. Data from the Senate Office of Public Records. Registrants filed a total of 3929 reports mentioning trade (among other issues), each disclosing lobbying expenditures of more than \$10,000. These figures underestimate total lobbying, as expenditures under the \$10,000 threshold are not legally required to be reported. In 2013, there was an additional \$85 million spent lobbying over miscellaneous tariff bills.
5. Figure 1 shows a modest decline in IIT for US manufacturing sectors since the mid-1990s. This is consistent with trends in other high-income countries, as demonstrated by Brülhart (2009), which show that the growth in IIT has slowed or flattened out in many developed economies, even as it continues to grow in importance in many middle-income countries. The slowdown in the advanced economies may reflect the declining importance of certain sectors such as automobiles and electronics in the trade portfolios of high-income countries, as well as the offshoring of manufacturing to emerging market economies (Francis and Morel 2015).
6. For example, Alt et al. (1999), Brawley (1997), Garst (1998, 1999), Jeong (2009), Ladewig (2006) and Midford (1993).
7. When factor mobility is high, Stolper–Samuelson effects take hold and trade politics are waged along class lines (workers vs. factory owners, for example). When factor mobility is low, Ricardo–Viner effects dominate and trade politics pitches industries against each other (protectionist owners and their workers vs. free-trading owners and their workers). Some studies make inferences about Stolper–Samuelson or Ricardo–Viner effects through analysis of individual-level trade preferences (Ahlquist et al., 2014, Beaulieu 2002, O'Rourke 2003, Scheve and Slaughter 2001).
8. A working paper by Jensen et al. (2015a) shows that firm heterogeneity in engagement with the global economy affects not only the lobbying behavior of firms, but how firm employees vote in presidential elections. Using county-level data, they show that voters in US counties with high levels of employment in competitive tradable sectors tend to vote for incumbents as a reward for strong economic performance. In counties characterized by employment in low-wage sectors negatively affected by import competition, voters at these 'losing' firms were more likely to vote against incumbents.
9. An implicit assumption made by all the studies cited above is that lobbying will affect trade policy outcomes. Grossman and Helpman's (1994) 'protection for sale' framework provided an explicit theoretical basis for this assumption, modeling policy-makers as interest-maximizers seeking contributions from industry lobbyists to fund their election campaigns. In exchange, policy-makers provide industries with trade protection. This contribution was supported empirically by several subsequent studies (Gawande and Bandyopadhyay 2000; Goldberg and Maggi 1999), though its own assumption that lobbies seek protection conflicts with more recent

- findings from the firm heterogeneity literature indicating that certain firms prefer, and lobby for, liberalization.
10. Evidence suggests that the mode of lobbying affects trade policy outcomes. Sectors that lobby through industry-level associations are more likely to receive tariffs and other forms of protection than sectors with primarily firm-based lobbying (Bombardini and Trebbi 2009).
 11. There is evidence from the American context that both legislators and bureaucrats are susceptible to lobbying. For just a few examples from this literature, see Drope and Hansen (2004), Hankla (2006), Hansen and Prusa (1996), McGillivray (1997) and Shepsle and Weingast (1984).
 12. Osgood further refines the conditions for intra-industry division over trade policy, arguing that division is most severe when the countries party to trade liberalization are relatively equal in size and competitiveness.
 13. However, some non-tariff measures of protection (NTMs), such as export subsidies or tax refunds for exporters, are less easily detectable by foreign competitors, and firms may continue to pursue these forms of protection. Given the competing interests of firms (and workers) in IIT industries, we might also expect that policy-makers will compensate the losers of openness with protection of the non-tariff variety. NTMs can be applied to support both specific producers as well as an entire industry, so rent-seeking policy-makers may find a way to offset the costs of tariff reductions with non-tariff protections for smaller firms and their workers. In IIT industries, firms and associations seeking protection may anticipate more success in lobbying for NTMs than for tariffs. A fruitful avenue for future research would be to investigate whether NTMs are more significant in high-IIT industries than in industries where IIT is lower and firms are more unified in their preferred levels of protection.
 14. In the literature on lobbying in the USA, lobbying activities, such as meeting with policy-makers, testifying at Congressional hearings and drafting legislation are considered theoretically distinct from campaign contributions. Richter et al. (2009) elaborates this distinction and finds evidence that firms do reap gains from lobbying activities. Ansolabehere et al. (2003) find that the evidence is 'thin' that campaign contributions influence legislator voting behavior. From an analytical standpoint, lobbying expenditures are preferable to 'soft money' campaign contributions as an indicator of political involvement in trade policy-making because lobbying expenditures are targeted to a particular policy area, while it is not possible to know whether campaign contributions were aimed at influencing trade policy or other issue areas.
 15. I explicitly black-box institutions in this analysis to develop a demand-side theory of the way that economic factors – intra-industry trade and firm heterogeneity – affect political organization.
 16. I appreciate the comment by an anonymous reviewer pointing out that this discussion assumes a world of low factor mobility. While factor mobility is irrelevant when IIT is high (Alt et al. 1996), my expectations that lobbying will be industry-based when IIT is low implicitly assume that Ricardo–Viner effects hold. Of course, if factor mobility were high, Stolper–Samuelson effects would dominate and we would observe lobbying coalitions to be broadly class-based or factor-based. I have not fully developed the Stolper–Samuelson predictions for brevity's sake, and I have focused the discussion on industry-based lobbying because conventional wisdom holds that factor mobility is low in advanced industrial economies (Hiscox 2001, 2002a),

