Globalizing the Supply Chain: Firm and Industrial Support for US Trade Agreements

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Abstract

From 1960 to 2000, manufacturing supply chains became global. To what extent has this growth in offshore outsourcing and foreign direct investment affected industrial attitudes towards trade liberalization? Using data on public positions of US firms and trade associations on all free trade agreements since 1990, it is shown that FDI and input-sourcing are the *primary* drivers of support for trade liberalization. By comparison, direct import competition and export opportunities play a secondary role in shaping support for free trade agreements. This work therefore adds to the literature on the politics of globalization by providing systematic evidence of a link between global supply chains and industrial preferences, and by developing a new model of the determinants of industrial attitudes toward trade.

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Manufacturing supply chains grew enormously in size, speed and complexity with the flowering of global trade after 1960. For some firms, this meant the import of intermediate inputs sourced from foreign manufacturers, or even outsourcing the manufacture of final products overseas. For an even smaller group of firms, efficiency improvements in transport, reduced trade barriers, and improving institutions in host markets permitted the movement of their own production facilities abroad. Though few in number, these offshore outsourcers and multinationals control an enormous quantity of manufacturing output and world trade. Beyond this elite, though, many more producers have come to benefit from the import of intermediates, or through incorporation into the supply networks of export-competitive firms. The globalization of the supply chain implicates all producers, if not equally.

How has this overwhelming reorientation of supply chains outside national boundaries impacted the politics of international trade? Building on the seminal contributions of Milner (1988*b*) and Manger (2009), I argue that a complete account of industrial preferences over trade policy in the current era must place the globalization of supply networks at its center. The sourcing or production of both intermediate and final goods abroad is now a critical element of firms' production strategies. The development of a successful global supply chain often means the difference between profitability and going out of business, and trade agreements facilitate the flourishing of these networks (Baccini, Pinto and Weymouth, 2016). Employing evidence on the public position-taking of US firms and trade associations on all US trade agreements since NAFTA, I show that opportunities to multinationalize production and source intermediate inputs are now the primary drivers of producer preferences over US trade agreements.

In contrast, two remaining components of the model proposed here are important but secondary drivers of industrial preferences over trade. Firms are vicariously integrated into the global economy through the supply of intermediates to export-competitive downstream industries located in their own home market. Where opportunities for such relationships are great, support for trade agreements is increased as the benefits of globalization propagate upwards through the domestic supply chain. Direct export opportunities and import competition – long given precedence in the literature – also determine industrial preferences over trade, especially in industries producing homogeneous commodities, where the effects of trade are sharp and unambiguous. In industries where such impacts are muted, the globalization of the supply chain is therefore especially importance as a determinant of attitudes toward trade.

The primary contribution of this paper with respect to multinational production and intermediates is empirical. Existing studies show that foreign production drives preferences in particular industries, or impacts the design of trade agreements. A similar gap – systematic evidence across all tradables industries that globalization of the supply chain is driving preferences over trade policy – is even more glaring in the study of intermediate inputs. The results presented below fill these voids. The paper also adds to the political science literature by developing the theory of indirect

export opportunities; creating new measures of reliance on upstream imports and downstream exports; and introducing new data on public position-taking. The findings here also contribute to a growing literature on the organizational forms of trade politics, including the choice of whether or not to work through an industry association to pursue most-preferred trade policies. Vertical multinationalization, for example, is a strong driver of firm support for trade liberalization in industries at a comparative disadvantage, undermining industrial unity on trade.

Spurred by a recent set of studies on the harmful labor market consequences of trade with low wage nations,[1] and the resurgence of trade as a topic of electoral contestation in the 2016 presidential election, many have questioned why America rushed headlong into globalization despite its painful toll on particular industries and regions. While strategic and diplomatic reasons are certainly important,[2] public debate over US trade agreements suggests that a coalition of US firms, industries, and peak associations constitute the most important constituency in the push to liberalize trade. But what drove their demands for more globalization? This paper suggests one answer above all others: globalization of the supply chain and the multinationalization of production.

Global Supply Chains and Industry Attitudes toward Trade

What considerations determine industry attitudes towards free trade agreements? The literature on trade politics has always focused on direct export opportunities and import competition, relegating the role of firms as vertically engaged and global consumers of inputs and final products to a secondary status. The shared fate of firms and downstream industries they supply appears to have been almost totally neglected as a systematic area of study.

Of these three factors – offshore production, input sourcing, and the supply of downstream industries – multinationalization has received the most attention as a determinant of industrial preferences over trade. Case studies of particular industries or agreements have shown that multinational firms have contributed to the defense of liberal economic order and the rise of regionalism (Milner, 1988*a*,*b*; Manger, 2005). A second strand of the literature has used systematic data collection across a broader array of industries to examine how trade barriers, PTA formation, and the use of temporary trade barriers are shaped by multinational activity (Manger, 2014, 2012; Lee, 2014; Jensen, Quinn and Weymouth, 2014).[3] This paper fills a gap between these two strands of research

[1] See Autor, Dorn and Hanson (2013) and Pierce and Schott (2012).

[2] On the non-economic motivations behind trade agreements, see Gowa and Mansfield (1993); Mansfield and Bronson (1997); Gowa and Kim (2005); Mansfield and Milner (2012).

[3] Kim et al. (2016) considers provisions to protect foreign investment as a driver of firms' preferences over trade agreements; Dreiling (2000) considers multinationalization in Mexico as one determinant, among many, in public support for NAFTA. Multinationalization has received, of course, great attention as a determinant or outcome of: investment-focused international agreements (Elkins, Guzman and Simmons, 2006; Kerner, 2009; Kerner and Lawrence, 2014; Yackee, 2008; Jandhyala, Henisz and Mansfield, 2011);

by examining the impact of opportunities for multinationalization on the preferences of all tradables industries across a broad array of US industries for all trade agreements since 1990, precisely the era in which global supply chains have flowered.[4]

In comparison to the literature on multinationalization and trade preferences, the scale of work on sourcing intermediates abroad (whether through ownership, at arms-length, or via intermediaries) is small. This is especially true given the extent to which international trade consists of trade in inputs, not final goods. While Gawande, Krishna and Olarreaga (2012), McCalman (2004) and Gawande and Bandyopadhyay (2000) each show that a greater scope for importing intermediates generates lobbying, contributions and lower tariffs, there appears to be little or no complementary empirical work linking opportunities to source intermediate goods and industrial preferences towards trade liberalization.[5]

The upstream impact of trade liberalization on downstream industries for input suppliers has received even less sustained scholarly attention. This does not seem to be for lack of substantive importance: just think of the stakes for the US machine tools or auto parts industry implicated in the success of the auto industry, or of the links between US agriculture and food exports. The systematic examination of the impact of export competitiveness 'by proxy' is therefore a ripe target for both theoretical development and empirical investigation.

Surveying the existing literature, the outstanding opportunity is to show that supply chains matter critically for determining preferences over trade policy, in the present era of global production networks more than ever. This paper seeks to seize that opportunity. The remainder of this section motivates a renewed focus on the supply chain; develops a new conceptual framework for understanding the impacts of generalized liberalization; and presents several hypotheses about the links between supply chains and support for trade among firms and industries.

trade agreements, in general (Büthe and Milner, 2008); political institutions (Jensen, 2003, 2012); policy outcomes (Jensen, Malesky and Weymouth, 2014); and, partisanship (Pinto, 2013; Pinto and Pinto, 2008). These literatures focus primarily on aggregate, rather than industry-specific determinants and impacts of FDI, as in the literature cited in the main text.

[4] There is also a significant literature on determinants and impact of demands for protection from foreign direct investment in host countries (or for other forms of redistribution). See, for example, Goodman, Spar and Yoffie (1996), Crystal (1998), Blonigen and Ohno (1998), Zeng and Sherman (2009), Blanchard (2010), Owen (2013), and Blanchard and Matschke (2015). Because the United States' agreement partners are generally not major home countries for FDI, this paper focuses mainly on foreign opportunities for investment for US firms, rather than threats consequent on inward FDI into the United States.

[5] See the seminal study of industrial trade preferences, Schattschneider's "Politics, Pressures and the Tariff" for discussion of this point. Acharya (2015) provides an in depth formal treatment of lobbying competition between upstream and downstream industries.

Growth in global sourcing

Global trade has expanded enormously since the reconstruction of global economic order after World War II. Total world imports, which accounted for only 9% of world GDP in 1950, reached 14.5% by 1975, 21.5% by 2000, and 27.8% in 2011.[6] The growth of world trade has been accompanied by increasingly global production networks (Henderson et al., 2002). For the largest and most successful firms, these networks comprise complex and transnational supply chains (UNCTAD, 1999); a global division of management, marketing and other headquarters services; and, an increasingly international orientation for sales.

This section concentrates on the first of these aspects – the rise of global sourcing of inputs and final products – leaving global sales, both direct and indirect, for later. Table 1 heuristically divides up the global sourcing options available to a firm which wishes to import foreign products along two dimensions. First, the firm may choose to source only inputs – goods and services purchased by the firm to create its products – or to source the final product itself from abroad.[7] Second, firms may choose to internalize production of the foreign-made good through a strategy of vertical foreign direct investment; to contract at arm's length with a particular foreign producer or producers; or, to purchase foreign-made goods on the open market, with no direct relationship with the foreign producer (Antras and Helpman, 2004).

The growth of global sourcing can be seen in part by charting the growth of traded intermediate inputs (corresponding to the first column of Table 1). Intermediate inputs account for a substantial share of the enormously expanded global trade described above. Miroudot, Lanz and Ragoussis (2009) estimate that around 56% of worldwide trade in goods is in intermediates inputs (the corresponding figure is 73% for services trade).[8] Feenstra, Hanson et al. (1996) and Campa and Goldberg (1997) both find that the share of intermediates which are imported in the USA and elsewhere grew substantially over the 1970s and 80s.

The growth of global sourcing can also be seen in the growth of multinational production within the boundaries of the firm (corresponding to the first row of Table 1). Two sources of data shed light on this. The first of these is direct data on FDI. Foreign direct investment has grown enormously in relation to world trade (Bergstrand and Egger, 2008). UNCTAD reports that annual flows of inward and outward FDI expanded from around 4% of world trade flows in 1970 to a high of nearly 22% of world trade flows in 2000, and have remained between 8 and 15% in each year since then. Consequently, the total stock of inward FDI grew from around 6% to nearly 30% of

[6] The data for these calculations was taken from the Penn World Tables, see Feenstra and Timmer (2015).

[7] This distinction is somewhat artificial ('final products' are combined with headquarters services and so could be conceptualized as just another input) but is highly salient in the data and the identity of the producer. Firms are organized into industries based on their final product and self-identify their primary activities based on the characteristics of their final good.

[8] Bergstrand and Egger (2008) and Yeats (1998) provide lower estimates of 46% and 30% (as a lower bound), respectively.

Table 1: Heuristic breakdown of the choices available to a firm seeking to source goods abroad.

	Stage of production	
Relationship to foreign firm	Inputs	Final products
Within the firm	Vertical FDI as global vertical integration	Vertical FDI as final product offshoring
Outside the firm, direct	Arm's length contracting of inputs with foreign firms	Arm's length contracting of final products
Outside the firm, indirect	Consumption of intermediates via wholesale or retail	Importers/middlemen

world GDP from 1980 to 2011. Of course, not all FDI is oriented towards the importation of inputs or final goods to the home market, as with horizontal or platform FDI strategies which target production abroad for sale in foreign markets. As an alternative, the scale of intrafirm trade, which is more directly indicative of vertical sourcing strategies, can be seen in the US import data on trade with related parties. Related-party imports accounted for 46% of all US imports in 1991, the same in 2001, and 48% in 2011.[9]

The lower right hand square of Table 1, comprising wholesalers and retailers of imported products, is not examined in this paper. So only arm's length contracting of final products remains to be accounted for. Systematic data on this phenomenon are not publicly available; nor is there a plausible strategy available for recovering estimates on the growth of outsourcing of final products. The scale of such activities must be significant, though: think of Foxconn, which manufacturers the iPhone and iPad for Apple, and other contract manufacturers of electronics. As a practical matter, this means that the rest of this paper focuses on opportunities for FDI or for the sourcing of intermediate inputs from abroad, but not opportunities to outsource the production of final goods.

Sourcing, sales and supply: distributive consequences of comprehensive liberalization

Global sourcing complicates the distributive implications of broad trade liberalizations of the kind undertaken in comprehensive trade agreements (Antràs and Staiger, 2012). While there are many effects arising from the increasing complexity of global production networks, building a model of supply chain politics requires some simplifying assumptions. This paper emphasizes three dimensions along which firms and industries might differ to consider the manifold impacts of trade liberalization for a given industry.

[9] These figures are taken from the US Census data on Related-Party Trade, and are available at www.census.gov/foreign-trade/statistics/press-release

The first of these is that trade liberalization can impact trade in own-industry final products; trade in intermediate inputs used by the industry; and trade in the products made by downstream firms who use that industry's products as inputs. For example, when evaluating a proposed trade agreement the US beef industry might consider direct exports of meat; imports of intermediates like feed or veterinary pharmaceuticals; and indirect exports via downstream industries like processed or frozen foods. Care must be taken to distinguish among these channels, as a given firm or industry might suffer, for example, from greater direct import competition even as the downstream firms it supplies benefit from greater export sales.

The second dimension which determines the distributive implications of trade liberalization concerns a firm's location. This paper considers evidence from firms that are all owned in a particular country (here, the US) but which may produce their goods either at home or abroad. These two cases may be referred to as 'local producers' and 'offshore producers' respectively, with the latter comprising both offshore production within the bounds of the firm (i.e. multinationalization) and offshore outsourcing to a foreign contract manufacturer. For example, a US textile producer might support a trade liberalization with the CAFTA-DR countries that expands US imports from those countries if it either owns manufacturing facilities in Central America, or outsources production to a company there. Producers located in the US naturally hold the opposite opinion.[10] This reversal is general: what firms producing in the United States welcome in terms of trade flows, US firms in the same industry which offshore production will generally oppose.

The final dimension along which firms and industries might differ is of course that some will face the trade flows identified above in greater scale then others. Some industries face severe import competition, while others are highly export-competitive, and so will benefit from liberalization. Likewise, some industries will have occasion to deepen their global sourcing strategies and to expand their exports-by-proxy when trade agreements are signed with particular partners. Other industries lack such opportunities, and so the distributive consequences associated with liberalization will be less sharp.

