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Multinational Firms, Value Chains, and Trade Disputes:
Explaining dispute onset at the World Trade
Organization

Aydin Yildirim, Arlo Poletti, J. Tyson Chatagnier, Dirk De Bièvre

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Abstract

In this paper we aim to explain World Trade Organization (WTO) members' decision to initiate a dispute at the WTO. Since many potential violations of WTO law remain unchallenged, we explore the conditions under which WTO members complain about only some allegedly WTO-incompatible policies, while leaving a large majority of them unchallenged. While there may be different reasons why governments choose to initiate certain disputes, we are especially interested in the relationship between potential and actual trade disputes on the one hand and the degree of integration into so-called global value chains (GVCs) on the other. We demonstrate that decision-makers are more likely to try and eliminate barriers to cross-border trade by tabling WTO complaints when facing pressures to do so by firms and sectors highly integrated into such GVCs. Potential complainants' policymakers act strategically when considering whether to initiate a formal dispute. Responding to demands of firms and sectors that are highly integrated in GVCs allows complainants' policymakers to secure the support of politically powerful domestic constituencies while simultaneously minimizing the administrative burdens and the potential negative externalities for bilateral diplomatic relations that a WTO dispute can bring about. We test our hypothesis by examining data from the US using a binomial logistic regression and Cox proportional hazard model and find that trade barriers are both more likely to be filed as disputes and quicker in being tabled at the WTO in sectors highly integrated into GVCs, while controlling for other factors.

Keywords

world trade organization, global value chains, dispute initiation, multinational firms

Introduction*

Since the World Trade Organization (WTO) was established in 1995, judicial politics has become a key feature of international trade relations. With the creation of the WTO, members of the trade regime decided to strengthen existing mechanisms for enforcement of commonly agreed upon rules, and replaced the model of political-diplomatic dispute settlement of the General Agreement on Tariffs and Trade (GATT) with a quasi-judicial model of dispute settlement (Poletti and De Bièvre 2016). Scholarly growing attention to the politics of WTO dispute settlement should come as no surprise. The functioning of a governance system which regulates over € 23 trillion in trade in goods and services on a yearly basis such as the WTO, ultimately depends on its judicial arm's ability to prevent opportunistic behavior by its members, and on its ability to restore compliance when these are found to violate WTO rules (von Stein 2012).

The existing literature has hitherto focused mainly on the political and economy conditions that affect WTO members' propensity to comply with WTO adverse rulings. Previous work highlights that defendants' domestic institutions, affected constituencies political power, disputants' degree of integration in global value chains (GVCs), opponents' economic power and the role of third parties, go a long way in explaining both whether and when WTO members comply with WTO rulings (Bown 2004; Busch 2000; Guzman and Simmons 2002; Poletti and De Bièvre 2014; Yildirim et al. 2017; Rickard 2010; Yildirim 2016, 2017; Sattler et al. 2014; Spilker 2012).

The equally important question how WTO members select their targets in WTO dispute settlement, i.e. complaints they could have brought, but didn't, has received surprisingly little attention however. Why do WTO members' sometimes initiate formal disputes against other members while in other instances they decide to refrain from activating the WTO's dispute settlement system? While understanding the politics of compliance in WTO disputes is certainly important to assess the effectiveness of institutional device for the enforcement of WTO rules, such analyses shed light on only a relatively small part of the universe of empirical phenomena relevant to answer the question of how effective multilateral enforcement of WTO rules is (De Bièvre, Poletti and Yildirim 2017). An exclusive focus on the politics of compliance in formal WTO disputes potentially obscures complaints filed for adjudication in the WTO DSM represent only a small fraction of policies in violation of WTO agreements (Davis 2008, Young 2009). A large number of allegedly WTO-illegal trade barriers simply do not come to the surface because WTO members decide not to challenge them in the WTO DSM. Thus, for all the successes of formal WTO disputes in incentivizing compliance by defendants (Wilson 2007), we can hardly advance meaningful claims about this institutional device's effectiveness without broadening the empirical scope of the analysis to all *potential* WTO disputes, and then uncovering the political logic that leads policymakers to act upon some foreign trade barriers through legal means, while letting other potential disputes unattended. In principle, any move towards a rule-based system should ensure that all relevant stakeholders have equal opportunities to see their rights enforced through legal means. Thus, from a normative standpoint, investigating the political-economic conditions that facilitate or obstruct access to the important public good of credible enforcement of common rules in the WTO in the first place is, at least, as much important as asking how effective the system is in bringing about compliance once it is activated.

This paper addresses this issue by focusing on the causal mechanisms that connect the increasingly relevant phenomenon of Global Value Chains (GVCs) and the political logic of dispute initiation at the WTO. The increasing fragmentation of production processes across the globe in a great number of economic sectors has become a key feature of the contemporary international economy that has crucial

* We extend our thanks to the participants of the European Consortium for Political Research (ECPR) Joint Sessions in Nottingham, UK, in April 2017 as well as the participants who provided valuable feedback at the annual meeting of the Political Economy of International Organizations (PEIO) that took place in Bern, Switzerland in January 2017.

implication for global trade relations (Jensen, Quinn and Weymouth 2015). We contend that the degree of integration in GVCs of firms and sectors that stand behind a potential WTO complaint affect the likelihood that such *potential* complaint will transform into a *formal* WTO dispute. Decision makers in WTO complainants act as gatekeepers of the demands that exporters hurt by allegedly WTO incompatible foreign trade barriers advance to see such barriers removed through the DSM. While formal parties to the DSM are only states, in practice this authority is broadly shared with private organized interests, which provide essential information about trade policies of foreign governments that affect their interests and thus play a key role in monitoring and screening potential complaints (Shaffer 2006; Ryu and Stone 2017; Yildirim et al. 2017).