though some find evidence to the contrary (Ladewig (2006) discusses the difficulties in measuring factor mobility; he finds evidence that it has recently been high in the USA).

17. In this study, industries are defined at the four-digit sector classification level according to the Standard Industrial Classification (SIC), revision 2. Non-manufacturing industries are excluded simply because of problems with data availability on the independent variables.
18. Before the passage of the Lobbying Disclosure Act in 1995, studies of trade politics often used campaign contribution data to measure political activities, which is problematic because it is not possible to know whether contributions were made in order to influence trade policy or other issues entirely. Bombardini and Trebbi (2012) note that lobbying disclosure data remains rarely exploited in the trade politics literature.
19. Long (1997) and others argue that dependent variables measured as a proportion or a percentage out of 100 can be treated as a censored variable. Tobit models are used to analyze dependent variables that cannot take values above or below certain limits (Roncek 1992).
20. To estimate probit and logit models, I converted the dependent variable to a dichotomous variable with values of 0 if firm lobby proportion is less than or equal to 0.2 and 1 if it is greater than or equal to 0.8. The number of observations drops to 208.
21. The Census Bureau data is coded according to the NAICS 2002 industry classification system. I manually matched the NAICS data to the SIC87 data employed in this paper using the concordance provided by US Census and available at <https://www.census.gov/eos/www/naics/concordances/concordances.html>.
22. It is worth noting that this discussion is framed in terms of Ricardo–Viner effects and united industries because the data used in this analysis include information on lobbying by industry associations and firms, rather than labor organizations or other factoral coalitions. However, similar dynamics hold in a Stolper–Samuelson world of united factors. In comparative disadvantage industries, scarce factors would be unified in favor of protection, while in comparative advantage sectors abundant factors would be unified in favor of liberalization.

NOTES ON CONTRIBUTOR

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APPENDIX 1. DESCRIPTIVE STATISTICS.

Variable	Obs.	Mean	Std. dev.	Min	Max
Firm lobby proportion	409	.603	.425	1.34e–06	1
Intra-industry trade	387	.588	.268	.002	.999
Industry concentration	453	39.273	19.255	0	100
Average firm size	453	.047	.183	.001	3.25
Product differentiation	437	5.535	9.513	1.15	108.2
Industry size	451	8891.813	18,972.87	58.5	267,644.3
Tariff	460	.025	.034	0	.193
Import penetration	386	.203	.200	0	.939
Export dependence	387	.135	.125	0	.818
Related-party trade	339	.312	.169	.012	.919
Imported intermediates	385	.046	.113	0	.965

**APPENDIX 2. ROBUSTNESS CHECK INCLUDING BUSCH
AND REINHARDT (1999) MEASURES OF INDUSTRY
CONCENTRATION.**

Intra-industry trade	.367** (.153)
Industry concentration	.007*** (.002)
Political concentration	-1.307 (1.175)
Geographic concentration	-.164 (.336)
Product differentiation (logged)	-.071 (.056)
Industry size (logged)	.050 (.030)
Tariffs (logged)	-.015 (.023)
Sector fixed effects	-.288*** (.075)
Constant	.189 (.296)
Observations	270
Left-censored	1
Right-censored	110