Collectively, then, we have three trade flows which might differentially impact producers in a given US industry depending on whether they are located at home or offshore, and whose effects vary based on the scale and direction of the trade flows. And of course this stylized picture can be complicated even further, for example, with the introduction of product variety, quality differentiation, relationship-specific inputs, and other features highlighted in the growing literature on global production networks. Each of these might be individually fruitful but collectively they are overwhelming. Some factors must be emphasized and some de-emphasized to build a tractable model of producer preferences over comprehensive trade liberalization.

[10] The question of how US multinationals located, for example, in a third country excluded from a proposed trade agreement presents another interesting alternative which is not discussed here.

The proposed model and hypotheses

Given this plethora of forces, this section proposes a model of trade politics in a world of globalizing supply chains. Some of the forces described above are treated in greater depth than others. These decisions in part reflect limitations in data, but also an informed hunch about which elements of liberalization are likely to be most impactful surveying the extant literature. The main contribution of this paper is to focus on the relationship between opportunities to globalize the supply chain and empirical evidence of support for liberalization, so I begin there.

Globalizing the supply chain Consider an industry which faces significant import competition in its own product from some potential trade partner. A natural guess would be that this is an industry opposed to liberalization with that country. But what if that import competition is actually from domestically-owned firms with factories located in the foreign country? Such trade flows are measured by the United States government as a part of related-party imports and should be associated with greater support for liberalization with that country. This seems especially so at the firm-level (not all firms are multinationals, after all) rather than at the association-level, under the assumption that associations represent the interests of an industry, broadly construed.

Hypothesis 1. *Industries with greater imports from a country originating from US multinationals should be more likely to feature support for trade liberalization with that country, especially among firms.*

Offshoring is also achievable through outsourcing so we could easily replace "originating from US multinationals" with "originating from contract manufacturers hired by US firms". I leave this hypothesis aside because there is no available way to measure such imports, but note that offshored production will tend to attenuate any negative impact of imports on support for trade.

Turning from final to intermediate goods, I note that industries that rely heavily on imported intermediates have very strong stakes in trade liberalization. Sourcing intermediates at a reasonable cost can make the difference between corporate life and death for firms in an open economy.

Hypothesis 2. *Industries which source a greater amount of intermediate imports from a country should be more likely to feature support for trade liberalization with that country.*

For this paper, the potentially negative impacts of greater exports of intermediates on firms and industries that intensively employ those intermediates is not considered although this might provide an interesting extension of the model proposed here. I also do not pursue in depth the potential implications of relationship-intensive imports of intermediates. For example, it might be that the benefits of sourcing homogeneous commodities from abroad (e.g. gas and oil) are available to all firms whether their firm has the scale and resources to import. Prices are lower, after all. With relatively differentiated or firm-specific inputs, the gains from importing might be restricted to the largest firms with the deepest global supply chains (Baccini, Dür and Elsig, 2016; Nunn, 2007).

As with own-industry trade flows, the imports of intermediates can be disaggregated into inputs that are imported from foreign-based upstream subsidiaries (which are captured in related-party trade flows of inputs) and inputs imported from abroad either through contracting with foreign firms or via intermediaries. Because relatively few firms are multinationals, it seems especially likely that firm support for trade might be driven by both related and non-related party intermediate inputs while association support is driven by non-related party inputs only. This distinction is not made in the main results because the two measures are highly correlated in the data, however, it is examined in separate models as a tentative additional finding.

The domestic supply chain and exporting-by-proxy Some firms benefit from exporting directly, by sending their goods abroad to foreign consumers who might themselves be firms. Others manage to benefit from export sales indirectly, by selling to local producers who then incorporate those inputs into their direct exports. This leads to support for trade liberalization 'by proxy': the export-competitive firms and industries that an input-producing industry supplies are the direct beneficiaries of liberalization, but the intermediate producer's inputs end up embodied in exports, too.

Hypothesis 3. *Industries whose goods end up incorporated into downstream products which are then exported to a particular country should be more likely to feature support for trade liberalization with that country.*

As above, we leave aside a symmetric notion: that firms and industry associations might be less likely to support trade liberalization if the industries they supply are facing stiff import competition. The reason for this is that a straightforward strategy is available for determining what proportion of an industry's domestic sales end up embodied in downstream exports using input-output tables (as described below). There is no satisfying equivalent strategy for exposure to downstream import competition.

Direct import and export competition The standard Ricardo-Viner interpretation of trade politics holds that industries should be in favor of trade if they are export-competing and opposed to liberalization if they import-competing. It is therefore essential to account for the overall competitiveness of the industry when it comes to the 'ordinary trade flows' that have dominated the study of trade politics. To do so, all models described below include controls for the total exports of each industry, and the total quantity of imports not originating from US multinationals.

A more recent literature has stressed that the Ricardo-Viner model may not be appropriate in industries where products are differentiated, that is, firms monopolize imperfectly substitutable varieties. Product differentiation is the leading explanation for intra-industry trade flows, which make an industry both import- and export-competing. Where intra-industry trade is significant, the key determinant of a firm's preferences over trade policy is whether a firm is an exporter,

not the overall trade orientation of the industry as a whole.[11] Only an exporter has any hope of benefiting from liberalization, while non-exporters face enhanced home market competition from foreign varieties even if their home industry exports relatively more than the foreign industry. For example, **[Blinded]** finds that the Ricardo-Viner model is unsupported empirically in industries producing differentiated products, however it receives strong support in industries producing relatively homogeneous products, like agricultural commodities and basic minerals. The argument that product differentiation moderates the impact of comparative advantage on support for trade is therefore also considered here, but is not a primary contribution of the paper either empirically or theoretically.

The political context of firm and association positiontaking on US trade agreements

The above hypotheses are phrased in terms of general preferences of firms and industry associations over trade. To translate these hypotheses into testable implications, this paper examines public expressions of support for US preferential trade agreements (PTAs) from NAFTA to the present. On the practical side, these agreements are valuable because they generate observable variation on the key dependent and independent variables. Firms and trade associations regularly take pains to publicly support these agreements, but with substantial variation in the extent of this support across industries and agreements. No other trade-related policy issues in the United States reveals even close to as much information about the preferences of corporate America. These agreements also vary enormously in their trade implications, as they span countries which differ markedly in size, endowments, comparative advantage, and the extent of FDI.

On the substantive side, PTAs have received enormous attention from political scientists interested in international agreements, regionalism and the evolution of the liberal order (Dür, Baccini and Elsig, 2014; Milner, 1997; Mansfield, Milner and Pevehouse, 2007). So this paper also contributes to the literature on PTA formation (Mansfield, Milner and Rosendorff, 2002; Whalley, 1998; Büthe and Milner, 2008; Baccini and Dür, 2015). To the extent that preferences over PTAs are shown to be driven by considerations arising from the globalization of the supply chain, this paper provides complementary evidence to work showing that opportunities to multinationalize drive PTA terms and creation (Manger, 2012, 2005, 2014).[12]

[11] For survey and other evidence that firm rather than industry characteristics drive firm preferences over trade liberalization, see Plouffe (2016), **[Blinded]**, and Plouffe (2012). For similar evidence on lobbying behaviors, see Madeira (2014) and Kim (2012).

[12] It is also striking the extent to which the expanded trade agenda items of contemporary PTAs are a response to the demands of firms with global supply chains. Investment provisions, customs facilitation, dispute settlement procedures, and regulatory harmonization are all critical issues for globalizing firms. Non-tariff barriers, technical barriers, government procurement rules, intellectual property provisions, and e-commerce provisions all implicate ordinary market access issues that are key for large, export-capable firms, too.

The choice of public expressions of support for PTAs also raises several questions. First, industries are not unitary actors and the component firms and associations do not always share common attitudes. This paper therefore separately investigates the actions of firms and trade associations. Firms are individual actors free to act on their own, while associations are organizations bound to consider the preferences of all of their members. This distinction seems especially important when we consider aspects of globalization that are available to only a few firms, such as multinational operations. These aspects are more likely to generate support among individual firms than associations as described in the hypotheses above.

The separate examination of firms and trade associations therefore connects this paper to an emerging literature on organizational forms for industries lobbying on trade politics (Bombardini and Trebbi, 2012; Madeira, 2016). This literature documents that formal lobbying is likely to be firm-centered, rather than conducted via a trade association, where trade protection is firm-specific and where intra-industry trade is high. The hypotheses above emphasize that firm (rather than association) positiontaking might be more prevalent where the gains from globalization of the supply chain are most likely to be concentrated in the hands of a small number of firms. The likeliest scenarios with highly concentrated gains are multinationalization of the production of inputs and final products. I expect that these will especially drive firm support for trade.

Are associations then outmoded as political actors in a world of heterogeneous firms? The data does not support that claim: associations are a vibrant part of public positiontaking, and register their opinions on trade agreements in large numbers (even if their participation is uneven across industries). Moreover, associations may represent a valuable site for maximizing firm influence. Larger pro-globalization firms may dominate associations, for example, or conflicts within industries may be muted and so associations remain relevant. Firms may coordinate their efforts with associations to best maximize the political impact of their public positiontaking. I therefore expect that associations will remain active, especially where the gains from globalization are less concentrated, as when firms source inputs from foreign producers.

Another fundamental question is whether we can draw a straight line between the underlying preferences of firms and their public expressions of support for trade agreements. Doing so requires a theory of public position-taking. This paper follows Kollman (1998) in treating positiontaking as a form of outside lobbying: a show of force by special interests directed towards government and society, and designed to convince both that there is support for a given policy. While this outside lobbying is at an elite level, it shares the same goals identified in Kollman (1998). On one hand, activating elite interests signals to politicians that there is robust support for trade liberalization, and that key interest groups accept the parameters of the agreement. On the other hand, this coalition-building activity helps to publicize the agreement – and perhaps increase support and lobbying – among other firms and associations that may be sitting on the sidelines.

Under this approach, private and public preferences ought to coincide closely, if not perfectly.

Firms or trade associations, for example, publicly declaim their support for a trade agreement because they genuinely support some increase in trade associated with the agreement. The main exception to this seems to be those industries which avoid any substantive liberalization as a part of trade agreements, for example, the US sugar industry. In such cases, public support for an agreement is in affirmation of opposition to free trade. Overall, such substantial carveouts from liberalization seem to be rare. Another concern might be that firms or associations are deterred from publicly expressing support for agreements in some systematic way that biases the revelation of genuine support. While this is a possibility, it does not seem consistent with the wide array of support across industries, across agreements, and over time, nor the robust correlations between the expected economic determinants of support and these public expressions.

In contrast to public support to US PTAs, which is ubiquitous and seemingly unencumbered, public *opposition* to these trade agreements by firms and associations is rare. Some of these agreements are with relatively small trade partners; if globalization increasingly concentrates the gains from trade in elite firms and spreads the costs of additional competition across many firms, then there may not be a strong motive to publicly oppose such agreements. Similarly, if intra-industry trade or variation in ability to multinationalize the supply chain divides industries, then the smaller and politically disorganized firms may be undermined in their efforts to oppose liberalization, especially if their usual vehicle for political action – the trade association – remains on the sidelines. It may also be that firms self-censor public expressions of opposition, for fear of being labeled 'protectionists' or due to a sense of political inefficacy. Given the relative paucity of public expressions of opposition, this paper focuses on the variation that is available to exploit: industries where there was public support for the PTAs and industries where there was not.

These agreements are certainly not unopposed, however. Labor unions, human and labor rights NGOs, environmental groups, progressive church groups, and ordinary US voters regularly work to defeat these trade agreements (as do the politicians that represent these constituencies). These actors are particularly motivated where opportunities to globalize the supply chain are significant, due to offshoring-induced job losses and corporate exploitation of weaker regulatory, labor, and environmental standards in partner countries. There remain bastions of protectionism in industry, too. The steel and machine tools industries featured significant public opposition to the US-Korea trade agreement, for example, and certain agricultural industries have fought to exclude their products from substantive liberalization. By comparison, the political coalition of firms and associations that strongly support these agreements is one-dimensional. Corporate America is the special interest pushing these agreements, and its efforts absolutely dwarf the activity of any other groups that arise to support these PTAs. The public expressions of support that this paper examines are therefore not only valuable as evidence of corporate attitudes, but also politically important: there are virtually no other organized interests defending globalization.

A final question about translating the hypotheses above into empirical models concerns how

firms and industries evaluate trade agreements. I hypothesize that these evaluations are driven by the extent of trade flows among the partner countries, past, present and future. Past and present trade flows act as a guide to the comparative advantage of, and opportunities to invest in, foreign countries. Of course, such flows are limited by barriers to trade that may be reduced by trade agreements, so an approach focusing on past trade flows might fail to capture opportunities generated by reductions in barriers that are highly uneven across industries. On the other hand, trade agreements may expand trade significantly but evenly across industries, or may serve to guarantee existing trade patterns (Mansfield and Reinhardt, 2008). Trade flows may even anticipate trade agreements, too. In these cases, current trade flows are a sound guide to future trade flows, and so trade flows both current and anticipated will drive public positiontaking.[13] From this perspective, trade flows are relatively stable across countries, industries and time, and agreements serve mainly to lock in and build on existing successes. Such an approach seems especially apposite for US trade agreements, all of which have been concluded with partners that are already members of the WTO, and that is the perspective adopted in this paper.

This still leaves a variety of valid approaches to measure the importance of an agreement to a particular industry, so the one taken here is chosen for breadth, robustness and simplicity. I consider trade flows between two countries over a long span of time (2005-09 and, as robustness check for every model, 2010-14) in order to smooth over year-to-year variation in trade. These flows are used as a snapshot of the stakes involved for an industry that might secure (and give) preferential access to some country as part of a PTA. It is assumed that the impact of a PTA is proportional to the size of these stakes. A typical result in the main text therefore looks like the following: industries that sourced a greater quantity of inputs from country X from 2005 to 2009 were more likely to support a trade agreement with that country.

This approach may be problematic for agreements that are distant in time from 2005-09, particularly NAFTA, if trade flows are highly variable over time. Additional subset analyses exclude trade agreements most distant from the available measures of trade flows. I also consider alternative model specifications which use the pre-agreement and post-agreement trade flows as alternative measures of the stakes. This approach requires cutting two agreements (NAFTA and Jordan) for the pre-agreement trade flows approach, and one agreement (NAFTA) for the post-agreement trade flows approach, because the related-party trade data is only available for 2002-2014. These measures are also noisier because trade data can be variable year-on-year, though I find very similar results to those contained in the main text.