Potential complainants' policymakers act strategically when considering whether to initiate a formal dispute, balancing different sets of priorities. On the one hand, policymakers have an interest in catering to the demands of powerful domestic constituencies, which is instrumental to enhance their chances re-election or re-appointment (De Bièvre and Dür 2005). Dispute initiation thus works as a signalling device that policymakers use to demonstrate their resolve to defend the interests of politically relevant domestic audiences (Allee and Huth 2006; Davis 2012). On the other hand, policymakers have to weigh in the costs related to administrative burden and diplomatic stakes of the prospective dispute. They will therefore privilege those disputes that they can expect to lead to relatively swift compliance by defendants, as faster compliance entails lower administrative burdens and a lower probability that the dispute generates harmful diplomatic relations. Responding to demands of firms and sectors that are highly integrated in GVCs allows complainants' policymakers to achieve both objectives simultaneously. As one of the forms that global value chains can take, multinational corporations tend to have significant political weight because of the economic resources they dispose of and because of the limited collective action problems they face (Eckardt and Poletti 2016). Moreover, once a complaint is launched, they may work with their foreign affiliates and subsidiaries, and seek to obtain early compliance by defendants in such disputes. More generally, policymakers in complainants can anticipate that initiating a dispute to target a trade barrier that affects firms and sectors highly integrated in GVCs will incentivize greater political mobilization by previously marginalized trade-related interests in the defendant, and will therefore lead to swift compliance (Yildirim et al. 2017). We test our proposition with a dataset of potential US trade disputes against major trading partners. We examine the effect of GVC integration on the probability of dispute initiation, using binomial logistic regression, as well as the time it takes the US authorities to table disputes once they are reported to the USTR using a Cox proportional hazard model. Our results give support to our hypothesis, even when controlling for number of plausible alternatives.

The paper proceeds as follows. The first section reviews the literature on dispute initiation at the WTO and global value chains, while introducing alternative explanations for WTO members to challenge trade barriers at the WTO. We then sketch the empirical puzzle of GVCs with regards to trade barriers and dispute initiation. Next, we present our research design and test the hypothesis we present using regression and duration analyses. Finally, we conclude with a summary of our findings.

Existing literature on dispute initiation in the WTO

When governments initiate a WTO dispute, they work in close coordination with private organized interests, who represent a key "enforcement constituency" in WTO dispute settlement (Iida 2006). WTO members initiate a dispute in response to pressures from domestic producers who think they are denied access to foreign markets on the basis of WTO incompatible rules. Shaffer (2003) characterizes this interaction as a "public-private partnership" that is based on resource interdependencies: private firms identify foreign WTO-inconsistent policies, helping governments monitoring and screening potential complaints, and in exchange the government cooperates with private firms to protect their interests in the form of dispute resolution. Yet, governments do not always react to these pressures. The complaints filed in the WTO DSM represent only a small fraction of the total number of policies allegedly in violation of WTO agreements. A large number of WTO-illegal trade barriers do not come

to the surface because WTO members decide not to challenge them. Existing research suggests that less than 10 per cent of foreign trade barriers brought to the attention of policy makers in the EU and the US are litigated in the WTO (Young 2009). The number of potential WTO disputes that are never litigated may be even larger for developing countries, which face greater obstacles for the filing of cases (Davis 2012). Thus, in the vast majority of cases governments decide to overlook domestic demands for the initiation of WTO disputes.

Several authors stress the importance of WTO members' legal capacity to explain cross-national variance in WTO members' the propensity to initiate disputes (Kim 2008; Busch, Reinhardt and Shaffer, 2009). Yet, this explanation cannot account for how individual WTO members select their targets. Others have focused on "gravitation effects", i.e. market size and depth of bilateral trade relations (Sattler and Bernauer 2011), and on the retaliatory capacity of potential defendants. However, there is a great deal of variation in WTO members' propensity to target countries with similar levels of gravitation dynamics or retaliatory capacity, such as Brazilian government's decision to initiate successive disputes against Argentina as well as the EU and the US.¹ Finally, existing analyses also focus on the domestic political pressure exerted on policymakers in potential complainants WTO by powerful exporting constituencies, suggesting that WTO members' selection of targets is ultimately a function of the interests and political clout of domestic producers demanding litigation (Davis, 2012; Davis and Shirato 2007; Ryu and Stone 2017). These explanations focusing on industrial, sectoral, and firm-level characteristics are better suited to illuminate the choices made by potential complainants with large legal capacity face when deciding to target defendants with large markets and with which they are in a deep trading relationship. Yet, even in these cases governments have to make a choice because they lack the resources to challenge all possible violations of WTO rules substantially affecting trade flows and entailing negative distributive effects for powerful domestic constituencies (Johns and Pelc 2015).

We rely on the literature on the political economy of GVCs to develop an argument that can provide a corrective to these problems. Many studies have stressed the significance of the growing relevance of GVCs for the politics of trade, decreasing demands for protection during economic crises (Milner 1987; Gawande et al. 2015); reducing political support for the imposition of anti-dumping measures (De Bièvre and Eckhardt 2011; Eckhardt 2013, 2015; Jensen, Quinn and Weymouth 2015), and generating greater support for trade liberalization through Preferential Trade Agreements (PTAs) (Antras and Staiger 2012; Baccini et al. 2017; Baldwin 2012; Chase 2003; Eckhardt and Poletti 2016; Kim 2015; Manger 2009; Orefice and Rocha 2014). In the remainder, we complement these studies by developing an argument on how the internationalization and fragmentation of global production organized around these value chains influences the politics of dispute initiation in the WTO. No study has so far looked into how WTO members' integration into GVCs affects the initiation of WTO dispute settlement.

