Trade and Litigate? The Effect of the WTO Dispute Settlement Body on Trade Relations*

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Abstract

Recent research in international relations and political economy suggests that the creation of court-like institutions helps to peacefully settle trade conflicts thereby facilitating economic exchange between states. The World Trade Organization's dispute settlement mechanism offers countries such an opportunity. However, even if a WTO panel rules in favor of the complainant, the institution leaves it to the complainant to enforce compliance with the ruling. This raises the question to what extent WTO rulings indeed affect trade relations between states in a way that differs from what we would observe in the absence of this institutional option. We distinguish a participation, a panel-as-bystander, and a freeriding mechanism of the WTO dispute settlement system and use a non-parametric matching approach to empirically evaluate these arguments. While consultations have no discernible impact, the results suggest that panel rulings have a positive effect on sectoral exports of countries that have initiated a dispute. This rejects the panel-as-bystander argument. Moreover, we find that countries that are affected by the defendant country's trade barriers but have not themselves taken any legal action appear to freeride on the legal efforts of principal party countries: They do not carry the considerable costs of litigation, but experience a massive increase in trading volume with the defendant country after a WTO ruling against illegal trade barriers. We interpret this as evidence for the ability of international court-like institutions to alter anarchic power structures that underly the international trade system.

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1 Introduction

For research on the emergence and effects of institutions, the process of legalization that characterizes world politics and international trade in the last decades constitutes a major phenomenon (Shepsle, 1979; Goldstein and Martin, 2000). Legalization refers to a process that involves obligation, formulation of rules of acceptable behavior, and potentially self-constraining delegation (Goldstein et al., 2000; Abbott et al., 2000). Compared to the high degree of legalization observable in domestic politics (hard law), the vast majority of legalization in international relations must be characterized as soft law, since it lacks enforcement by a coercive sovereign. Against this background, the establishment of international legal institutions that have been delegated authority to look into and formally decide whether states behave in accordance with international trade law constitutes a significant increase in the legalization of world politics and international trade relations.

The World Trade Organization (WTO) constitutes a prime example for the ever stronger legalization of international economic exchange and the evolution of global governance patterns (Lake, 2010). The development and implementation of trade rules since the Second World War essentially has aimed at inducing and enforcing cooperation among states. The WTO Dispute Settlement Body (DSB) plays an important role in this context. This legal body provides a formalized procedure to resolve disputes about the legitimacy of specific trade barriers. A central element of the DSB is the possibility to request the establishment a panel, an independent expert commission, which rules over the dispute if the conflict parties are unable to settle the conflict at the consultation stage. The goal of this arbitrating body is to induce cooperative behavior through different channels. For instance, if parties disagree on the meaning of the trading rules that they subscribed to, a panel ruling clarifies the obligations and rights of the trading partners, or it imposes normative pressure on the discriminating country to end the illegitimate trade policy (Busch and Reinhardt, 2000; Bernauer, Sattler and Spilker, 2010).

Nonetheless, the exact effect and channels through which the WTO DSB affects international behavior remain understudied. To what extent can this international, court-like institution with no genuine sanctionary power enforce international law and effectively

remove illegal trade barriers, thereby stimulating sector exports from formerly discriminated countries and reducing the role of power in international economic relations? While the emergence and workings of international legal bodies, such as the WTO dispute settlement body, the international criminal court or the European court of human rights have been studied extensively (e.g., Carrubba, Gabel and Hankla, 2008; Voeten, 2008), their effectiveness remains subject to scientific and public debate. Although most researchers nowadays accept the claim that international institutions matter, we still lack an understanding of the degree to which international institutions actually have economic effects (Bechtel and Schneider, 2010).

We distinguish and empirically evaluate three arguments on the dispute settlement mechanism. According to the participation argument, a country whose exports suffer from illegal trade barriers imposed by another country can build up pressure by requesting formal consultations within the WTO dispute settlement system. Policymakers will anticipate a negative panel ruling and defendants will grant concessions already in the consultations stage which precedes the establishment of a panel (Busch and Reinhardt, 2000; Reinhardt, 2001). This suggests that exports from the complainant to the defendant country should increase in response to having requested formal consultations. The panel-as-bystander argument holds that since governments will decide to stettle disputes in the consultation stage, only disputes with extremely resolved defendants experience a panel ruling. Because these defendants are extremely resolved, they will decide uphold the trade barriers even after a ruling. Therefore, exports in the sector affected by the trade barriers will remain unresponsive to a panel ruling. The freeride argument highlights the possibility of countries that are affected by trade barriers to refrain from filing a formal complaint. If a country decides not to file a formal complaint in the WTO even though it is affected by the defendant's trade barriers, this reduces public pressure and thereby decreases audience costs to the defendant country. Defendant countries should reward such behavior by stimulating trade relations with the third party in case of a panel ruling. This suggests that panel rulings increase sectoral exports from so called third party countries, i.e. countries affected by trade barriers that have decided not to

file a formal complaint, to complainant countries.

We contribute to the literature in two ways. First, we provide an assessment of how panel rulings affect trade relations by focusing on their effect on sectoral trading volume between complainant and defendant. We analyze all cases and thereby go beyond important work by Davis (2008, 2010), which is most closely related to our study, but exclusively examines cases in which the U.S. appeared as a potential complainant. Second, we evaluate the empirical implications of established theories about the effect of reaching different stages in the WTO's DSB on trade relations along the whole causal chain. To that end we examine the effect of two different treatments on bilateral trade flows: Consultations (consultations versus no consultations) and panel rulings (ruling versus no ruling).

The non-parametric matching procedure we apply constructs pairs of disputes that are comparable with respect to relevant covariates, thereby increasing our confidence that differences in sectoral trading volume result from the treatment and not some other pre-treatment difference between treatment and control disputes. This allows us to estimate the average treatment effect for the treated, i.e. the difference in sectoral trading volume for countries that experienced a treatment (litigant status or ruling) compared to how these countries' trading performance would have developed if there had been no such treatment.

We find that consultations have no discernible impact on trade relations between complainant and defendant countries, which contradicts the participation argument. The results suggest, however, that panel rulings have a positive effect on sectoral exports of countries that have initiated a dispute. This rejects the panel-as-bystander argument. Moreover, we find that countries that are affected by the defendant country's trade barriers but have not themselves taken any legal action appear to freeride on the legal efforts of principal party countries: They do not carry the considerable costs of litigation, but experience a massive increase in trading volume with the defendant country after a WTO ruling against illegal trade barriers. We interpret this as evidence for the ability of international court-like institutions to alter anarchic power structures that underly the

international trade system.

2 Dispute Settlement in the International Trade System

Nations of the world have struggled to harness the gains from globalization. The development and implementation of trade rules since the Second World War has aimed at inducing and enforcing economic cooperation and peace among states acting under anarchical conditions. Although liberalists frequently point out the welfare improvements arising from free trade, they acknowledge that self-interested behavior can prevent international economic exchange and may even jeopardize existing trade relations. The GATT system and its successor, the WTO, then appear as ways to overcome this dilemma because their rules provide clear benchmarks for what constitutes legitimate state behavior in international trade. Moreover, the WTO monitors state behavior, provides information about other states' trade policies and aims at enforcing international trading rules to facilitate the development of international trade relations. Recent studies show that participants in the GATT and WTO systems trade substantially more than non-participants (Goldstein, Rivers and Tomz, 2007) and less frequently impose discriminatory trade policies against other WTO members than against non-members (Busch, Raciborski and Reinhardt, 2008).

Despite the integration of countries into a global trade system, policymakers continue to impose targeted, often sector-specific trade restrictions. The WTO Dispute Settlement Body (DSB) plays an important role in this context. This body provides a formalized procedure to resolve disputes about the legitimacy of specific trade barriers. The DSB offers the possibility to request the establishment of a panel that consists of independent experts in case conflict parties fail to settle their dispute at the consultation stage.

The WTO dispute settlement mechanism aims at inducing cooperative behavior through different channels. For instance, if parties disagree on the meaning of the trading rules that they subscribed to, a panel ruling can clarify the obligations and rights of the trading

partners. Ideally, the ruling provides an objective interpretation of the WTO regulations that all conflict parties accept and defines the a benchmark for future interactions among trading partners around which their expectations converge. Alternatively, if a government consciously and consistently violates WTO rules, a panel verdict against the violator increases the political pressure to abolish the illegitimate trade restriction because failure to comply with a WTO panel verdict damages the government's international reputation (Abbott and Snidal, 1998; Simmons, 2000). For cases in which the defendant refuses to adhere to the panel ruling, the dispute settlement body also provides the legal foundation for retaliatory actions by the plaintiff.

However, the WTO dispute settlement mechanism suffers from apparent weaknesses. First, WTO panels lack the means to enforce their rulings. The defendant can refuse to remove trade barriers that have been found unlawful. Eventually, the plaintiff must demand permission for retaliatory measures from the WTO. These may eventually lead the defendant country to give in. But defendants can also decide to uphold illegal trade barriers. This raises the question to what extent the dispute settlement mechanism can indeed ensure that states will take legal action against illegal trade barriers, in particular those imposed by economically powerful states. Second, we observe an unequal use of the dispute settlement procedure by poor and rich countries, while many poor countries seem to refrain from making use of this institution. This fuels concerns about the effectiveness of the WTO dispute settlement procedure as it may fail to allows disadvantaged countries to effectively proceed against a discriminating trading partner and achieve the removal of illegitimate trade barriers to boost economic development through exports.