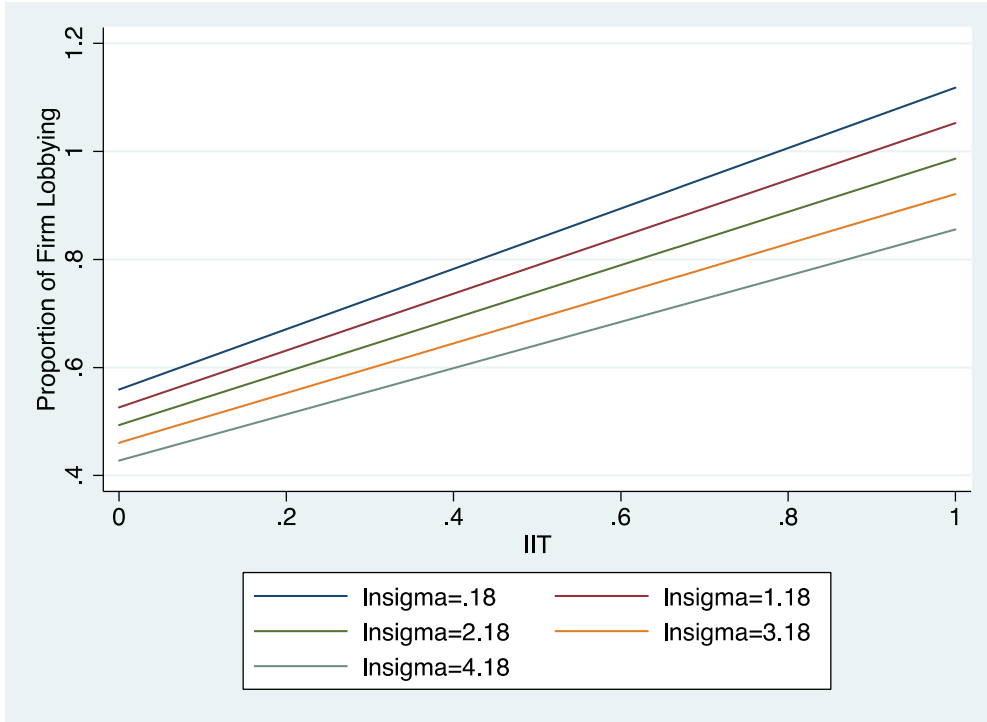
Note: ** $p < 0.05$; *** $p < 0.01$. All standard errors (in parentheses) are heteroskedasticity robust.

**APPENDIX 3. COMPARISON OF BOMBARDINI AND
TREBBI (2012) RESULTS WITH A MODEL INCLUDING
INTRA-INDUSTRY TRADE.**

	Bombardini and Trebbi (2012)	Inclusion of intra-industry trade
Intra-industry trade		.323** (.144)
Product differentiation (logged)	-.107* (.056)	-.099* (.056)
Industry concentration	.004* (.002)	.004* (.002)
Capital/labor ratio	.001*** (.000)	.001*** (.000)
Average firm size	0.211 (0.207)	.261 (.200)
Constant	.691*** (.121)	.488*** (.148)
Observations	285	283
Left-censored	1	1
Right-censored	122	120

Note: * $p < 0.1$, ** $p < 0.05$; *** $p < 0.01$. All standard errors (in parentheses) are heteroskedasticity robust.

APPENDIX 4. MARGINAL EFFECTS OF IIT ON FIRM LOBBYING RELATIVE TO INDUSTRY LOBBYING, AT DIFFERENT LEVELS OF PRODUCT DIFFERENTIATION



Note: Product differentiation (Insigma) is measured as the natural log of the elasticity of substitutability, a measure created by Broda and Weinstein (2006). As Insigma increases, product differentiation decreases and products become more easily substitutable. Thus, the blue line above represents a high level of product differentiation, while the grey line represents a low level of product differentiation.

**APPENDIX 5. CONTROLLING FOR PRODUCT
DIFFERENTIATION USING DISCRETIZED LEVELS OF
ELASTICITY**

Intra-industry trade	.383** (.153)	.368** (.154)	.352** (.153)
High elasticity of substitution	-.057 (.747)		
Medium elasticity of substitution		-.202*** (.076)	
Low elasticity of substitution			.288*** (.091)
Industry concentration	.006*** (.002)	.006*** (.002)	.006*** (.002)
Industry size (logged)	.052* (.030)	.047* (.029)	.059** (.029)
Tariffs (logged)	-.016 (.022)	-.009 (.022)	-.015 (.022)
Sector dummy	-.278*** (.075)	-.290*** (.072)	-.335*** (.075)
Constant	.014 (.246)	.163 (.249)	-.080 (.237)
Observations	277	277	277
Left-censored	1	1	1
Right-censored	115	115	115

Note: * $p < 0.1$, ** $p < 0.05$; *** $p < 0.01$. All standard errors (in parentheses) are heteroskedasticity robust. The high, medium and low categories of elasticity of substitution represent low, medium and high levels of product differentiation, respectively. The three discretized categories are from Bombardini and Trebbi (2012) based on data obtained from Broda and Weinstein (2006).