The argument: Global Value Chains and WTO Dispute Initiation

The globalization of production has greatly changed the nature of the political economy of trade. In the past, producers in developed countries bought or produced the bulk of their products and inputs domestically, and then traded finished goods among themselves. Since the 1990s, these producers have redefined their core competencies and turned their attention to innovation and product strategy, marketing, and to the highest value-added segments of manufacturing and services while simultaneously outsourcing labor-intensive, less value-added operations to lower income countries (Gereffi et al. 2005:79). The latter has been done through the creation of foreign subsidiaries—that is, by vertical foreign direct investment (FDI) by multinational corporations (MNCs) — or by relying on

¹ See, for instance, Argentina – Definitive Anti-Dumping Duties on Poultry from Brazil, and EC – Export Subsidies on Sugar.

independent foreign suppliers (Lanz and Miroudot, 2011). These altered (production) structures, which have become particularly common in labor-intensive consumer goods industries as well as the food industry, are usually referred to as global value chains (GVCs).²

The policymakers' calculus

We expect these transformations to affect the politics of dispute initiation in the WTO. To advance our argument, we assume that policymakers are concerned with securing the political support of powerful constituencies if they want to increase their chances of re-election or re-appointment (Grossman and Helpman 1994; Manger 2012; Hiscox 2001). At the same time, in addition to securing economic gains for politically relevant economic actors, policymakers plausibly need to consider a number of different objectives in their foreign economic strategies (Odell 2000). In the context of WTO litigation, two such objectives seem particularly important. On the one hand, they have to worry about the financial and administrative burdens that litigation will bring about. The costs of WTO litigation are significant and even the WTO members that are the least constrained by legal knowledge and resources such as the US and the EU face considerable incentives to consider in advance the potential costs of litigation when deciding to initiate a dispute (Brutger 2017). Perhaps most importantly, policymakers have to consider the potential externalities of a decision to initiate a dispute for their bilateral diplomatic relations. Both arguments suggest that policymakers will be more prone to select potential disputes they can expect to result in swift compliance, both to reduce administrative and legal burdens, and to minimize the possibility that the dispute creates potential harm to diplomatic relations.

Domestic preferences and political clout

From the perspective of the domestic political economy of trade, the most important implication of the increasing relevance of GVCs in the world economy is that international trade flows are largely shaped by patterns of economic integration centered around MNCs, taking the form of both intra-firm trade flows when they directly invest in foreign host countries, or two-way arms-length trade in when they decide to source from unaffiliated parties. In 1999, U.S. parent MNCs accounted for 57 percent of U.S. exports of goods and 35 percent of U.S. imports of goods (Ramondo et al. 2013), with approximately 40 percent of parent exports from affiliates and 44 percent of parent imports from affiliates, while the remaining 60 percent of parent exports and 56 percent of parent imports were undertaken at arms-length. More recent estimates suggest that GVCs have become even more central for international trade, showing that MNCs mediate more than 80 percent of US exports and imports (Bernard et al. 2009; Jensen, Quinn and Weymouth 2015). The increasing importance of GVCs has also led trade in intermediates, rather than finished products, to account for over two thirds of total imports for the majority of OECD countries (Johnson and Noguera 2012) and for about 90 percent of exports of US parents in manufacturing to affiliates abroad (Ramondo et al 2013).

This suggests that whenever complainants are highly integrated in GVCs, policymakers will have strong incentives to cater to the demands of a politically influential constituency favoring the removal of foreign trade barriers. This is so not only because they have obvious stakes in eliminating foreign trade barriers, but also because these the benefits would be highly concentrated in the hands of a few very large and competitive firms. As Jensen, Quinn and Weymouth (2015: 917) note, 'Although exporters are larger, more productive, and more capital intensive than non-exporters, multinationals are even larger and more productive than firms that strictly export'. Thus, because they are large and very productive, these firms can be expected mobilize politically more easily than traditional exporters (Osgood 2017; Plouffe 2017). Moreover, while only 1 percent of US firms both import and export (Bernard et al. 2009), and yet MNCs account for a sizable share of economic activity in the US,

² See, in particular, Gereffi (1999) and Burch and Lawrence (2005) for the expansion of such global linkages in the food industry.

representing more than 27 percent of employment in 2000 and accounting for more than one-third of net job creation in the private sector from 1993 to 2000 (Jensen, Quinn and Weymouth 2015). In short, not only MNCs have huge stake in the elimination of foreign trade barriers, they also have a large capacity to overcome collective action problems to mobilize and weigh in the policymaking process.

Expectations about swift compliance

So far, we argued that complainants' policymakers will be confronted with powerful domestic pressures to initiate WTO disputes against foreign trade barriers affecting firms and sectors highly integrated in GVCs. In addition, in these cases, policymakers can also anticipate that compliance by defendants will be relatively easier to achieve politically. The existence of trade-distorting, potentially WTO-incompatible, trade barriers in the defendant is telling of the domestic political clout of firms benefiting from the existence of barriers to imports of foreign products. The existence of such trade barriers thus suggests that the firms suffering from the trade-restrictive measures found themselves in a marginal domestic political position. The complainant however can expect that the initiation of a trade dispute will change this domestic constellation of political conflict, incentivizing greater political mobilization by these previously marginalized constituencies, as well as by exporters seeking to avoid decreased market access opportunities in the complainant's market as a result of the possible imposition of retaliatory measures in cases on non-compliance (Yildirim et al. 2017). Indeed, the dispute directly touches upon the interests of the very producers, be they affiliated or unaffiliated, that are integrated in the global patterns of production anchored around the MNCs driving the complaint. Whether these producers in the defendant are vertically integrated in the MNC or are unaffiliated, they make a constituency base that has a stake to reduce as much as possible the barriers to trade that exist between their country and the complainant to accrue benefits from cheaper imports (Manger, 2012), but also to avoid the potential costs of retaliatory measures (Bown 2005). Recent research shows that, indeed, when WTO disputes concern trade barriers that affect firms and sectors highly integrated in GVCs, the probability of swift compliance increases dramatically (Yildirim et al. 2017). Finally, the complainants' policymakers can anticipate that MNCs will be able to use their political clout to exert pressure on the defendant's government once the dispute has been initiated. Eckhardt and De Bièvre (2015) show that transnational lobbying, i.e. lobbying by firms on both sides of a WTO complaint to increase chances of compliance, is by no means uncommon in WTO disputes, particularly those involving MNCs.