Theorizing about the Effects of the WTO DSB on Trade Relations

The benefits from participation in the international trade system differ considerably among member states (Gowa and Kim, 2005). These differences appear to persist even for countries that make use of the WTO's dispute settlement mechanism. Since the WTO dispute settlement body lacks enforcement power, the complainant does not receive any

additional support that goes beyond a mere declaration of trade restrictions to be illegal when trying to build pressure on the defendant to implement the DSB panel ruling. The DSB panel can review and judge the defendant's implementation of the ruling if the plaintiff claims that the defendant fails to comply with the ruling and the panel can authorize retaliatory measures against the discriminating country. However, these measures must be taken by the complainants themselves. Consequently, powerful states have better means to put pressure on an uncooperative defendant. Unsurprisingly, research suggests that defendants are more likely to comply with a panel ruling if the retaliatory power of the opponent country increases (Bown, 2004*b*,*a*) and this fact leads to an unequal use of the dispute settlement body by weak and powerful states.

The unequal use of the DSB and the related decision by governments to initiate a WTO dispute has received considerable attention in the literature. Several studies analyze which disputes governments choose to bring to the WTO and when they decide to address disputes in a different forum or even drop them from their foreign policy agenda (Busch, 2007; Davis and Shirato, 2007; Davis, 2007). Although these decisions do not necessarily indicate a bias of the DSB against disadvantaged states, they suggest that the selection of disputes brought to the WTO is non-random. This carries an important implication for the effectiveness of this international institution: If less countries decide not to use the dispute settlement body because they lack the expertise to follow through with a long-lasting and costly dispute in a highly sophisticated legal system (Allee, 2005, 2010*b*,*a*; Bown, 2005*a*; Busch, Reinhardt and Shaffer, 2009; Davis and Bermeo, 2009; Kim, 2008; Sattler and Bernauer, Forthcoming), this international institution has largely failed to change the anarchic nature of international trade relations.

If a panel rules against the defendant country, we may see a change in trade policy, but only if the complainant has sufficient power to credibly threaten to take countermeasures that harm the defendant's economy and this might have happened even in the absence of WTO adjudication. In this situation, the DSB would not have a causal effect because the same complainant could have achieved a similar result without filing a formal complaint in the WTO.

A meaningful definition of effectiveness would require, however, that the policy adjustment by the discriminating country would have been smaller if the country had not made use of the DSB. As a result, only looking at those cases that actually experienced a ruling may lead us to overestimate the effectiveness of this institution, since those disputes mostly involve countries with sufficient economic power and legal capacity. These considerations suggest that rulings of the DSB should have little if any economic effects on trade relations if compared to a (hypothetical) world without this judicial institution.

However, researchers generally refute the idea that these institutions remain completely fail to influence states' behavior in the international economic arena. Small and weak states often target large and rich states when they engage in the WTO DSB, because expected benefits from exports to the defendant seem particularly high when domestic firms gain better access to large and wealthy economies (Guzman and Simmons, 2005). From this perspective, participation in the WTO's dispute settlement mechanism may prove advantageous even if the opponent country has considerably more power.

Formal Consultations and Sectoral Trade Relations

The literature on international courts and dispute settlement offers nuanced hypotheses about the workings of the WTO DSB and its exact effects on trade policy and trading relations. Theoretical research starts from the caveat described in the previous section noting that the DSB panel is a "court without bailiff [and] its rulings at best can have only a modest direct influence on dispute outcomes" (Busch and Reinhardt, 2000, p.159). Researchers, however, contend that the WTO affects state behavior through other, indirect channels of the dispute settlement mechanism (Busch and Reinhardt, 2000), although the original theoretical analyses take a stronger focus on the old GATT system (Reinhardt, 2001).

According to these models, adjudication at the WTO imposes normative pressure on the defendant government to end the discriminatory practice. Normative pressure mainly arises from a potential panel ruling against the defendant, which publicly discredits the defendant government's trade policy. Since an independent expert commission issues the

ruling, it credibly unveils that the challenged trade barrier violates WTO regulations. The main costs that governments incur from ignoring an adverse panel ruling result from a loss of reputation because the ruling reveals that the government does not live up to the standards of the international trading system that it officially subscribed to. Such a reputation loss may weaken the government's bargaining position in later disputes or in WTO trade negotiations.

Policymakers will anticipate a negative panel ruling and decide to settle the dispute already in the consultations stage which precedes the establishment of a panel (Busch and Reinhardt, 2000; Reinhardt, 2001). Anecdotal evidence and several quantitative analyses support this anticipatory logic. Politicians and bureaucrats tend to emphasize that they can solve trade disputes without having to actually file a formal complaint in the WTO (Davis, 2010, p. 63). Three out of five disputes in the GATT system ended before a panel ruling (Hudec, 1993; Busch and Reinhardt, 2000). Further analyses come to the same conclusion that concessions are greater if they are made prior to a panel ruling, but concessions offered after a panel ruling are small. Moreover, if a panel is established, this leads to more concessions, but if the panel rules in favor of the complainant, this does not have an effect on concessions (Busch, 2000; Busch and Reinhardt, 2003).

Consequently, requesting consultations within the framework of the WTO DSB should lead trade relations to develop differently between the conflict parties as compared to how they would have developed if the conflict had not been brought to the DSB. If the arguments brought forward in the theoretical literature are valid and the WTO dispute settlement body indeed helps to remove illegal trade barriers that hamper the complainant's exports to the defendant country's market, participation in the settlement mechanism should increase trade flows from the complainant to the defendant.

Hypothesis 1 (Consultations) *Consultations within the DSB increase trade flows from the complainant to the defendant country in the sector affected by the trade barrier.*

We can evaluate hypothesis 1 by comparing the development of sectoral trade flows

from the complainant to the plaintiff with the development of exports in other disputes that have not yet requested formal consultations, but are otherwise similar with respect to relevant characteristics.

Panel Rulings and Sectoral Trade Relations in Principal and Further Party Disputes

The available theoretical models allow us to further refine our expectations with respect to the stages at which we should or should not observe effects of WTO rulings on bilateral export flows. These models emphasize the anticipatory effect of panel rulings. Defendants often adjust their trade policies *before* instead of after a ruling. Governments tend to anticipate an unfavorable panel ruling and make concessions already during the consultation stage (Busch and Reinhardt, 2000; Reinhardt, 2001).

By offering concessions at the consultation stage, defendants can avoid the costs arising from retaliation by the complainant. Governments that do not offer concessions during consultations, however, care fairly little about their reputation and the retaliatory measures from the complainant (relative to the benefits that they gain from the discriminatory trade policy). For these countries upholding barriers to trade produces benefits that exceed the costs from experiencing a negative panel verdict and potentially retaliatory measures. Thus, they are unlikely to comply with a ruling if the complainant escalates the conflict to the panel stage. According to this logic, very conflictual disputes will continue even after a WTO ruling (Reinhardt, 2001; Hudec, 1993). Therefore, trade barriers will persist and consequently, sectoral trade flows from the complainant to the defendant will remain unchanged.This suggests that in the case of WTO panel rulings the panel merely resembles a bystander that does not influence trade relations between conflict parties once they have escalated to the panel stage.

Hypothesis 2 (Panel as Bystander) *A panel ruling has no effect on sector exports from the complainant to the defendant country if compared with countries that settled their conflict at the consultation stage.*

Panel Rulings and Sectoral Trade Relations with Third Party Countries

The literature offers predictions on the effectiveness of panel rulings for formal complainants. Unfortunately, we know very little about the potential side effects of such rulings and how they influence third countries that suffer from a discriminatory trade barrier, but do not formally participate in the DSB. One might expect that panel rulings have a positive effect on third countries' exports to the defendant, because concessions made during the consultation stage, if they occur, are bilateral and typically do not apply to non-complainants.[1] Instead, the two conflictive countries agree on how they settle the conflict, e.g. through compensations to the affected industry in the complainant country. This bilateral aspect appears crucial in this stage because the WTO dispute settlement procedure allows for separate negotiations between the defendant and multiple formal complainants, even if these complainants are involved in the same dispute.[2] This implies that the defendant government has considerable leverage with respect to the concessions that it makes to different affected parties.

While the concessions granted to the formal complainants in practice do not diverge massively, bilateralism in consultations appears particularly important for trade policy vis-à-vis third countries that are not formal complainants. A defendant can exploit bilateral negotiations during the consultation stage to grant concessions to the formal complainants, but ignore the effects of its trade policies on other countries. Such a discriminatory strategy towards formal complainants entails higher risk, for if the defendant discriminates against a formal complainant during consultations, this country can increase political pressure on the defendant by requesting a panel. A third country that does not benefit from the outcome of the consultations must formally join the dispute

[1]Countries that join consultations can observe the bilateral negotiations, but they do not have formal rights to oppose the bilateral agreement.

[2]Most empirical studies highlight the possibility to negotiate and settle conflicts bilaterally. It is the major motivation why conflicts that were assigned a single number by the WTO, but involve multiple complainants, are split up into multiple dyads in empirical analyses.

first before it can take such actions. Such a delayed action is often unlikely because the third country government already deliberately chose not to be participate in the dispute. The risk of a panel ruling thus is considerably lower when the defendant discriminates against a third country than when it discriminates against a formal complainant.