[13] As an empirical matter, early trade flows are highly correlated with later trade flows in these data. Logged US exports, non-related part imports, and imports from its trade partners in 2002-04 and 2012-14 are correlated at .83, .85, and .82, respectively. From 2012 to 2014 the correlations are .56, .64, and .70, illustrating how the year-on-year variation exceeds variation across the decades among averages.

Data and Measurement of Concepts

Public support for US trade agreements

The outcome variables for this paper are built using an archive of public expressions of support by US manufacturing, mining, and agriculture firm and industry associations for all 13 US free trade agreements from NAFTA to the present.[14] These public expressions of support come in various forms. By far the largest source of data on public expressions are *ad hoc* coalitions, which have formed to support every trade agreement from NAFTA to the present with the sole exception of the Jordan-US FTA. For example, 1124 agriculture, mining, and manufacturing firms and 88 trade associations joined an *ad hoc* coalition to support NAFTA called "USA*NAFTA". These coalitions usually have unambiguous positions. USA*NAFTA was in favor of the NAFTA agreement, and so all firms and associations that joined the coalition are coded as supporting NAFTA, too. These coalitions are generally finalized and most active once negotiations are concluded, and time their efforts to coincide with Congressional debate on the trade agreement. They often create a public website; send a representative to Congressional hearings; or write letters to members of Congress or the Executive branch to express their strong support for the agreement in question.

Congressional testimony is the second main source of information on firm and associations attitudes, but I also make use of USTR submissions, government reports, and press releases. These sources require careful reading to determine if a clear and unambiguous position was taken on the trade agreement in question, and quotes are cited from each document for all claimed positions in supporting materials for the dataset. In the case of NAFTA, these extra sources provide information on an additional 148 firms and 36 trade associations that supported the agreement, as well as confirming 111 firm and 30 association codings from the USA*NAFTA coalition. This is typical: many firm and association expressions of support are repeated across multiple venues. Such redundant codings improve confidence that public expressions are meaningful.

The top half of Table 2 illustrates these properties of the data.[15] On the left hand side, summary statistics are provided on the number of firms that supported each trade agreement in the # Support column. For example, 1272 unique firms supported NAFTA. These codings are drawn from 20 separate sources of data recorded in the # Sources column (3 pro-NAFTA coalitions and

[14] These data were collected by the author and used in **[Blinded]**, although the position-taking data on NAFTA are new to this paper.

[15] Note that two sets of agreements (the Bahrain, Morocco, and Oman agreements; and the Colombia and Panama agreements) shared a single coalition simultaneously pushing for all of the agreements (the U.S.-Middle East Free Trade Coalition and the Latin America Trade Coalition, respectively). Because these coalitions are the main source of codings for these agreements, the two sets of agreements are treated as single cases to avoid over-counting evidence of support for related agreements as support for independent agreements. All trade flow variables for these sets of agreements or agreements with multiple partners are summed across the countries.

Table 2: Counts of US firm and association support for FTAs.

		Firms			Associations		
Agreement	Year	# Support	Avg. Sources	# Sources	# Support	Avg. Sources	# Sources
NAFTA	1994	1272	1.10	20	124	1.71	20
Jordan	2001	7	1.00	3	5	1.00	2
AUSFTA	2004	135	1.10	5	48	1.24	11
Chile	2004	90	1.00	4	32	1.33	4
Singapore	2004	79	1.36	5	15	1.47	5
CAFTA-DR	2005	184	1.18	5	69	2.07	22
Bah/Mor/Omn	2006	44	1.11	5	16	1.25	5
Peru	2007	36	1.06	4	46	1.46	8
Pan/Col	2011	269	1.12	14	121	1.81	41
KORUS	2011	177	1.31	36	170	1.98	43

17 Congressional hearings). The average number of sources for each firm was only 1.10 because most firms appear in the large coalition described above and nowhere else. This information is contained in the Avg. Sources column. The analogous information on industry associations is included in the final three columns of the table.

Firm and association positions are used to construct two industry-level measures of the extent of support for a given trade agreement which are the main outcome variables in the analysis below. These variables are constructed at the 6-digit NAICS level for each individual agreement so the unit-of-analysis for this study is the industry-agreement. The data cover 403 NAICS industries in agriculture, mining and manufacturing across 10 agreement (or agreement clusters), so the total number of observations for most models is 4030. Some of the robustness checks employ variables unobserved in particular sectors or industries, reducing the sample size.

The first outcome variable is a count of the number of firms that supported a given agreement in a particular industry, and is written in the regression tables below as # Firms. Note that a single firm might span multiple 6-digit NAICS industries creating dependence among the observations that is addressed below. About 48.9% of agreement-industries have at least one firm supporting the agreement, while the average across all observations is 1.72 firms. The second outcome variable is a dichotomous measure of whether an industry trade association publicly expressed support for the trade agreement in question. A trade association publicly supported the trade agreement in about 31% of the agreement-industry cases.

Measurement of imports arising from US multinationals

US imports of foreign-made products might be associated with support for trade agreements if those imports emanate from US multinational corporations. In order to gauge the scale of this intra-firm trade, I employ data on imports from related parties provided by the US Census Bureau at

Table 3: Summary statistics for all variables.

Variable	Mean	SD	Min	Max
Outcome variables:				
# Supporting firms	1.72	3.21	0	32
Supporting assoc.	0.31	0.46	0	1
Supply chain variables:				
ln Related-party imports	3.12	3.09	0.00	10.64
ln Inputs	5.93	1.28	0.82	10.89
... of which related-party	5.67	1.26	0.37	10.52
... of which non-rel. party	5.38	1.44	0.19	10.38
ln Downstream exports	5.50	2.10	0.00	9.55
Own-industry trade and other controls:				
ln Imports (Non-rel. party)	4.19	2.96	0.00	10.58
ln Exports	5.50	2.75	0.00	10.18
Homogeneous	0.10	0.31	0.00	1.00
Mod. differentiated	0.28	0.45	0.00	1.00
Differentiated	0.62	0.49	0.00	1.00
ln Sales	9.83	0.51	8.08	11.76

Notes: The total sample is 403 industries across 10 agreements (or agreement clusters) for $N = 4030$.

the 6-digit NAICS level.[16] While imports originating from the foreign affiliates of US corporations are related-party imports, other relationships also count as related party transactions, including familial relationships, business partnerships, and employer-employee relationships. Although these other forms of related-party transactions are likely to be small in scale (multinationals and large firms dominate trade flows, especially in agriculture, mining and manufactures) they nonetheless introduce error in measuring imports originating from the affiliates of US multinationals. Foreign firms invested in the US that import from their home-market parent companies also fall under the related-party imports umbrella. This error is mitigated by the fact that the US is generally much more invested in its trade agreement partners than they are in the United States. Among all of the US trade agreement partners examined in this paper, US foreign direct investment in those countries exceeded their investment in the US by a factor of 2.4. For the manufacturing sector only, the number is even higher, at 2.7.

The main results therefore employ average related-party imports from 2005 to 2009 as a proxy for imports from US multinationals, relying on the arguments above that these sources of error ought to be modest for most of the sample. This variable is referred to as Related-party imports and is always added to one and logged. An alternative proxy for the potential of imports to come from

[16] Related-party imports are defined under the administrative provisions of the Tariff Act of 1930 §1401a(g) as imports entering as part of a transaction among related parties, which may include '[a]ny person directly or indirectly owning, controlling, or holding with power to vote, 5 percent or more of the outstanding voting stock or shares of any organization..."

US multinationals is also employed in robustness checks. This variable is constructed using data on US direct investment abroad provided by the Bureau of Economic Analysis, and is described fully in the appendix. It is referred to as DIA.

Measures of imported inputs and downstream exports

The measure of imported inputs for each 6-digit NAICS industry is constructed using the Benchmark Input-Output table for 2002 (the last available) from the Bureau of Economic Analysis. This table married to import data (also provided by the US Census Bureau) to generate a figure which represents the estimated total value of all intermediate inputs used by a given US industry that are imported from a particular agreement partner or partners. The Supplementary Direct Requirements Table reports the percentage of value added in the industry in column j which is accounted for by an input from the industry in row i.[17] I refer to this matrix of input-output coefficients as IO, and IO_{ij} represents the proportion of industry j's value added accounted for by input i.[18] The IO matrix is used to determine the total value of each input used by each industry, which is denoted here as I_{ij}. For industry j, the total value of input i used is $I_{ij} = IO_{ij}R_j$ where R_j is total industry revenue. For example, if the US auto industry is a \$100 billion a year industry and 1% of its value comes from manufactured glass products according to the input-output table, then its total glass inputs employed are \$1 billion $= .01 \times$ \$100 billion.[19]

The percentage of each domestically employed input which is imported from a trade partner k is given by $p_{ik}^{Imp} \equiv \frac{Imp_{ik}}{R_i + Imp_i}$, where Imp_i represents all imports of input i and Imp_{ik} represents only those imports of input i coming from country k. Note that the denominator represents the total value of all of input i used in the US. For example, Canada and Mexico supply about 4% of all glass products that US industries consume, whether made in the US or abroad. At this point, it is assumed that imported inputs are deployed proportionally across all US industries. So if a proportion p_{ik}^{Imp} of input i is imported from country k then $p_{ik}^{Imp} I_{ij}$ represents the total amount of imports from country k of input i used by industry j. Using our running example, it would be estimated that the NAFTA countries supply $.04 \times$ \$1 billion $=$ \$40 million in glass to the US auto industry annually.

To measure the total dependence of the US auto industry on imported inputs from Mexico and Canada, one must then sum across all of the inputs supplied to the auto industry by Mexican and

[17] Note that both input and output industries are defined at the 6-digit NAICS level.

[18] Note that $\sum_i IO_{ij} = 1$ ordinarily, but the diagonals of the input-output table are set to zero in order to focus on value added from inputs outside the industry itself, so as not to conflate import competition with intermediate imports.

[19] These numbers are rounded to even figures to simplify the presentation, but are in the neighborhood of the true figures. The industries described here are NAICS codes 336111 (Automobile manufacturing) and 327215 (Glass product manufacturing made of purchased glass).

Canadian industries, like glass, fabric, steel, leather, and auto parts. This yields the measure of dependence on inputs from a particular country:

Definition 1. *The total estimated value of intermediate inputs used by industry j imported from country k is equal to*

$$\text{Inputs}_{jk} \equiv \sum_i p_{ik}^{Imp} I_{ij}.$$

This variable is referred to in the tables below as Inputs, and is averaged across all years from 2005 to 2009 before being logged. This measure is also decomposed into versions using only related-party imports and non-related party imports, in order to consider potential differences in inputs sourced as part of multinational supply chains within the bounds of the firm and inputs sourced abroad outside the bounds of the firm.

The quantity of locally sold intermediate goods that end up as downstream goods which are then exported is defined analogously. The percentage of downstream (i.e. final) goods that are exported to country k as $p_{jk}^{Exp} \equiv \frac{Exp_{jk}}{R_j}$ where Exp_{jk} is the total exports of industry j to country k. As above, I use the expression I_{ij}, the total amount of input i used by industry j. I also define $p_i^{Imp} \equiv \sum_k p_{ik}^{Imp}$ as the percentage of a particular input that is imported from the world to subtract off imported inputs which are repackaged into downstream exports. (US input-producing industries garner no benefits from imported inputs incorporated into exports.) For example, if the US handtools industry employed $1 billion in US-made milled steel each year as an input, and then exported 0.4% of its products to South Korea annually, we would estimate that about $4 million $= .004 \times$ $1 billion of US steel ends up in South Korea via the export of US-made handtools. To determine the total dependence of US steel mills on indirect exports to South Korea, I sum across all of the downstream industries supplied by US steel mills, like tools, electronics, transportation equipment, and machinery.

The formal definition of total US-made intermediates that are then exported as downstream goods is then given by the following:

Definition 2. *Downstream export sales for input i to country k are equal to*

$$\text{Downstream exports}_{ik} \equiv \sum_j (1 - p_i^{Imp}) I_{ij} p_{jk}^{Exp}.$$

As with the other trade measures, this variable is averaged across the years 2005-09 and logged.

Direct import and export sales, product differentiation, and industry size

All of the models examined below include controls for own-industry imports and exports, to ascertain the effects of own-industry competition on support for liberalization. The export variable is

simply the average exports of the industry over 2005-09 measured at the 6-digit NAICS level taken from the NAICS Related-Party Trade web application hosted by the United States Census Bureau. Related-party imports are separated from all other imports in order to distinguish between imports that likely originate from US multinationals and imports originating from foreign manufacturers. This measure of import competition with related-party imports removed is referred to as Imports in all regression tables, leaving the parenthetical 'non-related party' implied.

These trade variables are both interacted with a measure of product differentiation from Rauch (1999). The original measure classifies industries as exchange-traded products available on an organized commodities exchange; reference-priced products priced in industry trade publications; and all other products. This measure is concorded into the 6-digit NAICS industries employed here, and its three levels are referred to as Homogeneous, Moderately differentiated and Differentiated, respectively. Exchange-traded products share a common price and are freely substitutable, and so are homogeneous. Products that are neither exchange-traded nor reference-priced are likely to be differentiated, with each variety garnering a different price based on its product characteristics and attributes of the company producing it. Referenced-price goods are an intermediate case, insufficiently standardized to be traded on a commodity exchange but sufficiently standardized to be given a target price, at least for generic varieties. This measure is used to test the idea that own-industry trade flows are less relevant when products are differentiated. Product differentiation means that varieties may be monopolized by individual producers who can benefit from export opportunities even as other firms in their industry lose out from greater import competition.[20]

All of the models include a control for industry size which is based on total sales from 2005 to 2009. Due to changes in the NAICS nomenclature, this measure is only available in 2007 for some industries. Total sales over these years are always divided by the number of years in which sales data are available.

Empirical aims and model specification

The hypotheses presented above suggest a set of correlations which we seek to demonstrate are present in the data. Rather than pursue bivariate relationships, each correlation is examined conditionally, holding constant other determinants of support for trade agreements. Because it is not clear theoretically which of the explanations for support for trade is causally prior, it makes the most sense to examine the relationships among all variables simultaneously. This approach provides some confidence that a correlation between related party imports and support for trade, for example, is not spurious and in fact driven by the impact of non-related party imports on support

[20] The Rauch (1999) variable therefore captures the most theoretically relevant aspects of differentiation here, whether firms in an industry share a common price and whether their product is a unified commodity or not. This measure has been shown to correlate positively with markups and negatively with absolute price elasticities, both indicators of the ability to differentiate.

for trade.