Research Design

To test the expectations outlined above, we rely on an expanded dataset of trade barriers enacted against the US, originally compiled by Christina Davis (2012). We extend this dataset through 2012 and add information on trade in intermediates between the US and its trading partners. Our dataset thus includes all of the (reported) trade barriers raised against the US by Canada, Mexico, the EU, Brazil, India, Japan, Korea, Malaysia, and Singapore, between 1995 and 2012. Although we recognize that recently raised trade barriers may bring additional variation to our analysis, we have reliable data only through 2012.

Our unit of analysis is the dispute-year. For a given dispute, we include all years until either a dispute is initiated at the WTO, the dispute is resolved bilaterally, or the dataset ends. After excluding cases with missing values, we are left with 2,369 observations. We use these data to examine the effect of GVC integration on dispute initiation at the WTO. In addition to our variable of interest, we control for a number of relevant factors, outlined below.

Our primary dependent variable is whether a trade barrier was filed as a dispute at the WTO. Yet, beyond this binary distinction, we observe that, within the universe of filed disputes, there is significant variation in the *time* it takes for the US authorities to table them at the WTO DSM. In order

to take this variation into account, we run a second analysis, looking at the *time until WTO dispute initiation*.³ This assesses the time it takes the US to challenge a trade barrier at the WTO, from the moment the USTR publishes a summary of what concerned firms and sectors highlighted to them. We tracked each reported trade barrier and marked when the US decided to lodge a case at the WTO to challenge them. Those that never became disputes are treated as right-censored.

Our main independent variable is the affected *sector's GVC integration*. Unfortunately, GVC integration is difficult to measure directly. Therefore, we rely on a series of proxy variables covering three general components of integration: trade in intermediates, vertical intra-industry trade (VIIT), and activities of multinational companies. We measure trade in intermediates using the OECD-WTO Joint Trade in Value Added Database (TiVA) (OECD-WTO 2015), which is the most comprehensive and reliable data source on GVCs compiled so far.⁴ This measure is in line with literature that also considers trade in intermediate goods as both the most important GVC-related factor influencing the domestic politics of trade and the most straightforward measure of internationalization of production (Baccini et al. 2015; Eckhardt and Poletti 2016; Amador and Cabral 2014, 19). One drawback to the TiVA data is that they are available in five-year blocs, reducing temporal coverage. We circumvent this issue by using linear interpolation for the years between observations.⁵ To account for the diminishing marginal effect of increasing trade, we take the natural log of intermediate exports.

We expect VIIT to act as an effective proxy for integration as well since we expect higher levels of VIIT to instigate fiercer political action from economic actors harmed by trade barriers. We calculate the relevant VIIT for a given dispute using the BACI database (Gaulier and Zignago 2010). Following Manger (2012), for each sector, in each year, we first eliminate both one-way trade (i.e., trade for which flows from one side represent less than ten percent of the value of flows from the other) and horizontal trade (i.e., trade in which unit values differ by less than twenty-five percent).⁶ We then aggregate to sectors and apply the Grubel-Lloyd index to the remaining observations, in order to capture the degree of VIIT for a given sector-year.⁷

Finally, perhaps the most direct measure of integration relies on the analysis of the behavior of multinational firms, following the role of MNCs in shaping and advancing networks of production (Baccini et al. 2017), and the increasing mobilization by firms with respect to international economic policies (Osgood et al. 2017). To this end, we data on U.S. Direct Investment Abroad from the Bureau of Economic Analysis.⁸ We look at two features of MNC behavior: parent company transfers to foreign affiliates, and firm assets in foreign countries. We then aggregate to the sector level. Exports to foreign affiliates affect the degree to which trade barriers harm the relevant firm, and should be related to incentives to lobby for dispute initiation. Foreign assets may tap the capacity of the firm, allowing us to account for its lobbying capacity. To account for diminishing returns to each of these variables, we take the natural log.

This provides us with four key independent variables, spanning three different models of dispute initiation. We expect each variable to proxy for integration in the same way. Therefore, we anticipate that all three operationalizations will be positively related to the probability of dispute initiation and negatively related to the time until a dispute occurs.

³ In this case, our unit of analysis is the dispute.

⁴ For the TiVA dataset, see http://stats.oecd.org/Index.aspx?DataSetCode=TIVA2015_C1#.

⁵ Given two coordinates, (x_0, y_0) and (x_1, y_1) , we compute any (x, y) between them as $y = y_0 + (y_1 - y_0) \frac{x - x_0}{x_1 - x_0}$.

⁶ Manger (2012) cites twenty-five percent as the commonly-accepted threshold. Robustness checks at fifteen and thirty-five percent produce nearly-identical results.

⁷ For a given sector, year, the relevant Grubel-Lloyd index (GL_{it}) is constructed by calculating $GL_{it} = 1 - \frac{|X_{it} - M_{it}|}{X_{it} + M_{it}}$, where X_{it} is sector i 's exports in year t and M_{it} is sector i 's imports in year t .

⁸ Data can be found at <https://www.bea.gov/international/usdia2008r.htm>

Control variables

We control for several potentially confounding factors. First, following Sattler and Bernauer (2011), we take into account both the size of trade partners' bilateral trade and their relative economic scale. Large trade volumes might attract a disproportionate amount of disputes because greater economic diversification increases the range of imported goods, and therefore the probability that trade partners will be negatively affected by restrictive trade measures. Additionally, market size affects potential gains from favorable WTO DS rulings. We operationalize this variable as the log of bilateral trade between the US and the potential defendant, using data from the UN's COMTRADE database. Economic size matters because out-of-court settlement of an issue may increase with larger power asymmetries, which increase the complainant's bargaining leverage (Guzman and Simmons 2005). We capture the relative power of the two states by calculating the trade partner's share of dyadic GDP. As this value increases, we should be more likely to see recourse to the DSM.

Second, we take into account the electoral cycle in US presidential elections, since the US government might be more likely to file disputes to garner electoral support in upcoming elections (Pervez 2015)—as when the Bush administration challenged EU governments' Airbus subsidies during his 2004 electoral campaign. We operationalize this variable by coding the years during and immediately prior to a presidential election as 1 and all other years as 0. During these years, trade barriers should be more likely to become actual disputes.