The possibility to treat complainants and third countries differently during consultations constitutes an important motivation for the defendant to settle the conflict during consultations and hence to avoid an adverse panel ruling (apart from the mere costs of engaging in a lengthy trial as highlighted by the previous literature). After a panel ruling against the defendant, upholding the discriminatory policies towards third countries becomes much more difficult. A clear ruling against the defendant clarifies any ambiguities about the strength of the case because all non-participants know exactly how an expert panel judges the situation. The ruling not only remedies uncertainty about the content of the dispute, but also about the defendant's resolve to ignore a panel ruling because other WTO members can wait and see how the defendant responds to the ruling. This should reassure undecided third countries to follow the formal complainants into the WTO DSB if the defendant continues to discriminate against them. Moreover, the costs of proving that the defendant's policy violates WTO regulations are minor at this stage.

An example of such a belated engagement in the DSB is Panama's request for consultations with the European Union (EU) in the 'banana case'. The original dispute was launched by The U.S., Mexico, Guatemala and Honduras in September 1995 and a panel ruled over the case in May 1997.[3] Panama only participated as an observer and first remained a third party to this dispute. The EU's reaction to the negative panel ruling indicated that it would not easily comply with the ruling, let alone grant the same concessions to third countries as it may grant to the formal complainants. Consequently, Panama filed an own request for consultations in October 1997.[4]

[3]The WTO dispute number is DS16 for the original case. It was later relaunched under DS27 after Ecuador joined the WTO.

[4]The WTO dispute number is DS105. After the initial free-riding leading to the conviction of the EU, Panama officially participated in follow-up disputes joint with the other countries (DS158 in January 1999) and one alone (DS374 in June 2007). None of those then made it to the panel stage.

This anecdote suggests that third countries can free ride on the investments made by the formal complainants after a panel ruled over a case. If the defendant government complies with an adverse ruling, affected third countries can benefit from greater access to the defendant's market without paying the costs of a trial. If the defendant government does not comply with the ruling, the third country benefits equally little from the ruling as the formal complainants, but it does not have to share the financial burden of a trial. Becoming a third party may also generate additional rewards from the defendant. If a country decides not to file a formal complaint in the WTO even though it is affected by the defendant's trade barriers, this reduces public pressure and thereby decreases audience costs to the defendant country. Defendant countries should reward such behavior, e.g., by stimulating trade relations with the third party in case of a panel ruling. In sum, we expect a panel ruling to increase sectoral exports from third party countries to complainant countries.

Hypothesis 3 (Freeriding) *A WTO DSB panel ruling has a positive effect on exports from third party countries to the defendant.*

3 Estimating the Effects of the Dispute Settlement Procedure

An empirical analysis of the effectiveness of the DSB and the mechanisms behind it must address a number of challenges. Non-random selection of disputes and dyads before and during different WTO dispute settlement stages constitute the most important threats to identification. The theoretical discussion above illustrates how countries can strategically select into DSB and suggests that mainly power and legal capacity drive this choice. The exact functional form of the relationship between these variables and reaching different stages of the dispute settlement mechanism, however, remains beyond current theoretical knowledge.

We use matching techniques to address these issues (Rubin, 1979; Ho et al., 2007).

The matching approach we employ compares the evolution of trade relations between conflict parties at different stages of the settlement mechanism with trade relations of similar dyads that did not reach this stage of the dispute settlement procedure. Similar dyads are country pairs that are comparable on characteristics that influence state behavior in the settlement mechanism. Matching allows us to examine whether trading relations between two countries develop differently after a panel ruling compared to trading relations between to countries of similar economic strength that did not experience a panel ruling.[5] The matching approach is a non-parametric method and therefore has the potential to provide more credible results than standard analyses of observational studies. However, it still relies on the assumption of selection on observables: We have to assume that, after having conditioned on covariates, assignment of the treatment is random.

Measurement, Treatment and Outcome Variable

Our observations $i = 1, ..., N$ are triples of the form complainant country-defendant country-sector. We consider the period 1995 to 2006. A case enters our dataset as soon as a country requests consultations. We have taken this information from the GATT/WTO panel reports from which we also identify the one-digit HS tariff lines of the product under dispute.

Our outcome variable $Y_{i,\tau}$ is the level of exports from the complainant to the plaintiff in the disputed sector at event time τ, where $\tau = 1, ..., 4$ is the number of years after the event we are interested in (consultations or panel ruling). We obtain information about all WTO disputes from 1995 to 2006 from the GATT/WTO panel reports and identify the one-digit HS tariff lines of the product under dispute. We then use the sectoral import/export data from UNCTAD's COMTRADE database to obtain measures of trading volume for the relevant sectors and years. To reduce case heterogeneity we only

[5]This approach is similar to Davis (2008). However, Davis' study compares the effect of WTO adjudication strategies with the effect of negotiation strategies outside the WTO and does not examine how escalation to different stages of the WTO DSB affects sectoral trade relations. Our analysis complements this important previous study.

consider disputes that involve one product category. This leaves us with 961 observations. We restrict our analysis to the four years *after* a panel ruling, since our interest lies in isolating the effect of the panel ruling as such on bilateral trade relations. From this perspective sectoral trading volume resembles a pre-treatment variable on which we presumably need to match to ensure that our treatment and control observations are comparable at baseline, but it does not qualify as an outcome variable.

The analysis proceeds in three steps following the theoretical exposition in the previous section. In a first step, we examine the effect of consultations within the dispute settlement system, i.e. the effect of filing a formal complaint against the trade policy of another WTO member or of officially joining an existing WTO dispute. We construct a treatment indicator $D_{1,i}$ from the GATT/WTO panel reports which equals one if a government requests consultations and is zero otherwise. In a second step, we examine the effect of a panel ruling for those countries that are formal complainants (so called principal and further parties) in the DSB. We constructed a treatment indicator $D_{2,i}$ which equals one if a panel made a ruling and zero for those complainants that requested consultations, but did not experience a panel ruling. To put the participation and the freeriding argument to an empirical test we need to identify countries that are affected by a discriminatory policy, but do not formally join the dispute as an official complainant.

Table 1: Mechanisms and Sets of Cases

	Argument	Stage of the Settlement Mechanism	Relevant Set of Cases
1	Participation	Consultations	All
2	Bystander	Panel Ruling	Complainants
3	Freeriding	Panel Ruling	Third Parties

We draw on the set of countries that engage in a dispute as "Third Parties". These countries are identifiable from WTO documents and must have a "substantial trade interest" in the dispute (Busch and Reinhardt, 2006, 451). We assume that governments must have a nontrivial interest in the defendant's trade policy if they want to become a third party. If anything, this coding strategy leads to conservative results, because including third parties that are not directly affected by the disputed trade barrier leads

us to *underestimate* the true effects. We denote the corresponding treatment treatment indicator that discriminates between these two groups $D_{3,i}$.[6] Table 1 provides an overview of the formal judicial interventions we examine and the comparison groups we employ their effects on trade relations.

Matching Strategy and Confounding Variables

We employ a nearest neighbor matching strategy within an event time setting to estimate the average treatment effect for the treated (ATT) defined as

$$\hat{\alpha}_\tau = \frac{1}{N_1} \sum_{n_1=1}^{N_1} (Y_{1i,\tau} - Y_{0j(i),\tau}), \tag{1}$$

where $n, ..., N_1$ indexes treated units, $Y_{1i,\tau}$ is sectoral trading volume $\tau = 1, ..., 4$ years after the treatment for the treated. The treatment consists either of consultations which allows us to evaluate the participation argument (hypothesis 1) or a panel ruling to evaluate the bystander and the freeriding argument (hypothesis 2 and 3). $Y_{0j(i)}$) denotes the outcome of the control unit closest to i on the covariates X_i in terms of Euclidian distance.[7] Therefore, our estimand $\hat{\alpha}$ identifies how sectoral trading volume would have evolved in countries that experienced consultations or a ruling if there had been no such event.

One might object that we ignore the content of the ruling and that this could induce bias in our estimates. Note, however, that in 216 (98 %) out of the 221 dispute dyads

[6]Other procedures to identify the set of potential complainants, most notably the new World Bank's anti-dumping database (Bown, 2010) and the U.S. reports on trade barriers restricting the access of U.S. firms to other countries (Davis, 2008), have important limitations for this type of study. The first option only allows us to identify the effect of the WTO dispute settlement body and its rulings on very particular trade barriers, specifically anti-dumping measures. It does not allow us to draw conclusions about many other trade restrictions, e.g. tariffs and quota, subsidies, regulations etc., that have played a major role in trade disputes. It would also lead to a considerable drop in the number of observations. The second option appears would exclusively focus on cases that involve the U.S. as a complainant, an exceptionally rich and powerful country, which is quite problematic for an analysis that aims at investigating the effects of the dispute settlement procedures more generally.

[7]Since we match on more than one covariate, we use the diagonal matrix of the inverse sample standard errors of the matching variables to place a relative weight on each variable.

that experienced a panel ruling, the panel ruled against the defendant, while in only five dyads the panel ruled in favor of the defendant.Apart from that these figures underscore the conjecture of strong selection-into-treatment effects that we aim to adjust for by an appropriate matching strategy, they also suggest that our "ruling" treatments as specified in hypotheses 2 and 3 *de facto* consist of a positive panel ruling, i.e. a verdict that finds the trade barriers set up by the defendant to contradict international trade law. Indeed, with only five negative rulings we lack an empirical basis to examine whether the content of a ruling matters. In this sense, our treatment can be thought of as consisting of a positive ruling. We therefore necessarily follow Bown (2004*a*) who excludes disputes in which a panel ruled in favor of defendant because his key interest is in effect of rulings against a defendant.