All of these relationships are modeled using generalized linear models. The linear predictor for the regression models is:

$$\begin{aligned}\theta \quad = \quad & \beta_0 + \beta_1 \ln \text{Rel. party imports} + \beta_2 \ln \text{Inputs} + \beta_3 \ln \text{Downstream exports} + \beta_4 \ln \text{Sales} \\ & + \boldsymbol{\beta_{5-12}} \cdot \text{Differentiation} * (\ln \text{Exports} + \ln \text{Imports}).\end{aligned}$$

The index of firm support for trade each trade agreement is a count variable which is modeled using negative binomial regression

$$\text{E}[\#\ \text{Firms}] = \text{Poisson}(\varsigma \text{Exp}[\theta])$$

where ς models over- or under-dispersion in the data and is distributed gamma. Association supports is modeled using logistic regression:

$$\text{E}[\text{Assoc. support}] = \text{InvLogit}(\theta).$$

As noted above, there is dependence among the units across industries, especially within particular agreements. In order to partially deal with these dependencies, standard errors are clustered at the agreement-3-digit NAICS level for all regression models presented. Such clustering adjusts the standard errors for idiosyncratic shocks to industries for each agreement which might raise or lower the chances of support.[21] A series of random intercept models are examined in the Online Appendix towards the same end. In separate specifications, random intercepts are considered for the agreement; agreement-3-digit NAICS dummies; for each 6-digit NAICS industry; and for both agreement and 6-digit NAICS industries. These models, of course, are only valid if the country-agreement shocks, for example, are independent of the the unit-level predictors.

All of the results in the text are presented as expected differences. The clustered variance-covariance matrix is used to draw from the estimated sampling distribution of the coefficients and the empirical distribution of the covariates is used for all simulations (but the variable under consideration). For example, a reported expected difference of .94 on the # Firms outcome for the Input variable indicates that increasing inputs from their 25th to their 75th percentile would predict an increase of .94 firms supporting an agreement for a typical industry. An expected difference of .15

[21] The appendix explores an alternative method for addressing dependence among the outcome variables using a bootstrap method. I resample among supporting firms and associations with replacement to construct 5000 bootstrapped dependent variables to better reflect the additional uncertainty generated by multi-product firms. The bootstrap standard errors are then calculated by fitting the model on 5000 bootstrapped datasets. The bootstrapped standard errors are not substantially greater than the ordinary standard errors, suggesting that multi-product firms are not contributing to overprecision in the estimates presented in the main text.

on the association variable indicates a .15 higher probability of an association publicly supporting agreement for the same change in the Inputs variable. Note that all estimates are based on the median expected difference. This mainly affects the # Firms outcome which is quite skewed. Its mean is 1.72 in the data, but the median expected number of firms is 1.13 and so all differences should be interpreted with respect to the latter number. For example, the .94 estimate above implies increasing the median expected number of firms from 0.78 (when Inputs are held at their 25th percentile) to 1.73 (when Inputs are held at their 75th percentile). Hypothesis tests are conducted using quantiles of the simulated differences.

Results

This section mirrors the theoretical development and introduction of measures by focusing sequentially on two sets of results. First, opportunities to globalize the supply chain via own-industry FDI and the foreign sourcing of intermediates (whether inside or outside the bounds of the firm) are associated with significant increases in support for trade agreements among associations but especially firms. These predicted effects are so large that opportunities to globalize the supply chain can meaningfully be called the primary explanation for variation in attitudes toward trade among firms. Second, opportunities to export indirectly via sales of inputs to home-country exporters are associated with increases in support for trade agreements among firms, but only inconsistently among trade associations.

Globalizing the supply chain

Does greater potential for globalization of the supply chain through foreign direct investment or the import of foreign-made intermediates increase expected support for free trade agreements? Table 4 show that among firms the answer to this question is unequivocally yes. The measure of the ability to multinationalize production, Related-party imports, is positively and significantly associated with support for liberalization among firms. For a typical industry, increasing the logged Related-party imports measure from its 25th to its 75th percentile increases the average number of firms expected to support that trade agreement from about .93 to 1.38, a difference of .45 firms. The third column of Table 4 also presents a first check of this finding, by converting the trade flows into flows as a percentage of industry sales.[22] This alternative measure suggests a similarly positive link between related-party imports and support for liberalization among firms.

Among trade associations, the links between Related party imports and support for liberalization are also positive and substantively significant. Moving from the 25th to the 75th percentile

[22] These are similar to the import and export penetration variables commonly used in studies of trade. The rank of the trade flows is used due to the extreme skewness of the unlogged trade data.

Table 4: Predicted changes in support among firms and associations for US trade agreements.

	ln variables		rank %-age vars.	
Outcome:	# Firms	Assoc.	# Firms	Assoc.
Related-party and intermediates trade:				
Rel. party imports	0.45^{***}	0.10^{***}	0.22^{**}	0.06^{**}
Inputs	0.95^{***}	0.13^{***}	0.90^{***}	0.12^{***}
Downstream exports	0.13^{***}	0.00	0.20^{***}	0.00
Ordinary trade:				
Imports × Homog.	−0.06	-0.20^{***}	0.01	-0.16^{***}
Imports × Diff.	0.07	0.09^{**}	-0.32^{**}	0.03
Exports × Homog.	0.18^{**}	0.13^{***}	0.58^{***}	0.34^{***}
Exports × Diff.	−0.02	-0.04^{***}	0.84^{***}	0.03
Other controls:				
Sales	0.19^{***}	0.02^{**}	0.58^{***}	0.08^{***}
Homog. → Mod.	0.02	−0.05	0.04	−0.06
Homog. → Diff.	0.36^{**}	−0.17	0.32^{*}	−0.16
Pseudo-R^2	0.30	0.12	0.29	0.12
Sample	4030	4030	4030	4030

Notes: All estimates are first differences; changes in continuous variables are from $25th$ to 75th percentile. Median expected number of firms supporting is 1.13; median expected probability of association support is .29. Standard errors are clustered at 3-digit NAICS-agreement level. $^{***}p < 0.01, ^{**}p < 0.05, ^{*}p < 0.10$.

of the Related-party imports variable increases the probability of association support by around .10, from .24 to .34. In the robustness checks examined below, these effects are found to be somewhat smaller or insignificant using alternative model specifications and measures. In contrast, the results on firm positiontaking and Related-party imports are consistently large and significant. I conclude that opportunities for imports coming from US multinationals abroad are a key driver of firm preferences, while the evidence is somewhat weaker that such imports drive association positiontaking. Nontheless, association support is positively linked to multinationalization, so firms are successfully encouraging their associations to support trade agreements that promise significant opportunities to invest abroad.

Opportunities to source intermediate inputs are even more strongly associated with support for US free trade agreements. This is true at both the firm and association level. Increasing the measure of imported intermediates coming from a particular agreement partner(s) from its 25th to its 75th percentile increases the predicted number of firms supporting the agreement in that industry by .95, more than doubling expected support for the agreement from .77 firms to 1.72 firms. The expected difference is almost as large among associations, where a similar change in the volume of intermediate inputs imported increases the probability of an association supporting the agreement from .23 to .36. The predicted differences are nearly identical using the trade flows

Table 5: Predicted changes in support among firms and associations for US trade agreements.

	ln variables		rank %-age vars.	
Outcome:	# Firms	Assoc.	# Firms	Assoc.
Intermediates trade, related-party and not:				
Inputs (rel. party)	0.48^{***}	-0.01	0.50^{***}	-0.01
Inputs (non-rel. party)	0.49^{***}	0.15^{***}	0.52^{***}	0.16^{***}
Pseudo-R^2	0.31	0.13	0.30	0.12
Sample	4030	4030	4030	4030

Notes: All remaining variables suppressed. All estimates are first differences; changes in continuous variables are from 25th to 75th percentile. Median expected number of firms supporting is 1.13; median expected probability of association support is .29. Standard errors are clustered at 3-digit NAICS-agreement level. $^{***}p < 0.01, ^{**}p < 0.05, ^{*}p < 0.10$.

as a percentage of sales versions of the variables. Opportunities to import intermediates are a key driver of preferences.

As described above in the discussion of own-industry imports, it is plausible that related-party intermediates and non-related party intermediates might have different impacts. Opportunities to source intermediates via direct investment in foreign affiliates would seem to be restricted to relatively few firms, and so not a likely driver of broad industrial preferences as embodied in trade associations. Table 5 reports results from the same models as 4, but with the intermediate inputs variable disaggregated between related-party imports and non-related party imports (expected differences for the other variables are suppressed to conserve space but the other variables included in the models are identical.) The results suggest that there is a meaningful difference between firms and associations. Firm positions are driven by both opportunities to multinationalize intermediates production within the firm and outside the bounds of the firm. In contrast, trade association positions are not meaningfully associated with related-party imports of intermediates.

The differences between firms and associations can now be succinctly summarized. The foreign production of final goods within the boundaries of the firm and the foreign sourcing of inputs made either within or outside the boundaries of the firm are all key drivers of firm support for US trade agreements. Of these three, only foreign-made inputs made outside the boundaries of the firm is a consistent driver of support for trade agreements among associations across all models examined in this paper. These patterns make sense, because multinationalization of production at any stage of the supply chain is generally only done by an elite stratum of large and highly productive firms. The sourcing of inputs made by foreign corporations is feasible for a broader set of firms, and so associations are more likely to act because a broad set of firms in their industry favors agreements with such opportunities.

A key argument of this paper is that the globalized supply chain has fundamentally altered the scale of industrial support for trade liberalization. To wrap up this subsection I therefore consider

Table 6: Counterfactual simulations of number of firms or association supporting trade liberalization.

Scenario: De-globalization of Supply Chains				
	Current levels	Predicted levels	Difference	95% CI
No. firms support	1.13	0.64	0.49	[0.41, 0.57]
Pr. assoc. support	0.29	0.20	0.09	[0.07, 0.11]
Scenario: Sharp Deterioration in Relative Exports				
	Current levels	Predicted levels	Difference	95% CI
No. firms support	1.13	1.03	0.10	[0.00, 0.20]
Pr. assoc. support	0.29	0.23	0.06	[0.03, 0.09]
Scenario: Collapse of Downstream Exports				
	Current levels	Predicted levels	Difference	95% CI
No. firms support	1.13	1.07	0.06	[0.02, 0.10]
Pr. assoc. support	0.29	0.29	0.00	[-0.01, 0.02]

Notes: All estimates are first differences from models 1 and 2 of Table 4 among the complete sample ($N = 4030$). Changes in variables are 1/10 the observed value or 10 times the observed value. Standard errors are clustered at 3-digit NAICS-agreement level.

the extent to which the rise of global sourcing via imported intermediates and FDI have increased the rate of public expressions of support for trade liberalization among US industries. To answer this question, Table 6 presents a series of counterfactual simulations which generate predictions about rates of support for trade liberalization under a variety of scenarios. The first scenario (called 'Current levels') considers the US industrial map across all 13 agreement cases examined in this paper as they are in real life. A median expectation of 1.13 firms per industry express public support across all agreement cases; 29% of industries have at least one association in support of a given trade agreement.

The first counterfactual considered is where the related-party imports and total imported inputs of those industries are decreased by 90% for every observation in the entire data. This drastic reduction is meant to mimic a world with few opportunities to globalize the supply chain. One way to interpret this estimates is the following: what type of support for liberalization would we expect to see for a typical industry if we removed almost all global sourcing opportunities while holding all other industry characteristics constant? The second way to interpret the counterfactuals is somewhat fanciful, because of concerns over partial versus general equilibrium and extrapolation, but also more vivid. What would happen to support for trade liberalization in the United States if trade agreements governed just trade in final goods, with virtually no opportunity to increase imported inputs or to multinationalize production?

Under either interpretation, the scale of the impact of intermediates and FDI on support for trade is enormous. These estimates are presented in the top third of Table 6. Reducing these opportunities to very low levels is predicted to reduce the number of firms supporting these agreements

by over 43%; the proportion of industries with trade associations which support trade liberalization is cut by over 31%. In order to draw out the comparison with other determinants of support for liberalization, the middle third of Table 6 considers an alternative counterfactual scenario. Instead of reducing each industry's opportunities to globalize the supply chain, we instead consider reducing their opportunities to export (to 10% of their current totals) and increasing import inflows by a factor of 10. Despite these extreme changes, the predicted change in support for liberalization among firms is dwarfed by the changes induced by a reduction in opportunities to globalize the supply chain. Among trade associations the changes in predicted support are comparable, although they are still greater for the 'de-globalizing the supply chain' scenario.

Before describing the remaining results, it is worth reflecting on these findings. The data collected for this project are comprehensive: all US preferential trade agreements since NAFTA are included, and all public expressions of support for these agreements that could be located have been included in the outcome. While the idea that globalizing the supply chain generates support for trade is not new (Milner, 1988*b*), this is the first large-N test of this proposition using data on revealed preferences of firms and industries. The main results are entirely robust to the inclusion of likely alternative explanations, like industry size, comparative advantage, and downstream exports. And the evidence is overwhelmingly in support of the proposition that globalizing the supply chain has grown the base of support for free trade and increased the scale of the pro-trade industrial coalition in the United States.

And there are several reasons to think that these expressions of support, and the concomitant growth of the pro-trade coalition, are likely to be politically meaningful. US firms and corporations account for virtually all of the special interest support for US trade agreements. Union and NGO support for these agreements, in comparison, is exceedingly sparse. US policymakers also evidently care about the positions of firms and industries. They solicit extensive feedback from corporate stakeholders through public submissions to the USTR, trade advisory committees, and congressional testimony. These efforts are significant, and are then reported in great detail in Congressional Research Service reports, for example. Because the supply chain forces examined above have such large impacts on industrial support, it is reasonable to infer that these forces have been a key driver of US trade policy.[23]

Indirect exports via supply of downstream Exporters

Table 4 shows that Downstream exports have a statistically significant and meaningful impact on the number of firms supporting trade liberalization. Increasing the logged Downstream exports

[23] A more formal examination of this claim also seems like a key site for future research. For example, are members of congress more likely to vote for a trade agreement when firms in their districts have publicly supported (or lobbied) on the agreement?

variable from its 25th to its 75th percentile increases the expected number of supporting firms from 1.09 to 1.23. It was hypothesized that the links between downstream exports and association support for trade agreements would be similarly positive, but the results do not support that contention. This is also true across a wide variety of robustness checks and so does not seem to be something idiosyncratic about the specifications in Table 4. This was not predicted.