Third, following Johns and Pelc (2015), we consider whether trade barriers affect many WTO members or only a few—that is, whether they are concentrated or diffuse policies. The logic is that trade barriers that cause harm to more members are less likely to be challenged, as these cases engender collective action problems amongst the members. On the other hand, trade barriers that affect only a small sample of the WTO membership, or the US alone, should be more likely to be challenged, as litigation is more like a private good, allowing the US to benefit disproportionately from the removal of the trade barrier. We follow the work of Bown and Reynolds (2015), considering barriers to be *diffuse* if they involve an “internal tax, subsidy, or other regulation that is nevertheless imposed on a most-favored-nation (MFN) conforming basis” and *concentrated* if they involve “antidumping or countervailing duty or a preference scheme” that directly affects US producers (Bown and Reynolds 2015:146). We code concentrated barriers as 1 and diffuse barriers as 0.

Fourth, we control for the possibility that the level of political mobilization in the potential complainant might affect dispute initiation. In line with Davis' (2008) argument, we expect that political contributions will have a substantial effect on trade policy. The most politically active sectors are likely to be the most highly-mobilized, and most likely to get their preferred policy outcomes. We obtain data on political contributions from the Center for Responsive Politics (CRP), which includes industry-level contributions for each election cycle between 1990 and the present.⁹ We make two adjustments to these data. First, the data are not annual, but given over two-year election cycles. When necessary, we simply replicate the same value for both years in the cycle.¹⁰ Second, the industry values in the CRP data do not line up exactly with the ISIC coding. Therefore, where possible, we hand-code the corresponding ISIC industry value.

Fifth, consistent with Guzman and Simmons (2002), we expect that the United States will be better able to extract concessions from the trading partner when it relies less upon the partner as an export market. As the level of export dependence increases, we should be more likely to see empanelment at the WTO. We calculate export dependence as the ratio of exports from the US to the trading partner in

⁹ Data are available from <https://www.opensecrets.org/industries/slist.php>.

¹⁰ For example, contributions from construction firms in 1992 are coded as identical to contributions from construction firms in 1991. Using the preceding (rather than succeeding) even-numbered year, or interpolating between years makes no difference for our substantive results.

a given year to the total value of US exports in that year. These data come from the COMTRADE database.

Finally, preferential trade agreements (PTAs) commonly contain enforcement mechanisms (Dür et al., 2014) that can potentially displace WTO dispute settlement. In this sample, the only relevant PTA is NAFTA. Therefore, we include a dummy variable that takes a value of 1 if the trading partner is Mexico or Canada and 0 otherwise.

GVC integration and trade barriers reported to the US authorities

We begin our investigation with a first look at the data on all foreign trade barriers reported by the US Trade Representative office between 1995 and 2012. Figure 1 shows the frequency with which various sectors are reported to be affected by trade barriers. We display frequency values for eight of the most common categories. This overview provides us with some initial evidence about our hypothesis. Clearly, trade barriers do get enacted in economic sectors characterized by substantial integration into global value chains, and an important part of the universe of potential WTO disputes comprises cases concerning highly-integrated sectors. This stands in contrast to the expectation that, by their very nature, firms active in these integrated sectors would internalize the elimination of trade barriers. Rather, it seems alert their domestic government (the US) about their existence—along with an appeal to try to remove them—only after they are enacted.

Figure 1: Foreign trade barriers reported to the USTR by sector (in %)