Our estimation strategy explicitly addresses the comparability of those dispute dyads that experienced a ruling and those that did not by matching on potentially confounding pre-treatment covariates. A variable needs to meet three conditions to qualify as a confounding factor in our context. It needs to be causally prior to the treatment (consultations or rulings) (1), has to influence the outcome (2), and needs to correlate with the treatment (3).

Each of the treatments we intend to examine represents a different stage in the WTO's dispute settlement mechanism and therefore also requires some stage-specific matching covariates. We use both, theory and a pre-matching analysis of the treatments for selecting these covariates. In the pre-matching analysis we separately estimate the probability of experiencing consultations as a function of potential confounders (see section B of the appendix for detailed results). This helps to identify which of the theoretically relevant variables indeed correlates significantly with our different treatments.

According to these conditions we have to match on several covariates (see section B of the appendix for more details). Our first matching variable is the complainant country's (C) and the defendant country's (D) gross domestic product, *GDP(C)* and *GDP(D)*, since the evolution of potential trade conflicts within the WTO depends on countries' economic power Guzman and Simmons (2002), and their capacity to retaliate if a panel

allows sanctions Bown (2005*b*,*a*). We therefore created two variables that measure the complainant and the defendant country's GDP. The data stems from the Penn World Table (Heston, Summers and Aten, 2009).

These pre-matching results suggest that to evaluate the trade effects of consultations (hypothesis 1) we have to match on the complainant's *legal capacity*. Previous work suggests that the potential complainant's legal capacity matters for whether countries formally request consultations Bown (2005*a*). We measure this by the size of the complainant country's (pre-treatment) WTO delegation in Geneva. Our pre-matching analysis of the decision to request consultations using a probit regression (see section B of the appendix) shows that legal capacity indeed helps to predict consultations. We therefore include it in our set of matching covariates.

To evaluate the impact of a panel ruling (hypotheses 2 and 3) the literature and our pre-matching analysis of the data suggest that we have to match on the number of formal complainants in a dispute. Conflicts that attract a greater number of formal complainants are also significantly more likely to proceed to the panel stage (see section B of the appendix).[8]

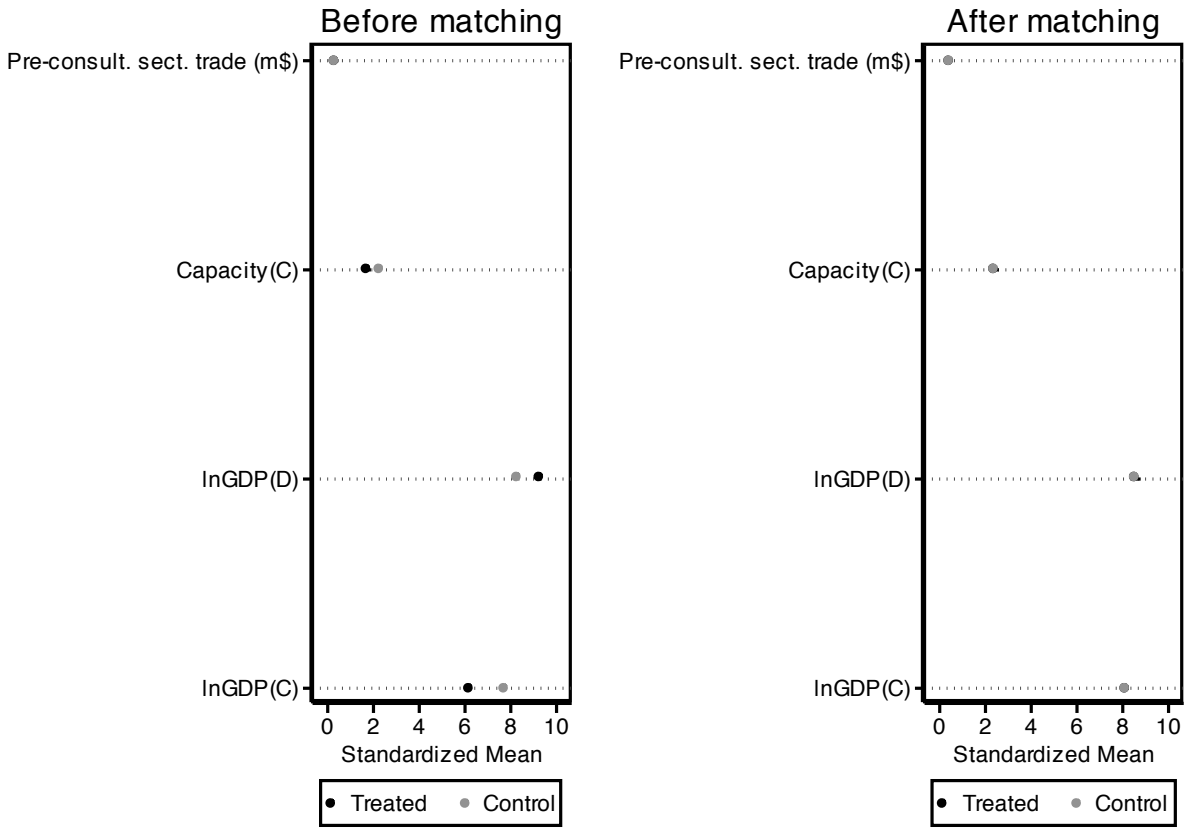
Covariate Balance

We now examine the pre- and post-matching balance of the confounders identified above. Figure 1 displays the standardized means of the potentially confounding variables prior to matching separately for treatment (black dots) and control units (grey dots) together with 99% confidence intervals for the mean in the treatment group. Disputes that enter the consultation stage differ somewhat from those that do not enter the consultation stage with respect to the complainant's legal capacity as well as the defendant's and the complainant's wealth. The left panel in figure 1 shows that the matching procedure

[8]In the robustness section we also account for different heterogeneity across different sectors using propensity score matching. The analysis distinguishes between Agriculture, Natural Resource Extraction, Resource Processing and Simple Manufacturing, Complex Manufacturing, Chemical Industries, Textiles and Services sectors. These sectors were coded based on WTO reports of the disputes. The WTO Dispute Settlement gateway provides the reports, see `http://www.wto.org/english/tratop_e/dispu_e/dispu_e.htm`.

successfully eliminated these differences. Disputes with and without consultations have on average the same values of covariates. This increases the comparability of the treated and control disputes. Section C of the appendix reports the exact numerical values and results form several statistical tests commonly used to assess covariate balance. The overall picture of very good covariate balance remains unchanged.

Figure 1: Covariate Balance Before and After Matching: Participation (Consultations versus No Consultations)

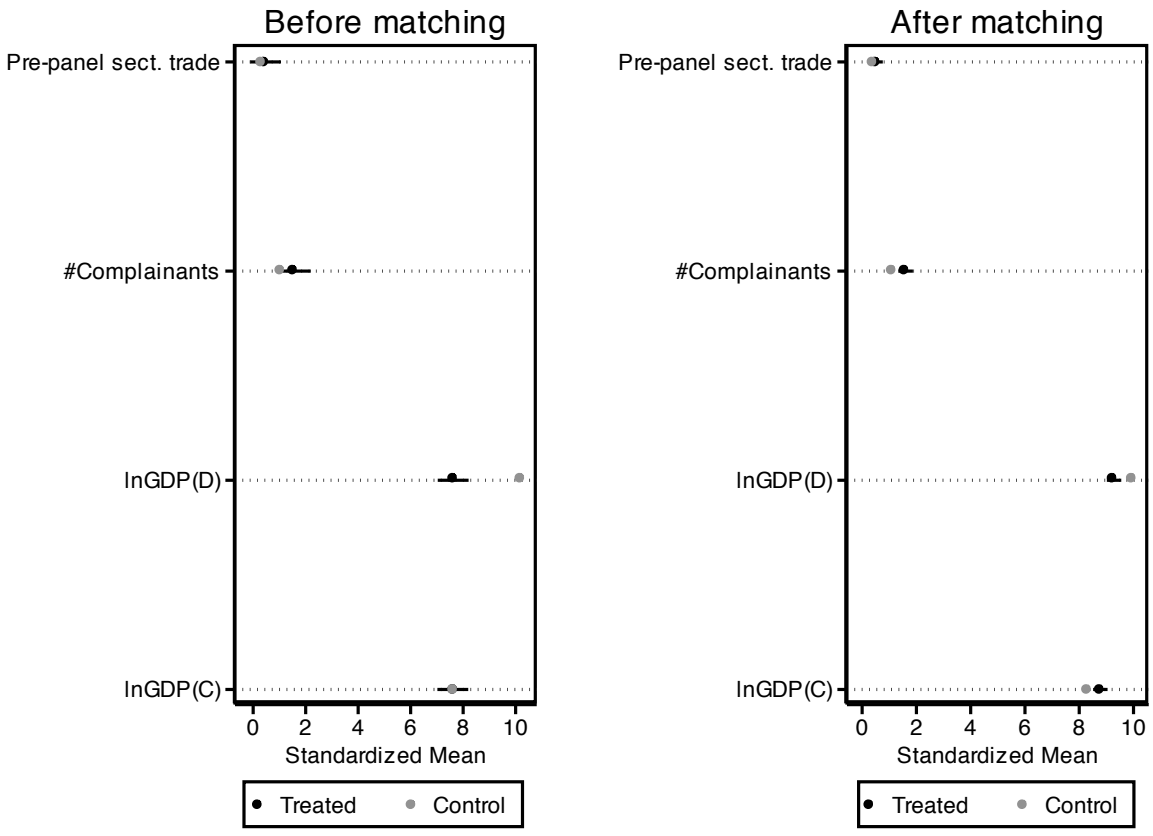


Note: The left panel shows the means of the variables in the treatment and control groups prior to matching, the right panel shows the same quantities after matching. Black horizontal lines depict 99 % confidence intervals.