In order to provide a sense of the impact of downstream exports, the bottom third of Table 6 considers a reduction of all of the observations' Downstream exports by 90% from the actual observed level. The predicted reduction in firm support for trade liberalization is statistically significant but somewhat modest compared to the other factors explored in this study. As a determinant of firms' preferences over trade agreements, it seems that indirect exports via inputs sales to downstream firms and industries that are export competitive are a consistent but second order driver preferences, especially in comparison with opportunities to globalize production and supply.

'Ordinary trade': import competition and export opportunities

The third set of results consider the impact of own-industry trade flows of the sort that are usually believed to drive trade politics. The literature has found that the impact of imports and exports is conditional on the extent of product differentiation. On the associations side, the results strongly support this claim. Where products are relatively homogeneous, greater import flows have very negative effects on the chances that a trade association supports the trade agreement. Greater export flows strongly increase support. To illustrate, increasing imports from their 25 to their 75th percentile generally reduces the probability a homogeneous good industry's association supports an agreement by .20. (Note the proportion of homogeneous good industries with public support for an agreement is .37.) An increase in exports increases support for an agreement by .13. In contrast, where products are relatively differentiated, these relationships generally fade to insignificance or even change sign.

Among firms these relationships are generally variable in their direction across specifications. This likely reflects a lack of firm position-taking in homogeneous product industries. 59.3% of homogeneous good industries have no firms at all taking a position, while 45.3% of all differentiated good industries have no firms taking positions. Among industries where at least one firm took a position, that firm was the *only* firm doing so among 59.4% of homogeneous good industries but only 33.9% differentiated good industries. More starkly, the average number of firms taking a position in homogeneous industries is just over 1, while for differentiated product industries the same figure is over 2. In other words, firm position-taking in homogeneous good industries is scarce and idiosyncratic as a source of data, explaining the variable results.

Returning to the counterfactual claims in Table 6, it is worth pointing out again how impactful changes in opportunities to globalize the supply chain are compared to the ordinary trade channels

which drive trade preferences in the Ricardo-Viner approach. Even the drastic proposed counterfactual (a reduction of an industries export-import ratio by a factor of 100) has only modest effects on firm positiontaking, reducing support from 1.13 to 1.03 firms. The effects on associations are somewhat stronger, reducing the probability of association support from .29 to .23, although they remain smaller than the effects of a major reduction in opportunities to globalize the supply chain.

Robustness of the main claims

How robust are the main claims presented in Table 4 to alternative measures and model specifications? Note that the first main robustness check is reported in Table 4 itself. The main findings which used logged total trade flows are replicated using these flows as a percentage of industry sales (and then ranked across agreement-industries to deal with skewness). A series of additional robustness checks of the main results are presented in Table 7.

Columns 1 and 2 consider the same model specifications from Table 4, however all variables are based on the years 2010 to 2014 rather than 2005 to 2009. (Column 1 uses the logged trade flows variables and column 2 the ranked %-age sales versions.) The main results described above are extremely similar, especially for the variables describing opportunities to globalize the supply chain. An alternative set of specifications using trade flows two-years prior to, and two years after, agreement implementation show substantively identical results. These are provided in Appendix A. These checks show that the main findings here are not driven by idiosyncratic features of trade over the period 2005-2009, but rather stable features of global trade relationships.

Column 3 in Table 7 considers an alternative proxy for US multinationalization constructed using data on US direct investment abroad (the variable is called DIA and is described in appendix B). Recall that related party imports do not perfectly track imports from US multinationals because they might include imports by foreign multinationals invested in the US. The measure is also highly correlated with non-related party imports. Using the direct investment abroad measure suggests very similar effects of opportunities to multinationalize production on support for trade agreements. It does not appear that the sources of measurement error in the Related party imports variable unduly influencing the findings.

Columns 4 and 5 consider only industries that produce manufactures, excluding agricultural and mining industries that might have very different patterns of public positiontaking because of systematic differences in industrial structure. Column 5 also considers an additional set of control variables that are only available for manufacturing industries (especially the industrial concentration measures) which the literature has found are related to lobbying on trade policy. These include: the number of firms in the industry; the number of associations in a given industry and the total budgets of those associations, where available, taken from the Encyclopedia of Associations; the 4-firm and 20-firm concentration ratios from the US Economic Census; and the percent-

Table 7: Robustness of models from Table 4.

	Number of Supporting Firms					Association Support				
	1	2	3	4	5	1	2	3	4	5
Related-party and intermediates trade:										
Rel. party imports	0.38***	0.13		0.48***	0.43***	0.05**	0.00		0.12***	0.08***
DIA			0.48***					0.08***		
Inputs	0.88***	0.80***	0.69***	1.04***	1.04***	0.13***	0.11***	0.11***	0.11***	0.16***
Downs. exports	0.12***	0.20***	0.12***	0.19***	0.19***	0.00	0.01	0.00	−0.01	0.00
Ordinary trade:										
Imports × Homog.	−0.04	0.06	0.09	−1.50***	−1.32***	−0.08	−0.01	−0.14***	−0.05	−0.18***
Imports × Diff.	0.29*	0.08	0.37**	0.07	0.09	0.08**	0.11**	0.15***	0.07**	0.08**
Exports × Homog.	0.25***	0.67***	0.18**	0.92***	0.80***	0.08***	0.25***	0.14***	0.11*	0.08***
Exports × Diff.	0.03	0.79***	0.01	−0.02	−0.03	−0.01	0.05**	−0.04***	−0.04***	−0.04***
Other controls:										
Sales	0.18***	0.55***	0.22***	0.15***	0.19***	0.03**	0.09***	0.03**	0.03***	−0.03***
Homog. → Mod.	0.03	0.06	0.06	−0.18	−0.05	−0.07	−0.07	−0.04	0.07	−0.08
Homog. → Diff.	0.37*	0.36**	0.50**	0.13	0.28	−0.17	−0.16**	−0.14	−0.01	−0.08
Num. firms					−0.04					
Assocs. budget										0.04***
Num. assocs.										0.19***
4-firm conc.					−0.16*					0.05*
20-firm conc.					0.32**					0.00
Pct. HIIT					0.02					0.00
Pct. VIIT					0.15**					0.01
Pseudo-R^2	0.31	0.31	0.32	0.29	0.30	0.12	0.12	0.12	0.12	0.21
Sample	4030	4030	4030	3420	3370	4030	4030	4030	3420	3370

Notes: All estimates are first differences; changes in continuous variables are from 25th to 75th percentile. Median expected number of firms supporting is 1.13; median expected probability of association support is .29. Standard errors are clustered at 3-digit NAICS-agreement level. $^{***}p < 0.01, ^{**}p < 0.05, ^{*}p < 0.10$.

age of industry trade represented by horizontal and vertical intra-industry trade [see Fontagné and Freudenberg (1997)]. The main findings are entirely robust to these additional controls. The impact of vertical (that is, price-driven) intra-industry trade, an indicator of potential gains from multinationalization in North-South agreements, is strongly associated with firm support for trade agreements as shown by Manger (2012). On the associations side, industry organization strongly correlates with positiontaking but does not alter the main results.

If multinationalization of sourcing and production is so important for public positiontaking, a natural question is whether these forces also drive formal lobbying by firms and associations. This question is examined in the Appendix A using analagous outcomes (i.e. the number of firms that lobbied and a dummy variable for whether an association lobbied.) I find that the main results of this paper carry over to the case of formal lobbying. Related-party imports, Inputs, and Downstream exports are positively associated with firm lobbying on US trade agreements.

Conclusion: The Changed Nature of the Pro-Trade Coalition

Opportunities to source intermediates and multinationalize production are the most important drivers of industrial preferences over trade agreements. Import competition and export opportunities, whether direct or indirect, play important but secondary roles. What impact has this elevation of the global supply chain as the main motive of support for globalization had on American trade politics? Rather than focus on the role of intermediates and FDI as drivers of the formation of trade agreements or in stabilizing a liberal international order, points that are well covered in the literature discussed above, I instead focus on an intermediate outcome: the changing size and shape of the pro-trade coalition in the United States. Each of the three consequences for the nature of America's pro-trade coalition described below have the effect of pushing US trade policy toward greater openness and so are proximate explanations for the broader trade policy outcomes emphasized in the extant literature.

Growth of multinational supply chains has created *more support* for trade liberalization than would otherwise exist. The growth of intermediates sourcing from abroad has made US tradeables producers into consumers, too. But unlike the ordinary American consumer, who also benefits from trade, these firms and their associations are politically organized and highly influential (Gilens and Page, 2014). They publicly support trade, they form coalitions to push their pro-trade agenda, and they lobby members of Congress to pass agreements. The growth in multinationalization of production has had a similar effect, creating new opportunities for American business which expand the weight of interest groups pushing for free trade. And while the growth of multinationals must also create new opposition to trade among uncompetitive US firms producing in the US, the political advantage lies with pro-trade MNCs owing to their size and political resources.

Global supply chains have also changed the nature of US trade politics by *creating support for trade in uncompetitive industries*. In the Ricardo-Viner model of trade preferences commonly used to describe early post-war American trade politics, comparative advantage industries benefit from trade while comparative disadvantage industries are harmed by it. We therefore do not expect to see support for trade liberalization in industries at a comparative disadvantage. Do opportunities to source abroad fundamentally change this dynamic? This amounts to a question of whether there are differential effects of opportunities for FDI and importing intermediates across the competitiveness spectrum. If these opportunities increase support for liberalization in net-exporting industries only, we might say that the intensity of support for trade has changed but not its nature.

To examine this question, I replicate the main models from Table 4 by dividing up industries according to their tercile in the distribution of the export-import ratio.[24] These tests show that the nature of trade politics has indeed changed. Related party imports and intermediate inputs are associated with big increases in support for liberalization in uncompetitive industries as well competitive or neutral industries. So even as these forces have super-charged support for trade in net-exporting industries, they have undermined opposition to trade in net-importing industries by creating a vocal constituency in favor of liberalization. This is true among both firms and trade associations. For example, increasing inputs from their 25th to their 75th percentile is predicted to increase the probability an association supports an agreement by .18 to .40 in a typical net-importing industry. This undermining of opposition is also abetted by the rise of product variety, which turns the largest firms in relatively uncompetitive industries into supporters of trade liberalization, perfectly able to find a home for their varieties in export markets. These forces combine to sharply undermine efforts to oppose liberalization in net-importing industries.

Finally, the rise of global supply chains has changed the focus of trade politicking *from associations to firms*. In earlier eras of American trade politics, industries were represented politically by their associations. In the present era, firms are just as likely to strike out on their own. Foreign direct investment is a natural explanation for such a pattern, but so is product differentiation which turns the largest firms into trade winners even in uncompetitive industries. Sourcing intermediates can have similar effects if those inputs are relationship-specific, and only the largest firms are able to contract directly with foreign input suppliers. Each of these forces has the same outcome: only a subset of firms in any given industry can benefit from these opportunities. While one consequence of this is that industries might see internal divisions, another is that the largest firms see highly concentrated gains from trade liberalization. And those outsized gains also coincide with financial resources for lobbying efforts, experience in dealing with politicians, and any other political advantage associated with scale. These large US firms, many of them multinationals, stand as the vanguard of the pro-trade coalition in the United States. And they have succeeded in their aim of

[24] These models are presented in Appendix A.

knitting the US economy ever more tightly into the global marketplace.

Moving beyond preferences and organization to outcomes, it is possible to connect these new forces with the changed scope and content of the global trade agenda. Growth in globalization of the supply chain ought to lead to deeper trade liberalization, as the stakes are raised for trade liberalization and the size and resources of the pro-trade coalition expands. The proliferation of preferential trade agreements testifies to this trend, even if the Doha Round of WTO talks has run aground, due mainly to the agricultural sector (and its thin supply chains and limited multinationalization). Globalization of the supply chain also ought to reinforce itself through the expanded breadth of preferential trade agreements. Investment chapters and dispute settlement provisions are a natural site for multinationals to press for further institutional development. Firms sourcing offshore and multinationals alike will demand measures to facilitate trade, through the reduction of customs barriers; the harmonization of corporate, environmental, SPS, and labor regulation; and increases in regulatory and customs transparency. These expanded trade agenda items move well beyond the market access issues of yesterday (reductions in tariffs and NTBs) and even of today (TBTs, e-commerce, trade in services). Buckley (2009)'s "global factories" thrive where trade flows freely in all directions, and where regulation is harmonized to create a globalized common market. Whether these actors can see this agenda through given renewed strains on globalization – inequality, technological change, growing multipolarity – remains to be seen.

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SUPPORTING INFORMATION

The following additional materials are available in the online appendices:
Appendix A: Additional Models.
Appendix B: Cases and Data.

FOR ONLINE PUBLICATION ONLY

Appendix A: Additional Models

Extending the Approach to Lobbying

The results presented above show that the globalization of both sales and supply is the primary determinant of public position taking by firms and trade associations on US free trade agreements. If that is the case, then it stands to reason that formal lobbying of the Congress and Executive agencies ought to be similarly driven by these forces. Holding ordinary trade competition constant, for example, we ought to see greater lobbying where opportunities to multinationalize production are present. Likewise, incentives to lobby to privately express support or influence the terms or implementation of an agreement might be greater where intermediate inputs coming from the agreement are significant or the chances to export via downstream proxies are large.

The results of the lobbying models presented in Table A2 support each of these contentions, particularly among firms. To interpret these results, first note that the median number of firms expected to lobby per industry-agreement is .55. (NAFTA is excluded from this analysis because it preceded the Lobbying Disclosure Act.) Increasing related party imports from their 25th to their 75th percentile increases the expected number of firms lobbying on an agreement by .10, while increasing inputs sourced from that country increases expected firm support by .34 firms. Downstream exports are also positively associated with increases in firm lobbying.

The links between association lobbying and globalizing the supply chain are weaker overall: only sourcing intermediates is significantly associated with lobbying. These results are consistent with our findings on public positiontaking and may again reflect conflicts within industries given that opportunities to multinationalize production are generally restricted to a minority of firms.

Not all firms which lobby are necessarily supporters of trade agreements, so an immediate question is whether these results hold among lobbying firms and associations that were publicly identified as supporters of these agreements. The final two columns of Table A2 show that they mainly do, with the exception of downstream exports for firms. (These results use the logged total versions of explanatory variables.) Note that an average of .23 supporting firms lobby for each industry for a given agreement. Finally, Table A3 in the Online Appendix recreates the main robustness checks presented for position taking in Table 7 but using the lobbying based outcomes (among all firms and associations). As with the position-taking outcomes, I find that the main patterns established are robust to alternative measures and controls, and among the subsample of manufacturing industries only.