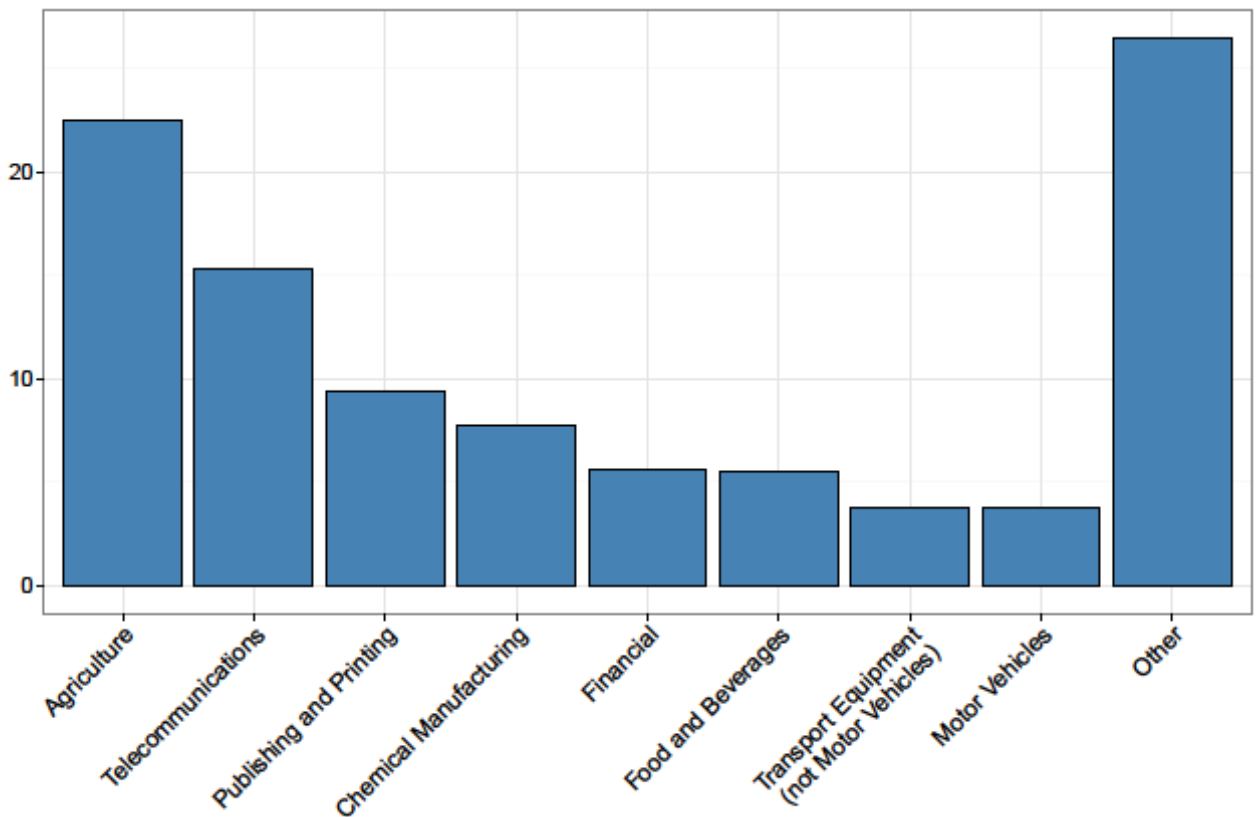
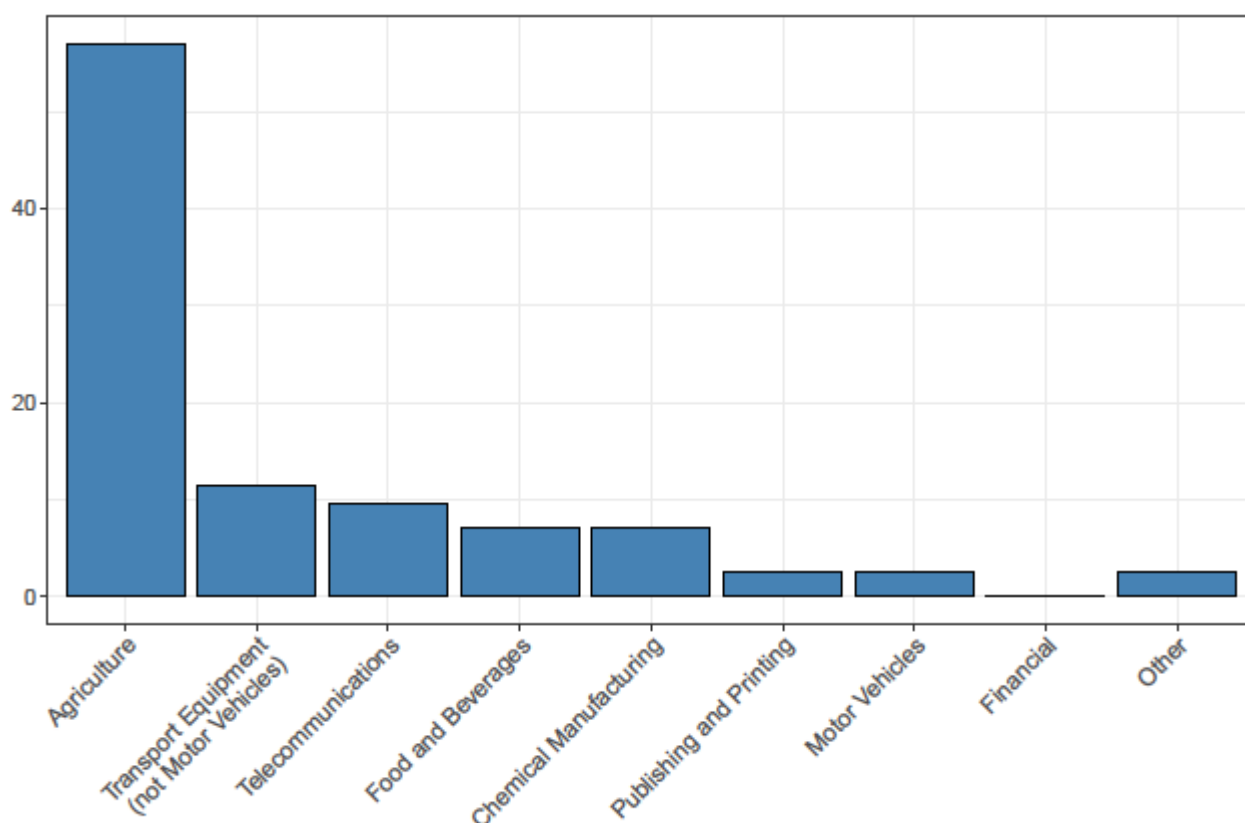


Figure 2 further shows the same sectors with respect to the barriers that the US challenged in WTO disputes. In line with studies showing that agricultural interests traditionally have great influence in trade policymaking (Elsig and Stucki 2012; Davis and Shirato 2007), we first find that initiated disputes are dominated by the agricultural sector. Beyond that, we see several sectors with substantial integration. For instance, transport equipment—a relatively integrated sector—is second only to agriculture in number of initiated disputes. Moreover, sectors like chemical and pharmaceutical production, food and beverages, and information technology are also highly integrated into GVCs. Given the quantity of barriers involving those sectors (Figure 1), there are a considerable number of initiated disputes.

Figure 2: US-initiated WTO disputes against foreign trade barriers by sectors (in %)



Analysis

We now turn to our regression analysis of dispute initiation. We first examine whether reported trade barriers eventually become disputes. As the dependent variable is dichotomous, we estimate a standard logit model. Next, we examine how long it took US authorities to table disputes at the WTO DSM. In this analysis, our variable of interest is the time (in years) until the US lodged a trade dispute at the WTO. Disputes that are ongoing as of the end of our data set and disputes that were resolved bilaterally are treated as censored observations. We analyze these data using a Cox proportional hazard model, which does not require specification of a baseline hazard function and allows for efficient estimation of the partial likelihood function with random right censoring of observations (Efron 1977).¹¹

¹¹ Independent variables are measured during the year in which the barrier was first noted.