We now consider the covariate distribution for the our second treatment indicator, which discriminates between principal and further party disputes that experienced a panel ruling (treatment group) and principal and further disputes that experienced no panel ruling (control group). Figure 2 again displays the means of the potentially confounding

variables prior to matching separately for treatment and control disputes. We again achieve very good balance on pre-panel trading volume. The number of complainants seem already relatively balanced in treatment and control groups before matching. We achieve a clear reduction in imbalance on the defendant country's wealth.[9]

Figure 2: Covariate Balance Before and After Matching: Panel Ruling (Principal and Further Party Disputes)

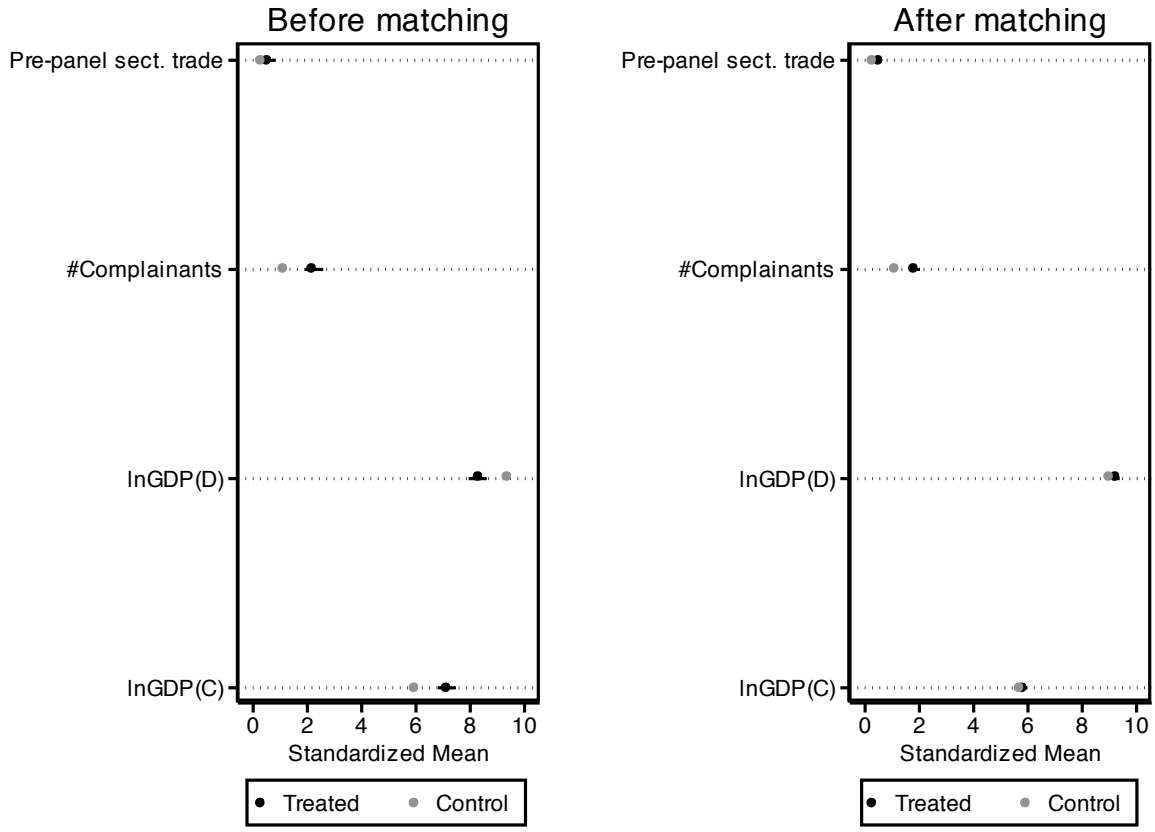


Note: The upper panel shows the means of the variables in the treatment and control groups prior to matching, the lower panel shows the same quantities after matching. Black horizontal lines depict 99 % confidence intervals.

Finally, figure 3 shows the standardized means for third party disputes that experienced a ruling (treatment group) and those that experienced no ruling (control group) before and after matching.

[9]In the robustness section we will employ additional covariates within in a propensity score matching framework.

Figure 3: Covariate Balance Before and After Matching: Panel Ruling (Third Party Disputes)



Note: The left panel shows the means of the variables in the treatment and control groups prior to matching, the left panel shows the same quantities after matching. Black horizontal lines depict 99 % confidence intervals.

We again achieve an acceptable degree of balance on pre-panel sectoral trade volume, which appears crucial, because we might otherwise falsely attribute differences in trade volume from the complainant to the defendant to the fact that it experienced a panel ruling, although these differences already existed before the ruling. The number of complainants still slightly differs across treatment and control groups. We achieve a clear improvement in balance on the complainant's and defendant's GDP, which only marginally differ between treatment and control disputes.

4 Estimates of Disputes Settlement Stages on Trade Relations

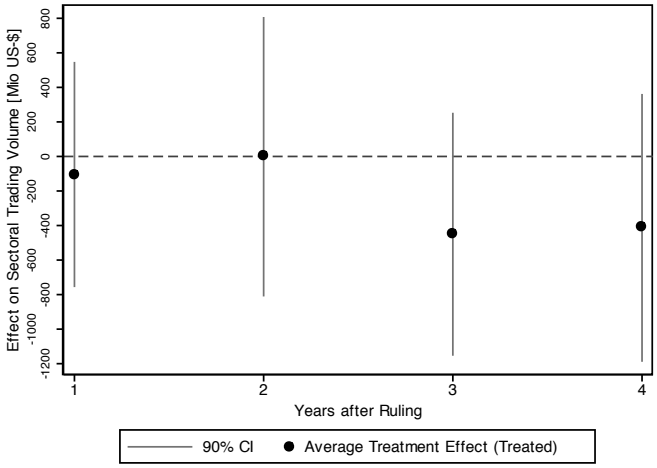
This section presents results on the effects of participating in the WTO dispute settlement mechanism by requesting consultations and the impact of a panel ruling on exports from the complainant to the defendant in the sector affected by trade barriers. We first use our treatment indicator $D_{3,i}$ that discriminates between disputes that have entered the consultation stage and those that have not to estimate the impact of consultations on sectoral exports to the defendant country. Put more practically, we answer whether it matters for how bilateral trade relations develop whether a complainant country is involved in a dispute that has reached the consultation stage as opposed to a complainant that is involved in a dispute that has not reached the consultation stage. This analysis serves as an evaluation of hypothesis 1 which suggests anticipation effects due to the shadow of a panel ruling declaring the trade barriers to violate international trade law.[10]

We directly turn to the results. Figure 4 shows that trade exports do not significantly increase after a complainant has requested consultations over allegedly illegal trade barriers in this sector as compared to how trade develops in control disputes. The point estimates of the average treatment effect for the treated (ATT) are close to zero in years one and two. The 90% confidence interval always intersects with the dotted zero line. This rejects hypothesis 1 and speaks against the anticipation argument brought forward in the theoretical literature. Consultations appear not to play a role when it comes to lifting foreign trade barriers to stimulate sectoral exports.

Figure 5 shows the average treatment effect of a panel ruling for the treated by year after ruling. We only consider principal and further party disputes to evaluate the bystander argument (hypothesis 2). In every year after the ruling, sectoral trading volume in treated disputes exceeds trading volume for control disputes by about billion

[10]We point out, however, that the evidence remains only indirectly informative because ideally we would have data on all potential disputes that we could compare with those in which only consultations were requested. Unfortunately, such data does not exist. Therefore, one may consider this analysis to at least partly serve as substitution for the missing potential disputes observations that could enter the consultation stage.

Figure 4: The Effect of Participation in the Settlement Mechanism on Sectoral Trading Volume (Consultations versus No Consultations)

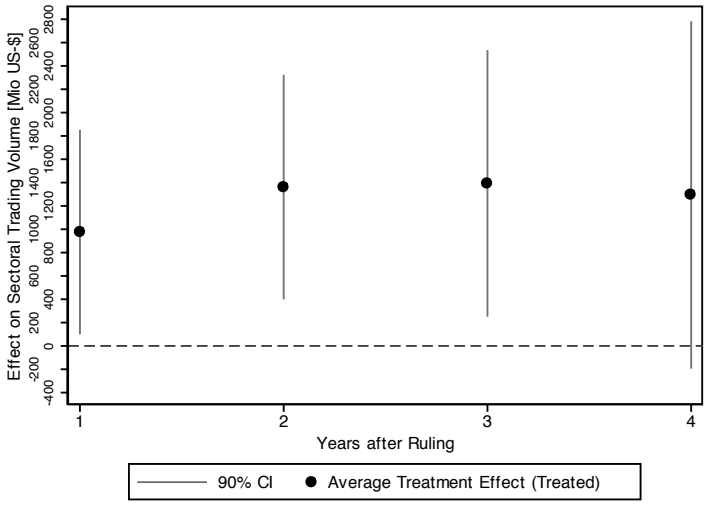


Note: Average treatment effect for the treated (ATT) on trading volume in the sector under dispute in the years after consultations have been requested. Vertical lines depict 90% confidence intervals.