These results on lobbying corroborate the findings above on positiontaking but on a separate independent variable that represents another key facet of trade politics. Opportunities to source intermediate inputs from trade agreement partners are strongly associated with the decision by both firms and associations to lobby the US government on trade agreements. Related party imports and downstream exports are also linked to the decision to lobby, although mainly among firms. Given our results on positiontaking above, the most plausible interpretation of this is that greater existing and potential trade with agreement partners leads firms and associations to push the agreements with those partners in fora both public and private.

Table A1: Counts of US association and firm positions on 13 FTAs.

Lobbying Activity:							
		Firms			Associations		
Agreement	Year	Total	Support	No/Opp.	Total	Support	No/Opp.
NAFTA	1994	-	-	-	-	-	-
Jordan	2001	1	0	1	2	0	2
AUSFTA	2004	22	15	7	8	4	4
Chile	2004	7	7	0	1	0	1
Singapore	2004	7	4	3	2	0	2
CAFTA-DR	2005	67	22	45	26	15	11
Bah/Mor/Omn	2006	31	14	17	18	2	16
Peru	2007	58	12	46	28	15	13
Pan/Col	2011	132	56	76	59	40	19
KORUS	2011	150	63	87	74	59	15

Table A2: Predicted changes in lobbying among firms and associations on US trade agreements.

	ln variables		rank %-age vars.		supporters only	
Lobbying outcomes:	# Firms	Assoc.	# Firms	Assoc.	# Firms	Assoc.
Related-party and intermediates trade:						
Rel. party imports	0.10^{*}	0.02	0.05	0.01	0.06^{*}	0.02
Inputs	0.34^{***}	0.04^{***}	0.25^{***}	0.02^{*}	0.13^{***}	0.06^{***}
Downstream exports	0.05^{**}	0.01	0.07^{**}	0.00	0.00	0.00
Ordinary trade:						
Imports × Homog.	0.13	−0.06	0.12	−0.06	0.09	-0.10^{**}
Imports × Diff.	0.16	0.10^{**}	−0.02	0.08^{***}	0.04	0.11^{***}
Exports × Homog.	−0.02	0.02	0.13	0.09^{**}	0.04	0.03^{**}
Exports × Diff.	−0.04	-0.04^{***}	0.25^{***}	−0.01	−0.01	-0.04^{***}
Other controls:						
Sales	0.18^{***}	0.02^{**}	0.33^{***}	0.04^{***}	0.06^{***}	0.00
Homog. → Mod.	−0.05	−0.02	−0.02	−0.03	−0.06	0.00
Homog. → Diff.	0.17^{*}	−0.04	−0.04	−0.05	0.00	−0.01
Pseudo-R^2	0.13	0.04	0.13	0.03	0.08	0.05
Sample	3636	3636	3636	3636	3636	3636

Notes: All estimates are first differences; changes in continuous variables are from $25th$ to 75th percentile. Median expected number of firms lobbying is .55; median expected probability of association lobbying is .14. Standard errors are clustered at 3-digit NAICS-agreement level. $^{***}p < 0.01, ^{**}p < 0.05, ^{*}p < 0.10$.

Table A3: Robustness of models from Table A2.

	Number of Supporting Firms					Association Support				
	1	2	3	4	5	1	2	3	4	5
Related-party and intermediates trade:										
Rel. party imports	0.15**	0.09		0.10	0.08	0.02	0.00		0.03	0.02
DIA			0.02					−0.03***		
Inputs	0.37***	0.27***	0.34***	0.35***	0.32***	0.06***	0.03**	0.05***	0.03**	0.04***
Downs. exports	0.04**	0.06*	0.06**	0.08**	0.09***	0.00	0.00	0.01*	0.01	0.00
Ordinary trade:										
Imports × Homog.	0.03	0.05	0.20*	−0.87	−0.43	−0.04	−0.02	−0.03	0.12**	0.04
Imports × Diff.	0.05	0.00	0.28**	0.23*	0.31**	0.08**	0.09***	0.13***	0.11**	0.08**
Exports × Homog.	0.01	0.24**	−0.02	0.01	0.00	0.00	0.07**	0.01	−0.07**	−0.05***
Exports × Diff.	0.00	0.28***	−0.05	−0.05	−0.08**	−0.03***	−0.01	−0.04***	−0.04***	−0.03***
Other controls:										
Sales	0.14***	0.31***	0.18***	0.19***	0.21***	0.01	0.04***	0.02**	0.01	−0.01**
Homog. → Mod.	−0.06	−0.06	−0.05	−0.26	−0.05	−0.02	−0.03	−0.02	0.06	0.02
Homog. → Diff.	0.15	0.15	0.18*	−0.05	0.16	−0.04	−0.05	−0.04	0.03	0.04
Num. firms					−0.05					
Assocs. budget										0.00
Num. assocs.										0.13***
4-firm conc.					−0.31***					−0.03**
20-firm conc.					0.63***					0.05**
Pct. HIIT					−0.02***					0.00
Pct. VIIT					0.14**					0.04**
Pseudo-R^2	0.14	0.14	0.13	0.11	0.015	0.04	0.04	0.04	0.04	0.12
Sample	3636	3636	3636	3087	3042	3636	3636	3636	3087	3042

Notes: All estimates are first differences; changes in continuous variables are from 25th to 75th percentile. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.10$.

Bootstrapped standard errors

One of the questions raised in the main text concerns multi-product firms (and associations). A single expression of support by one firm or association can lead to multiple 6-digit NAICS industries having an extra firm or association support the agreement. Naturally, then, there is dependence among the units analyzed, violating the usual assumption of independent observations. The solution pursued in the main text – to cluster standard errors at the 3-digit NAICS-agreement level – ameliorates some of this problem but imperfectly, because most firms don't span an entire 3-digit NAICS code.

As an alternative, I explored using a two-stage bootstrap procedure. In the first stage, I resample from the set of all supporting firms and associations for each agreement. For example, I randomly sample (with replacement) 177 firms from the 177 total firms that supported the KORUS agreement. This bootstrap sample of supporting firms is then mapped into the outcome variable # Firms in the expected way. In total, I created 5000 bootstrap samples of the firm and association outcomes variables which are used to resolve the issues associated with multi-product firms and associations. The extra variance that is likely to be generated by multi-product firms is then incorporated into the estimation.

The second stage of the procedure then does an ordinary bootstrap over all of the observations (including the outcome variables). Because I have 5000 bootstrapped outcome variables, I do the same number of bootstrap samples for the complete data. The estimates from these models are then presented in Table A4 which examines only the total versions of the explanatory variables not the rank %-age versions. These models are presented simply as regression coefficients, because the focus here is on evaluating the relative difference in the standard errors. (Note that due to sampling variability there are slight differences in the coefficient estimates.) Models 1 and 3 represent the OLS estimates of the standard errors; models 2 and 4 are my bootstrapped standard errors.

Examining the differences between the two, it is evident that the boostrapped standard errors are not significantly different from the OLS standard errors. In general, it appears that any additional variance created by multi-product firms is not sufficient to grossly alter the uncertainty around the coefficient estimates for the model. I infer from this that simulated first differences in the main text will not be significantly different either. I therefore retain the clustered standard errors in the main text.

Table A4: Robustness of model 1 from Table 4.

	# Firms		Assoc. support	
	1	2	3	4
Related-party and intermediates trade:				
Rel. party imports	0.023	0.021	0.892	0.875
	0.003***	0.003***	0.186***	0.177***
Inputs (rel. party)	0.090	0.091	3.256	3.351
	0.004***	0.005***	0.307***	0.275***
Outputs	0.011	0.010	0.108	0.137
	0.002***	0.003***	0.157	0.152
Ordinary trade:				
Imports (non. rel. party)	−0.211	−0.209	−4.105	−4.935
	0.068***	0.058***	4.739	4.009
Exports	−0.021	−0.020	2.432	2.367
	0.068	0.063	4.676	4.146
Imports × Mod. diff.	−0.001	0.000	1.851	1.725
	0.006	0.007	0.444***	0.435***
Imports × Diff.	0.006	0.006	1.893	1.872
	0.006	0.006	0.419***	0.399***
Exports × Mod. diff.	0.012	0.010	−1.633	−1.525
	0.007*	0.007	0.478***	0.445***
Exports × Diff.	0.002	0.001	−2.864	−2.846
	0.007	0.007	0.458***	0.428***
Other controls:				
Sales	−0.006	−0.006	−1.478	−1.471
	0.005	0.006	0.375***	0.375***
Mod. diff	0.001	0.003	2.051	2.040
	0.006	0.005	0.385***	0.363***
Diff.	0.066	0.064	1.673	1.550
	0.010***	0.011***	0.682**	0.694**
Intercept	−2.374	−2.312	−57.778	−56.490
	0.205***	0.228***	14.196***	14.255***

Notes: $^{***}p < 0.01, ^{**}p < 0.05, ^{*}p < 0.10$.

Alternative model specifications

This section considers a series of alternative specifications of the main model in order to explore whether the main results are owing to a misspecification of the main model. Recall that the main results in the paper use trade values averaged over the years 2005 to 2009 for all of the main trade flow variables. Such an approach has several merits and several flaws. On the positive side, all of the variables are measured over the time span (the related-party imports data starts in 2002 and ends in 2014). Using a five-year period also permits smoothing over year-to-year variation in annual US-partner country trade flows, which can vary significantly from year to year. This also ensures comparability on the measure from the perspective of the independent variables. For example, if trade falls across the board in 2009, we won't be mistakenly attributing outsized support for the Peru trade agreement to that fact.

Table A5: Replication of model 4 with all trade flows measured two years after agreement implementation.

	ln variables		rank %-age vars.	
Outcome:	# Firms	Assoc.	# Firms	Assoc.
Related-party and intermediates trade:				
Rel. party imports	0.31^{***}	0.09^{***}	0.54^{***}	0.11^{***}
Inputs	0.55^{***}	0.12^{***}	1.48^{***}	0.22^{***}
Downstream exports	0.03	0.00	-0.16^{**}	-0.02
Ordinary trade:				
Imports × Homog.	0.07	-0.17^{***}	0.06	-0.10^{**}
Imports × Diff.	0.20^{*}	0.06^{**}	0.42^{***}	0.08^{**}
Exports × Homog.	0.28^{***}	0.15^{***}	0.56^{***}	0.26^{***}
Exports × Diff.	-0.21^{***}	-0.04^{***}	-0.76^{***}	-0.11^{***}
Other controls:				
Sales	0.27^{***}	0.02^{**}	1.19^{***}	0.20^{***}
Homog. → Mod.	-0.05	-0.05	0.02	-0.04
Homog. → Diff.	0.21	-0.15	0.42	-0.12
Pseudo-R^2	0.15	0.11	0.12	0.07
Sample	3627	3627	3627	3627

Notes: All estimates are first differences; changes in continuous variables are from $25th$ to 75th percentile. Median expected number of firms supporting is 1.13; median expected probability of association support is .29. Standard errors are clustered at 3-digit NAICS-agreement level. $^{***}p < 0.01, ^{**}p < 0.05, ^{*}p < 0.10$.

Of course, this comparability comes at a cost from the perspective of the dependent variables. For example, a reader of this paper noted that the temporal disjuncture between support for NAFTA in 1994 and the trade patterns that characterize the NAFTA countries from 2005-2009 may be too great, suppressing the impact of trade flows on public support because a lot can change over ten-plus years. Moreover, some of the agreements are implemented before 2005-09 and others afterwards.

To respond to these concerns, I have done three empirical things. First, note that the main text included a robustness check showing that the main results from Table 4 (which uses data from 2005-09) are replicated using data from 2010-14. This only partly addresses the implementation question because all of these agreements were implemented by 2012. Second, to address the remaining questions, Table A5 employs new versions of the main independent variables, all measured two years after implementation of the agreement.[25] Note that doing so requires removing NAFTA from the data analysis, and so the predicted effects are smaller, in general, because firm support for NAFTA was so significant. This reduces the sample size by 403 industries. The model is otherwise identical to Table 4 in the main text. Note that the direction and significance of the estimated effects are all very similar to 4. This suggests that the choice of trade patterns in 2005-09 is not unduly influencing the results. A complementary set of results is presented Table A6 which uses trade flows two years before the agreements were concluded.

As a final test, I have also reestimated the main models by excluding the NAFTA agreement (which is the

[25] Note that the Middle East agreements have two agreements implemented in 2006 and one in 2009. I adopt 2006 as the year of implementation.

Table A6: Replication of model 4 with all trade flows measured two years prior to implementation.

	ln variables		rank %-age vars.	
Outcome:	# Firms	Assoc.	# Firms	Assoc.
Related-party and intermediates trade:				
Rel. party imports	0.34^{***}	0.13^{***}	0.48^{***}	0.14^{***}
Inputs	0.25^{***}	0.06^{***}	0.07	−0.03
Downstream exports	0.10^{**}	0.01	0.29^{**}	0.05^{**}
Ordinary trade:				
Imports × Homog.	0.04	-0.21^{***}	0.09	−0.09
Imports × Diff.	0.16	0.02	0.30^{**}	0.01
Exports × Homog.	0.20^{**}	0.08^{***}	0.44^{**}	0.15^{**}
Exports × Diff.	0.01	-0.02^{*}	−0.14	−0.03
Other controls:				
Sales	0.39^{***}	0.04^{***}	0.84^{***}	0.10^{***}
Homog. → Mod.	−0.03	−0.05	0.00	−0.06
Homog. → Diff.	0.40^{**}	−0.14	0.54	-0.13^{*}
Pseudo-R^2	0.15	0.11	0.12	0.07
Sample	3324	3224	3224	3224

Notes: All estimates are first differences; changes in continuous variables are from $25th$ to 75th percentile. Median expected number of firms supporting is 1.13; median expected probability of association support is .29. Standard errors are clustered at 3-digit NAICS-agreement level. $^{***}p < 0.01, ^{**}p < 0.05, ^{*}p < 0.10$.

most distant in time from 2005-09), and by excluding all of the agreements which entered into force before 2005. These results are presented in Table A7. Columns 1 and 4 present the underlying regression models from Table 4's columns 1 and 2. Columns 3 and 5 replicate the models among non-NAFTA observations; columns 4 and 6 present reestimate the models among agreements that entered into force in 2005 or after only. There are two main results here. First, the model fitting is not strongly driven by the NAFTA resultsin one direction or another. This is perhaps not surprising because NAFTA is only 1/10th of the data, however this is still reassuring for the question of the fit between predictors and the outcomes. Second, the results with only 6 of the agreement clusters are substantively very similar. The effects of Related party imports and Downstream outputs are a little stronger and of imported inputs are weaker, but overall the main patterns uncovered still hold.