Table 1: Logit models

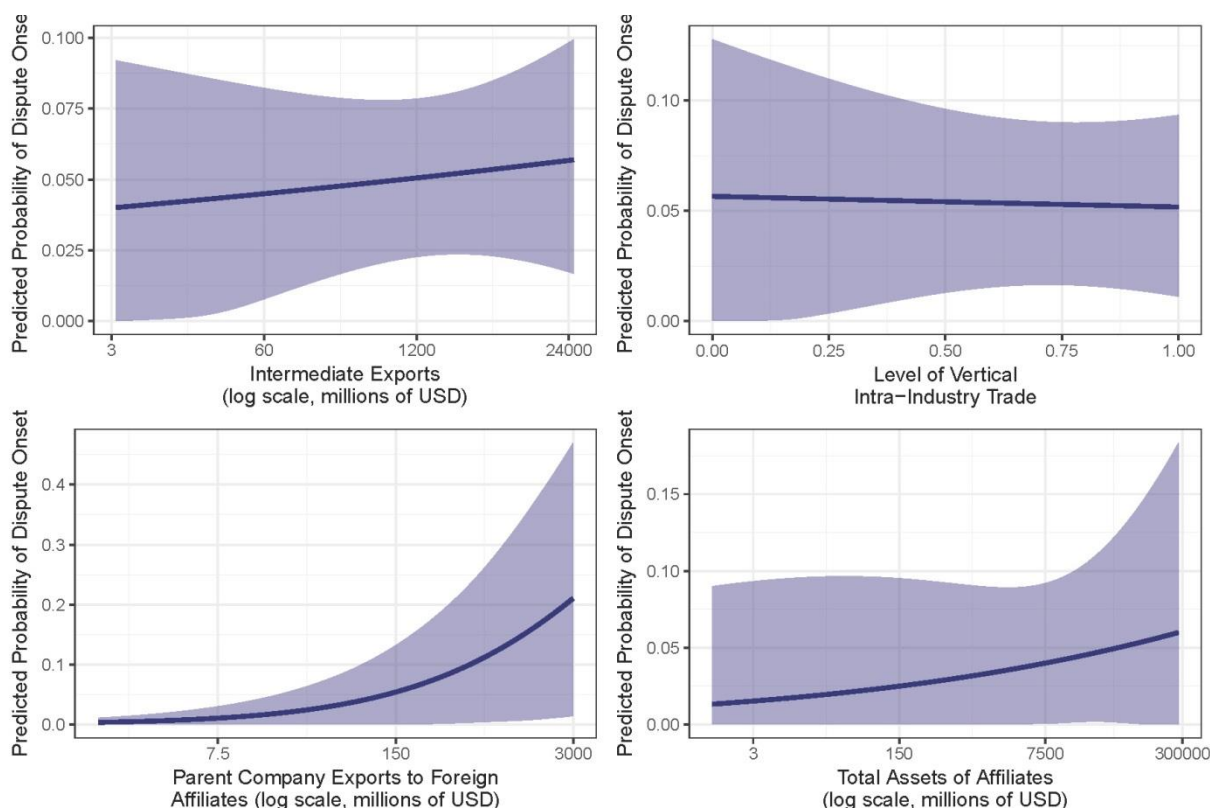
	Baseline	Intermediate Trade	VIIT	MNC
Total Trade (logged)	-1.26 ^{***} (0.32)	-2.24 ^{***} (0.43)	-1.97 ^{***} (0.60)	-2.53 ^{**} (1.09)
Economic Power	7.51 ^{***} (2.15)	15.78 ^{***} (2.82)	12.17 ^{***} (4.44)	5.84 (7.32)
Sector Contributions (logged)	0.07 (0.10)	0.02 (0.11)	0.22 (0.15)	0.24 (0.40)
Export Dependence	6.55 ^{**} (3.22)	6.54 [*] (3.38)	9.77 ^{**} (4.40)	5.72 (8.10)
Election Cycle	0.05 (0.20)	-0.06 (0.22)	-0.14 (0.30)	0.22 (0.53)
Concentrated	0.94 ^{***} (0.28)	0.62 [*] (0.32)	0.73 [*] (0.38)	0.91 (0.72)
NAFTA	3.30 ^{***} (0.74)	6.28 ^{***} (0.98)	4.72 ^{***} (1.34)	4.72 ^{**} (1.97)
Intermediate Exports (logged)		0.04 (0.11)		
VIIT			-0.10 (0.83)	
Parent Company Exports (logged)				0.60 ^{***} (0.21)
Foreign Assets (logged)				0.14 (0.33)
Constant	33.14 ^{***} (9.77)	62.45 ^{***} (12.70)	51.86 ^{***} (17.77)	65.90 ^{**} (32.13)
Log Likelihood	-404.58	-343.02	-181.85	-65.12
Number of Observations	2331	1945	1000	507

^{***} p < 0.01, ^{**} p < 0.05, ^{*} p < 0.1
All tests are two-tailed tests.

Table 1 presents the results of our logit regressions across four different models. Column 1 gives the baseline model, in which we include only control variables. In columns 2 through 4, we add our measures of integration. We expect positive and significant coefficients for our variables of interest. Reassuringly, our control variables generally behave as expected. Additionally, they tend to maintain their signs and levels of significance across the models. When we add our measures of GVC integration, we find significant effects only in one case. While our intermediate exports variable is signed correctly, it is not estimated with significant precision to reject the null hypothesis of no effect. Our measure of vertical intra-industry trade is actually improperly signed, but is also non-significant. When we turn to our estimation using characteristics of MNCs, however, we see that both variables are signed correctly, and we find a significant effect for exports from the parent company to the foreign affiliate, suggesting some support for our argument that greater levels of integration are associated with a higher likelihood of dispute onset.

In addition to examining the statistical effects of our variables of interest—particularly given the low levels of precision in their estimation—it is worthwhile to look at the substantive effects. We do this by calculating the average predicted probability of dispute initiation as we vary each of our factors of interest. We use Hanmer and Kalkan’s (2013) method for calculating average variable effects in both cases.¹² We vary both across the approximate empirical range in our data.