$1 on average. The effect reaches statistical significance in all three years after a ruling and becomes insignificant in the fourth year after the the panel ruling. The removal of trade barriers involves changes in administrative and custom procedures on the side of the defendant. Re-adjustment takes time and this corresponds to the temporal pattern we observe, with the effect increasing until year 3 and decaying afterwards. This rejects the bystander argument. To the contrary, panel rulings seem to help increasing sectoral exports from the complainant to the defendant country.

Figure 6 reports the effect of panel rulings for third party disputes that experienced a ruling. We again find a significant average treatment effect for the treated. Sectoral exports from the third party countries that are affected by the trade barriers increases significantly in the years after a ruling. The effect peaks in years one and two, where it amounts to about two billion $ on average, and then drops by about 50 percent to around one billion $ in years three and four. This supports the freeriding argument. Exports from third party countries that did not formally file a complainant against sectoral trade barriers in the WTO to the defendant tend to increase strongly in response to a WTO panel ruling.

Figure 5: The Effect of a Panel Ruling on Sectoral Trading Volume (Principal and Further Party Disputes)



Note: Average treatment effect for the treated (ATT) on trading volume in the sector under dispute in the years after a panel ruling. Vertical lines depict 90% confidence intervals.

This finding supports the freeriding argument. Third party countries seem to free ride on the investments made by the formal complainants after a panel ruled over a case.

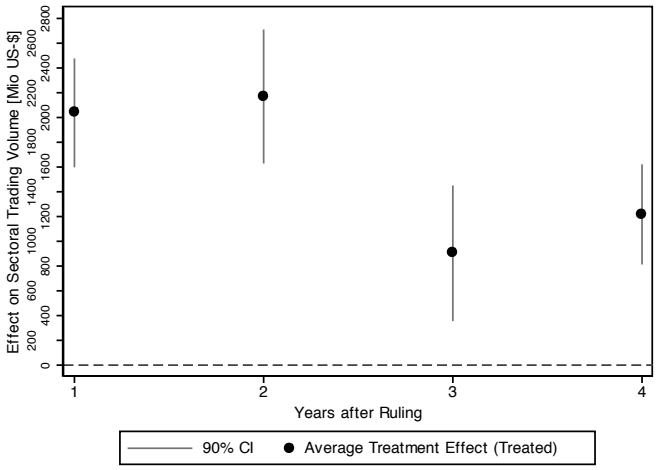
We also conducted a battery of additional tests to evaluate the robustness of the results. We used propensity score matching with more covariates and reestimated all results.[11] The effects remain unchanged. We also reestimated the effects using the percentage change in trading volume as outcome variable. The findings are largely unchanged, except that the treatment effect for third party disputes is only significant in year two, but still of considerable magnitude.

5 Conclusion

For research on the emergence and effects of institutions, the process of legalization that characterizes world politics and international trade in the last decades constitutes a major phenomenon (Shepsle, 1979; Goldstein and Martin, 2000). Compared to the high degree of legalization observable in domestic politics (hard law), the vast majority

[11]Section D reports detailed results.

Figure 6: The Effect of a Panel Ruling on Sectoral Trading Volume (Third Party Disputes)



Note: Average treatment effect for the treated (ATT) on trading volume in the sector under dispute in the years after a panel ruling. Vertical lines depict 90% confidence intervals. The control group consists of those disputes in which consultations were requested and/or a panel was established, but the dispute ended without a panel ruling.

of legalization in international relations represents soft law, since it lacks enforcement by a coercive sovereign. Against this background, the establishment of international legal institutions that have been delegated authority to look into and formally decide whether states behave in accordance with international trade law constitutes a significant increase in the legalization of world politics and international trade relations (Goldstein et al., 2000; Abbott et al., 2000).

In this paper we have examined the effects of an important example of the legalization in international trade relations by looking into the effects of the WTO dispute settlement mechanism on bilateral trade relations. We distinguish three theoretical mechanisms that specify how formally requesting consultations and panel rulings influence trade relations between countries. According to the participation mechanism, consultations should, on average, have a positive effect on exporters from the complainant to the defendant country, because they anticipate a panel ruling and therefore opt for settling a deal already at the consultation stage. The bystander argument posits that once a dispute has reached the panel stage, defendant countries are already extremely resolved and therefore, the defendant will not react to a ruling that declares the trade barriers as illegal. This sug-

gests that panel rulings have no effect of exports from principal party complainants to defendant countries. The freeriding argument highlights the possibility for countries that are affected by a trade barrier to await a ruling against the defendant without having to file their own formal complaint in the WTO. Since these so called third party countries decide to lower reputation costs to the defendant country despite being affected by the defendant's sectoral barriers to trade, they may actually expect a reward for such friendly behavior in the form of intensified exports to the defendant country.

Using a matching approach we find that consultations have no effect on sectoral exports from complainant to defendants. This rejects the theory underlying the participation mechanism. Second, the results suggest that panel rulings increase exports from principal and further party countries to defendant countries, which also is at odds with the logic stipulated by the bystander argument. Finally, we find that panel rulings significantly increase exports from third party complainants to defendant countries. While this is in line with the idea of defendants rewarding countries for not filing a formal complaint in the WTO even though illegal trade barriers hamper their exports, this is suggestive of a collective action problem in which third party countries can freeride on the legal efforts of principal party countries in terms of removal of illegal barriers to trade without carrying the costs of taking legal action.

References

Abbott, Kenneth W. and Duncan Snidal. 1998. "Why States Act through Formal International Organizations." *Journal of Conflict Resolution* 42(1):3–32.

Abbott, Kenneth W., Robert O. Keohane, Andrew Moravcsik and Anne-Marie Slaughter. 2000. "The Concept of Legalization." *International Organization* 54(3):401–419.

Allee, Todd. 2005. "Developing Countries and the Initiation of GATT/WTO Disputes." Paper Presented at the Meeting of the International Studies Association, Honolulu.

Allee, Todd. 2010*a*. "Going to Geneva: Trade Protection and Dispute Resolution under the GATT and WTO." Book Manuscript, University of Illinois.

Allee, Todd. 2010*b*. "Legal Incentives and Domestic Rewards: A Litigation Model of GATT/WTO Dispute Resolution." Manuscript, University of Illinois.

Bechtel, Michael and Gerald Schneider. 2010. "Eliciting Substance from 'Hot Air': Financial Market Responses to EU Summit Decisions on European Defense." *International Organization* 64(2):199–223.

Bernauer, Thomas, Thomas Sattler and Gabriele Spilker. 2010. "WTO Dispute Resolution and Escalation: How Bargaining Dynamics Vary Across Dispute Types." Manuscript, University College Dublin and ETH Zurich.

Bown, Chad P. 2004*a*. "Developing Countries as Plaintiffs and Defendants in GATT/WTO Trade Disputes." *The World Economy* 27(1):59–80.

Bown, Chad P. 2004*b*. "On the Economic Success of GATT/WTO Dispute Settlement." *Review of Economics and Statistics* 86(3):811–823.

Bown, Chad P. 2005*a*. "Participation in WTO Dispute Settlement: Complainants, Interested Parties, and Free Riders." *The World Bank Economic Review* 19(2):287–310.

Bown, Chad P. 2005*b*. "Trade Remedies and World Trade Organization Dispute Settlement: Why Are So Few Challenged?" *Journal of Legal Studies* 34(2):515–555.

Bown, Chad P. 2010. "Global Antidumping Database." Available at http://econ.worldbank.org/ttbd/gad/.

Busch, Marc L. 2000. "Democracy, Consultation, and the Paneling of Disputes Under GATT." *Journal of Conflict Resolution* 44:425–446.

Busch, Marc L. 2007. ""Overlapping Institutions, Forum Shopping, and Dispute Settlement in International Trade."." *International Organization* 61(4):735–761.

Busch, Marc L. and Eric Reinhardt. 2000. "Bargaining in the Shadow of the Law: Early Settlement in GATT/WTO Disputes." *Fordham International Law Journal* 24(1/2):158–172.

Busch, Marc L. and Eric Reinhardt. 2003. "Developing Countries and GATT/WTO Dispute Settlement." *Journal of World Trade* 37:719–735.

Busch, Marc L. and Eric Reinhardt. 2006. "Three's a Crowd: Third Parties and WTO Dispute Settlement." *World Politics* 58(3):446–477.

Busch, Marc L., Eric Reinhardt and Gregory Shaffer. 2009. "Does Legal Capacity Matter? A Survey of WTO Members." *World Trade Review* 8(4):559–577.

Busch, Marc L., Rafal Raciborski and Eric Reinhardt. 2008. "Does the Rule of Law Matter? The WTO and U.S. Antidumping Investigations." Manuscript, Emory University.

Carrubba, Clifford J., Matthew Gabel and Charles Hankla. 2008. "Judicial Behavior Under Political Constraints: Evidene from the European Court of Justice." *American Political Science Review* 102(4):435–452.

Davis, Christina. 2007. "Forum Choice in Trade Disputes: WTO Adjudication, Negotiation, and U.S. Trade Policy." Paper Presented at the Meeting of the International Political Economy Society, November, Stanford University.