Table A7: Robustness of model 2 from Table 4.

	# firms			Assoc. support		
	1	2	3	4	5	6
Related-party and intermediates trade:						
Rel. party imports	0.030	0.032	0.039	0.037	0.044	0.059
	0.010***	0.010***	0.012***	0.014***	0.014***	0.017***
Inputs (rel. party)	0.229	0.180	0.073	0.186	0.194	0.111
	0.026***	0.027***	0.038*	0.030***	0.037***	0.063*
Outputs	0.025	0.014	0.016	0.005	−0.004	0.005
	0.008***	0.010	0.011	0.014	0.015	0.019
Ordinary trade:						
Imports (non. rel. party)	0.063	−0.088	0.089	−0.122	−0.259	−0.186
	0.217	0.250	0.292	0.367	0.392	0.414
Exports	0.855	0.863	1.105	0.220	0.036	0.206
	0.280***	0.320***	0.384***	0.438	0.475	0.534
Imports × Mod. diff.	0.016	0.005	−0.001	0.091	0.102	0.084
	0.016	0.017	0.020	0.025***	0.028***	0.031***
Imports × Diff.	0.012	0.006	0.006	0.106	0.122	0.157
	0.019	0.019	0.021	0.029***	0.030***	0.038***
Exports × Mod. diff.	−0.014	−0.002	−0.003	−0.084	−0.075	−0.074
	0.017	0.018	0.020	0.027***	0.029**	0.032**
Exports × Diff.	−0.045	−0.046	−0.054	−0.156	−0.149	−0.197
	0.025*	0.027*	0.031*	0.033***	0.036***	0.042***
Other controls:						
Sales	−0.008	0.001	0.002	−0.072	−0.084	−0.098
	0.014	0.014	0.015	0.026***	0.028***	0.033***
Mod. diff	0.040	0.042	0.040	0.106	0.104	0.117
	0.016**	0.017**	0.020**	0.026***	0.029***	0.034***
Diff.	0.132	0.180	0.270	0.080	0.067	0.187
	0.044***	0.055***	0.067***	0.066	0.073	0.100*
Intercept	−7.265	−7.623	−8.243	−5.632	−5.283	−6.893
	0.890***	1.091***	1.299***	1.396***	1.496***	1.744***
N	4030	3627	2418	4030	3627	2418

Notes: $^{***}p < 0.01, ^{**}p < 0.05, ^{*}p < 0.10$.

Subset analysis

Table A8: Predicted changes from Table 4 conditional on comparative advantage.

Sample:	Net-importing	Balanced	Net-exporting
Change in firm support, logged totals:			
Rel. party imports	0.27^{***}	0.28^{***}	0.72^{***}
Inputs	0.95^{***}	0.47^{***}	1.01^{***}
Downstream exports	0.12^{**}	-0.06^{**}	0.33^{***}
Change in assoc. support, logged totals:			
Rel. party imports	0.08^{**}	0.08^{***}	0.06^{**}
Inputs	0.21^{***}	0.08^{***}	0.06^{**}
Downstream exports	-0.02^{*}	0.01	0.02^{*}
Change in firm support, %-age sales:			
Rel. party imports	0.33^{***}	0.25^{***}	1.19^{***}
Inputs	1.09^{***}	0.47^{***}	0.68^{***}
Downstream exports	0.15^{**}	-0.07^{*}	0.70^{***}
Change in assoc. support, %-age sales:			
Rel. party imports	0.10^{***}	0.08^{***}	0.09^{***}
Inputs	0.21^{***}	0.07^{***}	0.04
Downstream exports	−0.03	0.01	0.03
Sample	1343	1343	1344

Notes: All estimates are first differences; changes in continuous variables are from $25th$ to 75th percentile. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.10$.

Random and fixed effects models

As a final set of checks, this paper examines a series of models with random intercepts and fixed effects. Random effects models introduce bias into coefficient estimates if covariates are correlated with the cluster intercepts but generally produce less variable estimates than fixed effects models. Rather than make examine one side of this tradeoff, this paper considers both types of models across four potential groupings where separate intercepts might enter the regression function – agreements; industries; 3-digit NAICS industries for each agreement; and, both agreements and industries at the same time. I focus on the globalizing the supply chain variables and the downstream output variables to streamline the discussion.

Two observations are critical. First, and as expected, the impact of related party imports, intermediate inputs, and downstream exports are all attenuated by the introduction of either random or fixed effects. Different agreements and different industries differ in their fixed characteristics, and these fixed characteristics, whatever they may be, are driving some of the position-taking. This does not mean that these differences are not themselves a consequence of our preferred explanatory factors – there were more opportunities for multinationalization and inputs sourcing for all industries across NAFTA than the Jordan FTA, for example. We cannot be certain what drives these idiosyncratic agreement- or industry-specific factors.

Second, and reassuringly, the direction and statistical significance of the main findings in this paper are generally robust to the inclusion of random and fixed effects. This is particularly so in the case of the firm support outcomes, but is also true of the expected signs of the variables in the association support models. Sign changes are very rare, and where they crop up are never statistically significant except in two cases

involving association support.

Table A9: Robustness of model 1 from Table 4.

DV: # Firms	1	2	3	4	5
Related-party and intermediates trade:					
Rel. party imports	0.030	0.026	0.013	0.007	0.000
	0.006***	0.007***	0.006**	0.006	0.005
Inputs (rel. party)	0.229	0.013	0.044	0.235	0.073
	0.011***	0.021	0.018**	0.012***	0.017***
Outputs	0.025	0.015	0.022	0.106	0.045
	0.005***	0.005***	0.004***	0.010***	0.009***
Ordinary trade:					
Imports (non. rel. party)	−0.008	−0.003	−0.017	−0.001	−0.005
	0.014	0.015	0.013	0.014	0.013
Exports	0.040	0.032	0.035	0.028	0.004
	0.016**	0.017*	0.014**	0.020	0.018
Imports × Mod. diff.	0.016	0.008	0.034	0.011	0.009
	0.016	0.017	0.015**	0.017	0.015
Imports × Diff.	0.012	−0.003	0.021	−0.006	−0.005
	0.015	0.016	0.014	0.015	0.014
Exports × Mod. diff.	−0.014	−0.008	−0.044	0.042	0.039
	0.020	0.020	0.017***	0.025*	0.022*
Exports × Diff.	−0.045	−0.028	−0.036	0.050	0.041
	0.018**	0.019	0.016**	0.023**	0.021**
Other controls:					
Sales	0.132	0.382	0.260	0.146	0.389
	0.024***	0.031***	0.025***	0.051***	0.045***
Mod. diff	0.063	0.133	0.072	−0.496	−0.435
	0.220	0.230	0.195	0.341	0.292
Diff.	0.855	1.024	0.371	0.052	0.265
	0.211***	0.222***	0.191*	0.326	0.280
Intercept	−7.265	−10.085	−7.675	−9.110	−11.366
	0.522***	0.660***	0.475***	1.152***	0.992***
Agreement RE	No	Yes	No	No	Yes
Agreement-NAICS3 RE	No	No	Yes	No	No
6-digit NAICS RE	No	No	No	Yes	Yes
N	4040	4040	4040	3730	3730
R^2	0.33	0.40	0.62	0.63	0.69

Notes: $^{***}p < 0.01, ^{**}p < 0.05, ^{*}p < 0.10$.

Table A10: Robustness of model 2 from Table 4.

DV: Assoc. support	1	2	3	4	5
Related-party and intermediates trade:					
Rel. party imports	0.028	0.031	0.018	0.017	0.019
	0.010***	0.011***	0.013	0.014	0.016
Inputs (rel. party)	0.197	−0.004	0.123	0.348	0.128
	0.018***	0.031	0.042***	0.030***	0.051**
Outputs	0.002	−0.003	0.024	0.087	0.060
	0.008	0.008	0.012**	0.027***	0.032*
Ordinary trade:					
Imports (non. rel. party)	−0.053	−0.058	−0.045	0.010	0.013
	0.019***	0.020***	0.027	0.030	0.032
Exports	0.106	0.107	0.140	0.191	0.155
	0.023***	0.023***	0.030***	0.045***	0.048***
Imports × Mod. diff.	0.080	0.074	0.052	0.053	0.041
	0.023***	0.024***	0.032	0.036	0.039
Imports × Diff.	0.091	0.070	0.046	0.093	0.065
	0.023***	0.023***	0.032	0.036**	0.040*
Exports × Mod. diff.	−0.086	−0.086	−0.122	−0.133	−0.119
	0.028***	0.028***	0.035***	0.055**	0.060**
Exports × Diff.	−0.152	−0.136	−0.170	−0.245	−0.194
	0.027***	0.028***	0.036***	0.055***	0.060***
Other controls:					
Sales	0.077	0.310	0.362	0.089	0.423
	0.036**	0.047***	0.061***	0.121	0.147***
Mod. diff	0.079	0.189	0.899	0.254	0.254
	0.304	0.310	0.364**	0.797	0.876
Diff.	0.395	0.576	1.079	0.511	0.228
	0.297	0.305*	0.380***	0.779	0.858
Intercept	−5.892	−8.547	−13.010	−11.020	−15.187
	0.788***	0.908***	1.162***	2.734***	3.164***
Agreement RE	No	Yes	No	No	Yes
Agreement-NAICS3 RE	No	No	Yes	No	No
6-digit NAICS RE	No	No	No	Yes	Yes
N	4040	4040	4040	3730	3730
R^2	0.13	0.17	0.45	0.44	0.51

Notes: $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.10$.

Table A11

Table A12: Robustness of model 3 from Table 4.

DV: # Firms	1	2	3	4	5
Related-party and intermediates trade:					
Rel. party imports	0.108	0.130	0.051	−0.006	0.005
	0.045**	0.049***	0.038	0.042	0.037
Inputs (rel. party)	0.393	0.016	0.064	0.328	0.103
	0.025***	0.038	0.033*	0.025***	0.029***
Outputs	0.095	−0.006	0.079	0.373	0.094
	0.022***	0.023	0.019***	0.033***	0.031***
Ordinary trade:					
Imports (non. rel. party)	0.011	−0.011	−0.058	0.067	−0.021
	0.081	0.087	0.077	0.084	0.074
Exports	0.317	0.204	0.242	0.168	0.020
	0.077***	0.081**	0.072***	0.083**	0.073
Imports × Mod. diff.	0.059	0.035	0.120	0.064	0.060
	0.094	0.099	0.085	0.096	0.084
Imports × Diff.	−0.130	−0.170	−0.005	−0.162	−0.099
	0.085	0.091*	0.081	0.088*	0.078
Exports × Mod. diff.	−0.080	−0.041	−0.191	0.188	0.156
	0.095	0.100	0.085**	0.101*	0.089*
Exports × Diff.	−0.002	0.048	−0.106	0.424	0.301
	0.087	0.092	0.080	0.094***	0.083***
Other controls:					
Sales	0.426	0.438	0.348	0.554	0.535
	0.022***	0.022***	0.018***	0.049***	0.040***
Mod. diff	0.093	0.124	0.030	−0.425	−0.328
	0.206	0.216	0.192	0.286	0.242
Diff.	0.627	0.820	0.392	−0.015	0.229
	0.195***	0.206***	0.191**	0.266	0.227
Intercept	−11.628	−11.072	−9.205	−15.135	−13.431
	0.528***	0.637***	0.464***	1.122***	0.963***
Agreement RE	No	Yes	No	No	Yes
Agreement-NAICS3 RE	No	No	Yes	No	No
6-digit NAICS RE	No	No	No	Yes	Yes
N	4040	4040	4040	3730	3730
R^2	0.27	0.36	0.60	0.62	0.69

Notes: $^{***}p < 0.01, ^{**}p < 0.05, ^{*}p < 0.10$.

Table A13: Robustness of model 4 from Table 4.

DV: Assoc. support	1	2	3	4	5
Related-party and intermediates trade:					
Rel. party imports	0.090	0.141	0.001	−0.016	0.053
	0.069	0.074*	0.092	0.100	0.109
Inputs (rel. party)	0.335	−0.059	0.163	0.580	0.153
	0.039***	0.056	0.082**	0.065***	0.090*
Outputs	−0.017	−0.085	0.126	0.322	0.103
	0.035	0.037**	0.052**	0.090***	0.108
Ordinary trade:					
Imports (non. rel. party)	−0.267	−0.331	−0.140	0.147	0.059
	0.120**	0.124***	0.160	0.176	0.188
Exports	0.770	0.738	0.781	0.953	0.869
	0.115***	0.119***	0.155***	0.187***	0.203***
Imports × Mod. diff.	0.402	0.382	0.111	0.235	0.261
	0.135***	0.140***	0.179	0.203	0.218
Imports × Diff.	0.370	0.258	−0.020	0.358	0.297
	0.129***	0.134*	0.180	0.203*	0.220
Exports × Mod. diff.	−0.466	−0.484	−0.373	−0.526	−0.670
	0.140***	0.144***	0.184**	0.225**	0.243***
Exports × Diff.	−0.650	−0.587	−0.564	−0.673	−0.629
	0.133***	0.138***	0.182***	0.224***	0.245**
Other controls:					
Sales	0.321	0.341	0.552	0.575	0.704
	0.034***	0.035***	0.048***	0.122***	0.137***
Mod. diff	−0.110	0.016	0.494	−0.268	0.013
	0.282	0.290	0.357	0.701	0.764
Diff.	−0.143	0.131	0.678	−1.077	−0.985
	0.272	0.281	0.369*	0.664	0.727
Intercept	−9.461	−9.121	−15.820	−17.542	−19.317
	0.807***	0.882***	1.183***	2.796***	3.151***
Agreement RE	No	Yes	No	No	Yes
Agreement-NAICS3 RE	No	No	Yes	No	No
6-digit NAICS RE	No	No	No	Yes	Yes
N	4040	4040	4040	3730	3730
R^2	0.11	0.16	0.44	0.51	0.55

Notes: $^{***}p < 0.01, ^{**}p < 0.05, ^{*}p < 0.10$.

Table A14: Robustness of model 1 from Table 4.