Figure 3: Effect of intermediate exports on probability of dispute initiation



The results in Figure 3 are actually slightly more encouraging. While we see wide 95% confidence bands in all four panels, we see clear positive trends in three of the four, while the sole indicator with a negative estimated effect exhibits a substantive effect that is nearly flat, suggesting that the non-significance is not due exclusively to imprecision. Our lone significant variable—parent company exports—shows a large effect, growing from a near-zero probability of initiation when transfers are low to a probability of greater than 0.2 when they are high. While the majority of our data points are to the left of the center point in the figure, approximately one-third of disputes involved sectors in which parent companies exported more than \$150 million to affiliates during the year in question, suggesting that there still exists a significant cluster of data in the more strongly-convex portion of the graph. We also see a relatively strong substantive trend for quantity of foreign assets, rising from a probability of about 0.013 for firms with no foreign assets to 0.06 when assets exceed \$270 billion. This is an increase of over 450%. However, the large confidence intervals make statistical significance difficult to ascertain.

Table 2 provides the results from our Cox regressions applied to the same models. The sign on the coefficient is related to its expected effect on the hazard (i.e., the likelihood of a dispute occurring). Thus, we should again expect positive coefficients, which would be related to a shorter time until the

¹² Hanmer and Kalkan suggest averaging across all values in the data, which provides the average effect in the population, rather than the effect for a particular case.

dispute occurs. In each case, we test for non-proportional hazards and, where appropriate, interact the offending variable(s) with the log of time (Box-Steffensmeier et al. 2003).

The results in Table 2 are mixed. Two of our indicators—intermediate exports and VIIT—are improperly signed, suggesting that they increase the time until a dispute is initiated, though only the latter achieves statistical significance at the $p < .10$ level. This suggests that higher levels of intra-industry trade are associated with a longer time until dispute initiation, which runs counter to our expectation. Our intuition is largely, supported, however, when we examine MNC behavior. We find positive and significant ($p < .05$) effects for both parent company exports and foreign assets, linking them to higher risks of dispute onset. Interestingly, however, an examination of the Schoenfeld residuals indicates that the proportional hazards assumption is not satisfied for the foreign assets variable. Interacting it with the log of time gives us a negative and significant effect, meaning that the possession of larger quantities of foreign assets reduces the expected time until a dispute, but as time progresses, this effect is diminished. This is not surprising, given that assets can be thought of as a measure of firm capacity; if that capacity is not used by the MNC, then it may be lost.

Turning to a holistic assessment of our results, we see qualified support for our hypotheses. Intermediate exports appear to be mostly unrelated to WTO dispute initiation. Intra-industry trade has a small but negative effect, marginally increasing the time until a dispute occurs. Firm behavior provides the greatest level of consistence with our expectations. Parent company transfers significantly increase the likelihood that disputes occur and reduce the time until initiation. The possession of foreign assets also reduces time until dispute onset, but only if firms act quickly. Taken together, these findings suggest that the relationship between GVC integration and WTO dispute onset is real, but complex.

Table 2: Cox proportional hazard models

	Baseline	Intermediate Trade	VIIT	MNC
Total Trade (logged)	-0.37 (0.35)	-0.83* (0.44)	0.40 (0.62)	0.47 (1.30)
Economic Power	5.73*** (1.98)	11.58*** (2.57)	3.45 (4.24)	-5.77 (8.08)
Sector Contributions (logged)	0.09 (0.09)	0.04 (0.10)	0.78** (0.17)	0.42 (0.48)
Export Dependence	23.18*** (3.24)	25.49*** (3.47)	-5.58 (4.69)	-14.21 (9.40)
Election Cycle	-0.17 (0.20)	-0.27 (0.22)	-0.42 (0.30)	-0.02 (0.55)
Concentrated	1.81*** (0.53)	1.25** (0.61)	0.50 (0.40)	3.35 (2.95)
NAFTA	2.96*** (0.69)	5.01*** (0.89)	1.84* (1.03)	2.36 (2.16)
Export Dependence x ln(Time)	-10.51*** (0.93)	-11.83*** (1.10)		
Concentrated x ln(Time)	-0.38 (0.26)	-0.18 (0.30)		-0.27 (1.32)
Intermediate Exports (logged)		-0.10 (0.10)		
Logged Trade x ln(Time)			-0.86 (0.84)	
VIIT			-2.76* (1.61)	
Economic Power x ln(Time)			-0.19*** (0.02)	
Parent Company Exports (logged)				0.53** (0.23)
Foreign Assets (logged)				1.10*** (0.39)
Foreign Assets x ln(Time)				-0.56*** (0.11)
R ²	0.11	0.13	0.19	0.18
Number of Observations	2331	1945	1000	507

*** p < 0.01, ** p < 0.05, * p < 0.1

Conclusion

In this paper, we investigated the relationship between WTO dispute initiation and the prevalence of firms and sectors integrated into global value chain trade. Our main finding is that the degree of integration into global value chains is indeed an important political determinant of a member state's decision to table a formal complaint to the WTO's Dispute Settlement Body. More precisely, parent MNCs with foreign affiliates appear to be the most active in mobilizing their domestic government to file.

Our findings have important implications for the debate on the future of the world trade regime and for ongoing speculations that challenge the legitimacy and the functioning of the WTO system in general. We show that the high degree of MNC activity in an important number of economic sectors is associated with higher likelihood of dispute onset at the WTO. Thus, despite its decline as a negotiation forum for new and even further liberalization commitments, WTO dispute settlement continues to serve as a forum for domestic trade-related interests to tackle protective foreign trade barriers. Current developments in U.S. trade policy continue to threaten the legitimacy and the functioning of the WTO, including the current administration's unwillingness to appoint a permanent U.S. representative to the WTO, its hostile rhetoric against the organization, and its deliberate attempts to block the appointment of expert panellists that serve at the WTO appellate body. Such blatant actions to undermine the WTO system may be kept at bay as GVCs activate relevant societal actors (i.e., MNCs) that have an interest in targeting protective foreign trade barriers and enacting global trade rules.

Indeed, the domestic and political motives of trade-related stakeholders to seek to uphold existing multilateral trade commitments that we have identified in this paper make it plausible that firms and sectors highly integrated into GVCs will continue to use interstate dispute resolution at the WTO to target foreign trade barriers, mobilizing politically to keep world markets relatively open to their own advantage, even in the face of reluctance from their own political leaders.

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