Davis, Christina. 2008. "The Effectiveness of WTO Dispute Settlement: An Evaluation of Negotiation Versus Adjudication Strategies." Paper Presented at the Annual Meeting of the American Political Science Association, Boston, August 28-31.

Davis, Christina. 2010. "Why Adjudicate? Enforcing Trade Rules." Book Manuscript, Princeton University.

Davis, Christina L. and Sarah Blodgett Bermeo. 2009. "Who Files? Developing Country Participation in GATT/WTO Adjudication." *Journal of Politics* 71(3):1033–1049.

Davis, Christina L. and Yuki Shirato. 2007. "Firms, Governments, and WTO Adjudication: Japan's Selection of WTO Disputes." *World Politics* 59(2):274–313.

Goldstein, Judith, Douglas Rivers and Michael Tomz. 2007. "Institutions in International Relations: Understanding the Effects of the GATT and the WTO on World Trade." *International Organization* 61(1):37–67.

Goldstein, Judith and Lisa L. Martin. 2000. "Legalization, Trade Liberalization, and Domestic Politics: A Cautionary Note." *International Organization* 54(3):603–632.

Goldstein, Judith, Miles Kahler, Robert O. Keohane and Anne-Marie Slaughter. 2000. "Introduction: Legalization and World Politics." *International Organization* 54(3):385–399.

Gowa, Joanne and Soo Yeon Kim. 2005. "An Exclusive Country Club: The Effects of the GATT on Trade, 1950-1994." *World Politics* 57(4):453–478.

Guzman, Andrew and Beth A. Simmons. 2002. "To Settle or Empanel? An Empirical Analysis of Litigation and Settlement at the World Trade Organization." *Journal of Legal Studies* 16:205–235.

Guzman, Andrew and Beth A. Simmons. 2005. "Power Plays and Capacity Constraints: The Selection of Defendants in WTO Disputes." *Journal of Legal Studies* 34(2):557–598.

Heston, Alan, Robert Summers and Bettina Aten. 2009. "Penn World Table Version 6.3." Center for International Comparisons of Production, Income and Prices at the University of Pennsylvania, http://pwt.econ.upenn.edu/.

Ho, Daniel, Kosuke Imai, Gary King and Elizabeth Stuart. 2007. "Matching as Nonparametric Preprocessing for Reducing Model Dependence in Parametric Causal Inference." *Political Analysis* 15(3):199–236.

Horn, Henrik and Petros C. Mavroidis. 2008. "The WTO Dispute Settlement Data Set 1995-2006." World Bank Manuscript (http://go.worldbank.org/X5EZPHXJY0).

Hudec, Robert E. 1993. *Enforcing International Trade Law: The Evolution of the Modern GATT Legal System*. Butterworth Legal.

Kim, Moonhawk. 2008. "Costly Procedures: Divergent Effects of Legalization in the GATT/WTO Dispute Settlement Procedures." *International Studies Quarterly* 52(3):657–686.

Lake, David. 2010. "Rightful Rules: Authority, Order, and the Foundation of Global Governance." *International Studies Quarterly* 54(3):587–613.

Reinhardt, Eric. 2001. "Adjudication without Enforcement in GATT Disputes." *Journal of Conflict Resolution* 45(2):174–195.

Rubin, Donald B. 1979. "Using Multivariate Matched Sampling and Regression Adjustment to Control Bias in Observational Studies." *Journal of the American Statistical Assocation* 74(366):318–328.

Sattler, Thomas and Thomas Bernauer. Forthcoming. "Gravitation or Discrimination? Determinants of Litigation in the World Trade Organization." *European Journal of Political Research* .

Shepsle, Kenneth A. 1979. "Institutional Arrangements and Equilibrium in Multidimensional Voting Models." *American Journal of Political Science* 23(1):27–59.

Simmons, Beth A. 2000. "International law and state behavior: Commitment and compliance in International monetary affairs." *American Political Science Review* 94(4):819–835.

Voeten, Erik. 2008. "The Impartiality of International Judges: Evidence from the European Court of Human Rights." *American Political Science Review* 201(4):417–433.

A Coding of Conflicts and Country Status

The WTO Dispute Settlement Gateway lists the disputes we analyze (`http://www.wto.org/english/tratop_e/dispu_e/dispu_status_e.htm`, see also Horn and Mavroidis (2008)). For each dispute, one or multiple complainants initiated a dispute against a single defendant. To code the set of interested third countries that are not formal complainants in a dispute, we identify the countries that a) officially requested to join consultations or b) officially participated as Third Party in a dispute (or both). When a country initiates a dispute against another by requesting consultations, other WTO members can request to join and observe consultations, but they are not formal complainants. When a panel is established for a particular dispute, countries can request Third Party status.[12] Table 2 shows the distribution of cases (complainant-defendant-sector) by complainant's status and ruling.

Table 2: Distribution of Complainant's Status and Panel Ruling

Complainant's status	Panel ruling			
	Not yet	No	Yes	Total
Principal	2	23	112	137
Joining Party	0	1	12	13
Third Party	12	63	412	487
Total	14	87	536	637

Several WTO disputes are related, i.e. the same or different complainants initiate multiple disputes that address the same or very similar trade barriers imposed by the same defendant. This entails several complications. First, a country may appear multiple times as a complainant in related disputes because it initiated two different disputes on the same matter, but only pursues one of the two further. Thus, a particular dispute may *de iure* have ended after consultations, but *de facto* the conflict escalated to the panel stage via a second dispute on the same matter.[13] Second, a country can be a Joining or Third Party (and not a formal complainant) in one dispute, but simultaneously file a dispute against the same defendant on the same issue.[14] Thus, a country can be a Joining Party and a formal complainant in two related disputes with the same defendant. This means that we would treat a country as non-complainant (Joining Party), although it is a de facto complainant (because it participates as complainant in a different, related dispute). It is important for our research to distinguish between those Joining or Third Parties that remain observers and those that initiate their own dispute.

To address this problem, we code whether disputes are related, i.e. if different disputes listed by the WTO address the same disputed trade measure by a defendant. The dispute descriptions on the WTO Dispute Settlement Gateway explicitly note which conflicts are related conflicts.[15] Disputes that, according to the Gateway information, are identified as related generally have the same defendant (as we would expect), except 11 pairs of related

[12] An official 'Third Party' status does not exist for consultations.

[13] There are 23 pairs of disputes that represent such multiple initiations. For a detailed list, see below.

[14] Examples are disputes DS248, DS249, DS251, DS252, DS253, DS254, DS258 and DS259.

[15] As an example, Venezuela and Brazil filed formally separate complaints against the

disputes.[16] For a fair amount of those, the two different defendants are the European Union and an EU country.[17] We treat those as a single dispute with the EU as defendant. In other cases, the defendant initiated a dispute against one of the principal complainants in a previous dispute.[18] We treat those as separate conflicts. In other words, if some of the multiple, related disputes have the same defendant, we treat them as related. If they have different defendants, we treat them as unrelated.[19]

The data show that there is considerable overlap between our coding of related disputes and the establishment of a common (cross-dispute) panel (if a panel was requested). 20 pairs of related disputes with a total of 52 dyads have a common panel. 10 pairs of disputes with a total of 24 dyads have separate panels although the disputes are coded as being related.[20] We re-checked all of them, but the re-analysis shows that they are all closely related despite separate panels.[21]

Once we identified the related disputes, we examine whether countries appear multiple times as Joining or Third Parties in related disputes. If countries appear multiple times,

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United States in early 1995 (DS2 and DS4). But the Gateway descriptions for the two disputes indicates that "Venezuela requested consultations on 24 January 1995 and Brazil on 10 April 1995" (`http://www.wto.org/english/tratop_e/dispu_e/cases_e/ds2_e.htm`), which allows us to infer that DS2 and DS4 are related despite being formally different disputes. The same applies to other related disputes.

[16](DS16; DS27; DS158; DS165), (DS26; DS39; DS48; DS320; DS321), (DS62; DS67; DS68), (DS82; DS115), (DS99; DS296; DS299; DS336), (DS124; DS125), (DS166; DS223), (DS172; DS173), (DS248; DS249; DS251; DS252; DS253; DS254; DS258; DS259; DS260; DS274), (DS273; DS301; DS307) and (DS316; DS317).

[17](DS62; DS67; DS68), (DS82; DS115), (DS124; DS125) and (DS172; DS173)

[18](DS158; DS165), (DS166; DS223), (DS273; DS301) and (DS316; DS317)

[19]In two instances, there is a mix of the two cases described in this paragraph: (DS26; DS39; DS48; DS320; DS321) are officially related, but (DS26; DS48) are by the United States and Canada against the EU (the 'hormones' case), while (DS39; DS320; DS321) are by the EU against the U.S. and Canada to remove retaliatory measures in the 'hormones' case. We treat the first two disputes as related and the latter three as distinct disputes. Similarly, (DS248; DS249; DS251; DS252; DS253; DS254; DS258; DS259; DS260; DS274) are related, with (DS248; DS249; DS251; DS252; DS253; DS254; DS258; DS259, DS274) being initiated by different countries against the United States (the 'steel' case) and DS260 being initiated by the United States against the EU, which is one of the previous complainants against the U.S. (DS248). We treat all of the related except DS260, which is the only one not against the United States. In one instance, the same complainant initiated a series of related disputes against different defendants (DS99; DS296; DS299; DS336). We treat these are separate (unrelated) disputes.