DV: # Firms	1	2	3	4	5
Related-party and intermediates trade:					
Rel. party imports	0.023	0.015	0.008	0.005	0.001
	0.003***	0.003***	0.002***	0.002**	0.002
Inputs	0.089	0.012	−0.015	0.038	0.012
	0.004***	0.008	0.008*	0.005***	0.008
Outputs	0.011	0.006	0.011	0.143	0.050
	0.002***	0.002***	0.002***	0.008***	0.009***
Other controls:					
Imports (non. rel. party)	−0.006	−0.002	0.001	0.002	−0.002
	0.005	0.005	0.005	0.006	0.005
Exports	0.001	−0.002	0.006	−0.011	−0.027
	0.006	0.005	0.005	0.008	0.008***
Imports × Mod. diff.	−0.001	−0.003	−0.001	−0.004	−0.003
	0.006	0.006	0.005	0.007	0.006
Imports × Diff.	0.006	0.002	−0.001	−0.006	−0.001
	0.006	0.006	0.005	0.007	0.006
Exports × Mod. diff.	0.012	0.014	−0.006	0.032	0.024
	0.007*	0.006**	0.006	0.011***	0.010**
Exports × Diff.	0.002	0.008	−0.003	0.080	0.059
	0.007	0.006	0.006	0.011***	0.010***
Ordinary trade:					
Sales	0.068	0.160	0.135		
	0.010***	0.012***	0.012***		
Mod. diff	−0.209	−0.183	−0.047		
	0.068***	0.064***	0.056		
Diff.	−0.021	0.032	0.024		
	0.068	0.063	0.059		
Intercept	−2.404	−3.274	−2.686	−2.878	−0.394
	0.203***	0.200***	0.216***	0.190***	0.257
Agreement FE	No	Yes	No	No	Yes
Agreement-NAICS3 FE	No	No	Yes	No	No
6-digit NAICS FE	No	No	No	Yes	Yes
N	4040	4040	4040	3730	3730
R^2	0.33	0.40	0.62	0.63	0.69

Notes: $^{***}p < 0.01, ^{**}p < 0.05, ^{*}p < 0.10$.

Table A15: Robustness of model 2 from Table 4.

DV: Assoc. support	1	2	3	4	5
Related-party and intermediates trade:					
Rel. party imports	0.007	0.006	0.002	0.002	0.003
	0.002***	0.002***	0.002	0.002	0.002
Inputs (rel. party)	0.034	−0.005	−0.007	0.031	0.008
	0.003***	0.006	0.006	0.005***	0.007
Outputs	0.000	−0.001	0.003	0.044	0.028
	0.002	0.002	0.001*	0.008***	0.009***
Other controls:					
Imports (non. rel. party)	−0.011	−0.010	−0.004	0.002	0.002
	0.004***	0.004***	0.003	0.004	0.004
Exports	0.019	0.018	0.016	0.021	0.012
	0.004***	0.004***	0.003***	0.006***	0.005**
Imports × Mod. diff.	0.016	0.014	0.004	0.009	0.006
	0.004***	0.004***	0.004	0.005*	0.005
Imports × Diff.	0.016	0.011	0.002	0.011	0.005
	0.004***	0.004***	0.004	0.005**	0.005
Exports × Mod. diff.	−0.015	−0.014	−0.014	−0.009	−0.007
	0.005***	0.005***	0.004***	0.009	0.008
Exports × Diff.	−0.027	−0.022	−0.019	−0.010	−0.001
	0.005***	0.004***	0.004***	0.009	0.009
Ordinary trade:					
Sales	0.016	0.059	0.071		
	0.007**	0.008***	0.008***		
Mod. diff	−0.015	0.001	0.104		
	0.047	0.046	0.041**		
Diff.	0.044	0.071	0.120		
	0.047	0.045	0.043***		
Intercept	−0.600	−0.779	−1.318	−1.455	−0.439
	0.140***	0.143***	0.157***	0.165***	0.240*
Agreement FE	No	Yes	No	No	Yes
Agreement-NAICS3 FE	No	No	Yes	No	No
6-digit NAICS FE	No	No	No	Yes	Yes
N	4040	4040	4040	3730	3730
R^2	0.33	0.40	0.62	0.63	0.69

Notes: $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.10$.

Table A16: Robustness of model 3 from Table 4.

DV: # Firms	1	2	3	4	5
Related-party and intermediates trade:					
Rel. party imports	0.074	0.057	0.027	0.005	−0.005
	0.019***	0.018***	0.016*	0.018	0.016
Inputs (rel. party)	0.160	0.011	−0.010	0.099	0.029
	0.011***	0.014	0.016	0.012***	0.014**
Outputs	0.047	0.000	0.042	0.271	0.063
	0.010***	0.009	0.009***	0.020***	0.021***
Other controls:					
Imports (non. rel. party)	−0.004	−0.009	0.014	0.045	−0.006
	0.032	0.029	0.026	0.036	0.032
Exports	0.064	0.019	0.061	0.001	−0.089
	0.030**	0.027	0.025**	0.035	0.032***
Imports × Mod. diff.	0.005	−0.001	−0.011	−0.025	−0.015
	0.036	0.034	0.030	0.041	0.037
Imports × Diff.	−0.025	−0.045	−0.040	−0.059	−0.023
	0.034	0.032	0.030	0.039	0.035
Exports × Mod. diff.	0.059	0.064	−0.029	0.146	0.128
	0.037	0.034*	0.031	0.043***	0.039***
Exports × Diff.	0.107	0.133	0.017	0.290	0.247
	0.035***	0.032***	0.030	0.041***	0.037***
Ordinary trade:					
Sales	0.188	0.191	0.141		
	0.009***	0.008***	0.008***		
Mod. diff	−0.199	−0.162	−0.039		
	0.069***	0.064**	0.058		
Diff.	−0.125	−0.047	0.042		
	0.066*	0.061	0.060		
Intercept	−4.311	−3.805	−3.014	−0.800	0.478
	0.202***	0.193***	0.206***	0.169***	0.175***
Agreement FE	No	Yes	No	No	Yes
Agreement-NAICS3 FE	No	No	Yes	No	No
6-digit NAICS FE	No	No	No	Yes	Yes
N	4040	4040	4040	3730	3730
R^2	0.33	0.40	0.62	0.63	0.69

Notes: $^{***}p < 0.01, ^{**}p < 0.05, ^{*}p < 0.10$.

Table A17: Robustness of model 4 from Table 4.

DV: Assoc. support	1	2	3	4	5
Related-party and intermediates trade:					
Rel. party imports	0.023	0.029	0.002	0.005	0.016
	0.013*	0.013**	0.011	0.012	0.012
Inputs (rel. party)	0.063	−0.017	−0.009	0.051	0.014
	0.007***	0.010*	0.011	0.008***	0.010
Outputs	−0.002	−0.017	0.015	0.062	0.037
	0.007	0.007**	0.007**	0.014***	0.015**
Other controls:					
Imports (non. rel. party)	−0.055	−0.059	−0.013	0.027	0.009
	0.022**	0.021***	0.019	0.024	0.023
Exports	0.149	0.132	0.093	0.131	0.102
	0.020***	0.020***	0.018***	0.024***	0.023***
Imports × Mod. diff.	0.081	0.070	0.002	0.015	0.010
	0.025***	0.024***	0.022	0.028	0.027
Imports × Diff.	0.071	0.044	−0.017	0.004	−0.013
	0.024***	0.023*	0.021	0.026	0.026
Exports × Mod. diff.	−0.086	−0.081	−0.041	−0.075	−0.071
	0.026***	0.025***	0.022*	0.029**	0.028**
Exports × Diff.	−0.128	−0.104	−0.074	−0.088	−0.068
	0.024***	0.023***	0.022***	0.028***	0.027**
Ordinary trade:					
Sales	0.059	0.059	0.071		
	0.006***	0.006***	0.006***		
Mod. diff	−0.050	−0.022	0.062		
	0.048	0.046	0.042		
Diff.	−0.045	0.007	0.091		
	0.045	0.044	0.044**		
Intercept	−1.255	−0.801	−1.377	−0.489	−0.035
	0.140***	0.139***	0.149***	0.115***	0.127
Agreement FE	No	Yes	No	No	Yes
Agreement-NAICS3 FE	No	No	Yes	No	No
6-digit NAICS FE	No	No	No	Yes	Yes
N	4040	4040	4040	3730	3730
R^2	0.33	0.40	0.62	0.63	0.69

Notes: $^{***}p < 0.01, ^{**}p < 0.05, ^{*}p < 0.10$.

Appendix B: Cases and Data

Cases

This paper considers data from the following trade agreements and other reciprocal liberalization measures.

Australia-US Free Trade Agreement (AUSFTA)
Dominican Republic-Central America Free Trade Agreement (CAFTA-DR)
Chile Free Trade Agreement
Free Trade Agreement of the Americas (Failed)
Jordan Free Trade Agreement
Korea-US Free Trade Agreement (KORUS)
U.S.-Panama Trade Agreement and U.S.-Colombia Trade Agreement (Treated jointly)
Bahrain Free Trade Agreement; Morocco Free Trade Agreement; Oman Free Trade Agreement; United Arab Emirates-US Free Trade Agreement (Not ratified) (Treated jointly)
Peru-US Trade Promotion Agreement
Singapore-US Free Trade Agreement
Permanent Normal Trade Relations with China
Permanent Normal Trade Relations with Russia

Imputed positions

A small number of association positions are imputed, because the agreement explicitly excluded liberalization of a particular industry, whether their own or a supplying upstream industry. All of these cases are listed below, and the reasoning is mentioned, in brief. These cases are all associations, because they tend to occur in agricultural industries. "Oppose:ImputeFavor" implies that the association publicly opposed the agreement, but they are treated as likely supporter, should the agreement have included full liberalization.

Australia-US Free Trade Agreement (AUSFTA)
National Association of Wheat Growers; Oppose:ImputeFavor
U.S. Wheat Associates; Oppose:ImputeFavor
Wheat Export Trade Education Committee; Oppose:ImputeFavor
-Australia was permitted to maintain its Wheat Board, which certain agricultural groups contended would suppress competition in the Australian market.
American Sugar Alliance; Favor:ImputeOppose
Grocery Manufacturers Association; Oppose:ImputeFavor
-The US Sugar industry avoided substantive liberalization; "sugar was excluded from the agreement..."[26] The GMA opposed the agreement because sugar was excluded, and beef, to an extent. The agreement "...includes no increases for imports of Australian-grown sugar and only minimal increases for beef and dairy products."[27]

[26] USITC. "US-Australia Free Trade Agreement: Potential Economywide and Selected Sectoral Effects." pg. xv.
[27] Congressional Research Service. "Agriculture in the Australia-U.S. Free Trade Agreement". September 29

Korea-US Free Trade Agreement (KORUS)
USA Rice Federation; Oppose:ImputeFavor
US Rice Producers Association; Oppose:ImputeFavor
Rice Millers' Association; Oppose:ImputeFavor
-The rice producing associations opposed the agreement because rice was largely excluded from the agreement. E.g. "USA Rice does not support the agreement as it stands due to the exclusion of rice. Free trade agreements entered into by the US should be comprehensive and include all products even those that are politically sensistive."[28]

US-Peru Trade Promotion Agreement
Travel Goods Association; Oppose:ImputeFavor
-"The Travel Goods Association (TGA) does not support the U.S.-Peru TPA. TGA states that the TPA has highly restrictive provisions on textile travel goods that prevent U.S. travel goods companies from using the best available inputs."[29]

Additional explanatory variables

Proxies for FDI: As an alternative to the data on related-party imports as a proxy for vertical FDI, this paper also examines a measure constructed using data on US direct investment abroad (DIA) provided by the Bureau of Economic Analysis. The measure of current US direct investment abroad in the trade partner is used to reweight the measure of US direct investment abroad in the entire world. Formally, the measure is given by:

Definition 3. *The alternative proxy for US multinational activity abroad is measured at the four-digit NAICS level (indexed by j) but employs data on US Direct Investment Abroad at the two-digit NAICS level (indexed by i where $j \in i$):*

$$\text{DIA}_j = \text{DIA}_i^{US,Partner} \cdot \frac{\text{DIA}_j^{US}}{\sum_{j \in i} \text{DIA}_j^{US}}.$$

We refer to this variable as DIA in Table 3. In the sample of trade agreements examined here, the Spearman correlation between the DIA variables and the related party imports measure is .423. The Pearson correlation of the logged variables is .439.

I also provide in Table **??** information on relative direct investment abroad by US firms, and foreign direct investment in the US by foreign firms, using data from the BEA. These figures are provided for all country

2004. http://www.cnie.org/nle/crsreports/briefingbooks/Agriculture/Agriculture%20in%20the%20Australia-US.htm. Accessed on: October 19 2014.

[28] U.S. Congress. House of Representatives. Committee on Ways and Means. 2011. The Pending Free Trade Agreements with Colombia, Panama and South Korea and the Creation of US Jobs. 112th Congress, 1st session, January 25. http://www.gpo.gov/fdsys/pkg/CHRG-112hhrg67469/html/CHRG-112hhrg67469.htm Accessed on: October 2, 2014.

[29] United States International Trade Commission. 2006. U.S.-Peru Trade Promotion Agreement: Potential Economy-wide and Selected Sectoral Effects. Investigation No. TA-2104-20. From USITC Website. http://www.usitc.gov/publications/docs/pubs/2104f/pub3855.pdf Accessed on October 7 2014. pg. 3-25.

Table B1: US Direct Investment in treaty partners and their FDI in the US

		All sectors			Manufacturing only	
Agreement	US DIA	FDI in US	DIA/FDI	US DIA	FDI in US	DIA/FDI
NAFTA	388200	211300	1.8	104800	42200	2.5
Jordan	100	0	∞	0	0	-
Australia	120000	42500	2.8	14500	6300	2.3
Chile	22800	400	57.0	3200	0	∞
Singapore	113000	16700	6.8	17500	7700	2.3
CAFTA	4900	0	∞	2200	0	∞
Bah/Mor/Oman	200	200	1.0	100	0	∞
Peru	6000	100	60.0	700	0	∞
Col/Pan	11100	3700	3.0	1800	100	18.0
Korea	39500	18200	2.2	11700	2400	4.9
World	3632600	2255800	1.6	526400	743400	0.7

Notes: All FDI and DIA figures are Position on a historical cost basis in millions of dollars, and averaged over 2005-2014.

partners. The main point of this table is that US investment in the agreement partner countries has tended to vastly exceed investment by those same countries in the United States. This suggests that Related-party imports are a reliable proxy for imports to the US by American multinational firms, because such imports are unlikely to be coming from foreign firms invested in the United States.