[20]This is the case for the following disputes: (DS7; DS12; DS14), (DS18; DS21), (DS26; DS48), (DS32; DS33), (DS50; DS79), (DS56; DS77), (DS106; DS126), (DS121; DS164), (DS138; DS212; DS213) and (DS236; DS257; DS264; DS277)

[21]As an example, the WTO Gateway reports that DS7, DS12 and DS14 are related ("Complaints by Canada, Peru and Chile"). Nonetheless, two separate panels were established: "A panel was established at the request of Canada on 19 July 1995. A joint panel was established on 11 October 1995 at the request of Peru and Chile on the same subject." See `http://www.wto.org/english/tratop_e/dispu_e/cases_e/ds7_e.htm`. The same for (DS26; DS48), (DS32; DS33), (DS50; DS79), (DS56; DS77), (DS106; DS126) and (DS121; DS164).

we always code the highest possible status that a country reached in these related disputes. We do this with the following algorithm. First, if a country appears as both Joining and Third Party in the same conflict or in related conflicts, it is coded as Third Party only. [Countries can be both Joining Countries during consultations and then later Third Parties when a dispute proceeds to the panel stage. Countries can also be Joining Parties in one dispute and Third Party in another that escalated to the panel stage.] Second, if a country appears multiple times in related disputes because it is a Joining Party in one dispute, but a complainant in another related dispute, we treat this country as a formal complainant in this conflict.[22] Third, we do the same for Third Parties that act as complainants in a related dispute.

In a fair amount observations, we have multiple dispute initiations by the same complainant against the same defendant on related issues.[23] This is because countries sometimes filed two disputes against the same defendant on (almost) the same case, but only one was pursued further, for different reasons.[24] As before, we code the highest status that a complainant reaches for all related disputes. For instance, if no panel was requested for the first dispute, but for the second, we only consider the dispute with the panel. If no ruling occurs for the first dispute, but for the second, we only consider the dispute with the ruling. As start date, we use the date when the dispute that reached the highest status was initiated. If both disputes reach the same escalation level, we use the dispute that started later. A re-analysis of all multiple initiations shows that all of them in fact deal with the same issue. With a few exceptions, all of them were initiated closely to each other (6 months or less). Two addressed the same issue, but for explicitly different time periods. We therefore treat them as separate conflicts.[25]

[22]I.e. we erase the observation in which the country is a Joining Party in a related dispute and only keep the one where it is a complainant.

[23](DS3; DS41), (DS16; DS27), (DS32; DS33), (DS44; DS45), (DS55; DS64), (DS60; DS156); (DS74; DS102), (DS85; DS151), (DS87; DS110), (DS101; DS132), (DS106; DS126), (DS140; DS141), (DS149; DS279), (DS171; DS196), (DS182; DS191), (DS185; DS187), (DS212; DS213), (DS228; DS230), (DS236; DS247; DS257; DS264; DS277; DS311), (DS270; DS271), (DS300; DS302), (DS314; DS341), (DS324; DS343) and (DS325; DS344).

[24]For instance, it happened that the complainants refiled the case to include a country that joined the WTO in the meantime, e.g. in the 'banana case' (DS16; DS27) when Ecuador only joined the WTO after the initial dispute was filed. Sometimes, the allegations show minor differences in the argumentation, but only one dispute (presumably the one with the argumentation that looked more promising) was then pursued further, e.g. (DS44; DS45), (DS140; DS141), (DS270; DS271) and (DS300; DS302). In other cases, the first dispute was initiated against a provisional trade barrier by the defendant, and the second dispute was initiated against the definite adoption of the same trade barrier, e.g. (DS314; DS341), (DS101; DS132) and (DS324; DS343).

[25]DS149 and DS279 were initiated with considerable temporal distance (October 1998 and December 2001), and the second concerned the new Indian trade policy as of 2002. Therefore, we treat the as separate. The same applies to DS60 and DS156. Note that the block of disputes (DS236; DS247; DS257; DS264; DS277; DS311) also are distributed over a fairly long period of time (August 2001 - April 2004). However, in the end, they were all resolved at once through a mutually agreed solution between Canada and the United States in September 2006.

B Predictors for Propensity Matching

Against the background of the theoretical literature we estimated a series of models to identify predictors for estimating the propensity score. For transparency reasons we report the results in tables 3 and 4. Table 3 reports models which predict whether a country requests consultations, i.e. becomes a formal complainant at the WTO, or requests the status of a Joining or Third Party in a particular conflict. Table 4 presents models that assess which variables predict whether a country requests a ruling, given that it has requested formal consultations.

Table 3: Predictors for Consultations

	Basic	No EU/U.S. Non-Comp.	No EU/U.S. Comp.	No EU/U.S. Defendants	Sectors	Barriers
GDP C	0.131	0.365	0.121	0.165	0.132	0.129
	(0.031)	(0.040)	(0.048)	(0.072)	(0.032)	(0.032)
GDP D	-0.052	-0.105	-0.082	-0.268	-0.052	-0.050
	(0.029)	(0.033)	(0.034)	(0.079)	(0.029)	(0.030)
Capacity C	-0.045	-0.078	-0.043	-0.051	-0.046	-0.044
	(0.012)	(0.013)	(0.014)	(0.022)	(0.012)	(0.013)
Democracy C	0.053	0.087	0.050	0.056	0.053	0.052
	(0.013)	(0.014)	(0.014)	(0.022)	(0.013)	(0.013)
Agriculture					0.002	
					(0.117)	
Manufacture					0.006	
					(0.137)	
Services					-0.229	
					(0.272)	
AD/CVD						-0.100
						(0.164)
Regulations						-0.089
						(0.167)
Safeguards						0.175
						(0.194)
Subsidies						-0.462
						(0.217)
Various						-0.213
						(0.184)
Constant	-1.546	-3.674	-0.994	0.793	-1.566	-1.459
	(0.592)	(0.678)	(0.735)	(1.219)	(0.611)	(0.617)
Chi2	45.13	141.48	27.14	25.55	45.94	55.34
Pseudo R^2	0.047	0.162	0.040	0.085	0.048	0.058
LL	-455.18	-365.93	-324.05	-138.36	-454.77	-450.07
N	786	679	597	259	786	786

Results are for probit models. Standard errors in parantheses

The choice of predictors follows from previous research on dispute initiations and escalation. For the choice to (co-)initiate a dispute at the WTO or to participate as an observers (Joining or Third Party) only, power and capacity should play an important role (e.g., Busch, Reinhardt and Shaffer, 2009; Sattler and Bernauer, Forthcoming). Similarly, democratic rule is likely to affect the probability of dispute initiation (e.g., Davis and Bermeo, 2009; Sattler and Bernauer, Forthcoming).

The specification in the first column of Table 3 presents the most useful baseline specification to explain the request of consultations. Larger countries tend to participate as formal complainant more often than smaller countries. Similarly, countries are less likely to formally participate in a dispute, the larger the defendant country. In other words, stronger countries tend to litigate more and weaker countries observe more, and strong violators of WTO regulations face fewer formal litigants and more observers instead. Using more explicit power variables that measure dyadic power relations (the relative power as measure by the difference between complainant and defendant size and power asymmetries as measured by the absolute value of relative power) also show statistically significant effects if used separately. However, their effects are less robust than the effect of separate country sizes. We therefore include the latter.[26]

The specifications also include the legal capacity of the potential complainant as measured by the size of the country's delegation in the WTO mission in Geneva. The coefficient on this variable shows that countries with less legal capacity are less likely to initiate formal complaints, and are more likely to participate as observers instead. We also tested whether the legal capacity of the defendant predict assignment to treatment, but the results did not confirm this. This is plausible because the legal capacity of the potential dispute initiator and not of the potential defendant should matter most. Finally, countries are more likely to participate as formal litigants, the more democratic they are. Again, the democracy level of the defendant did not show a statistically significant impact. As additional or alternative relevant variables, we used countries' GDP per capita, their dependence from trade with the potential opponent and retaliatory power of the potential litigant. The impact of these variables was small and/or not robust.[27]

The disproportionate appearance of the EU and the U.S. in WTO dispute as Defendants, Complainants and Joining/Third Parties may have a significant impact on the results. We therefore re-estimate the results and gradually drop the EU and the U.S. as actor in the WTO DSB. The second column presents the results for the basic specification for a dataset without the EU and U.S. as observers (Joining/Third Parties). As we can infer, the results hold and become considerably stronger. This is because the EU and the U.S. often participate as observers although, contrary to the average Joining/Third Party, they are strong and have a highly sophisticated legal machinery. For the specification in the third column, we drop the EU and the U.S. as observers and as formal complainants. For the fourth column, we also drop the EU and the U.S. as defendants. The results are robust to these changes and, with some differences, are quite similar to those in the first column. Finally, we examined if the economic sector or the disputed trade barrier affect the probability of formal litigation, but this is not the case. The excluded category for

[26]It is not possible to include both GPD of C and D and their difference into the same model because of perfect collinearity. Power asymmetry is not robust to the inclusion of other variables.

[27]Trade dependence and retaliatory power is highly correlated with country size, which we include in our models.

the sector dummies is simple manufacturing. The excluded category for trade barrier dummies is tariffs and quota.

Table 4: Predictors for Ruling

	Basic	No EU/U.S. Complainants	No EU/U.S. Defendants	Sectors	Barriers
No. Complainants	0.185	0.149	0.382	0.183	0.171
	(0.057)	(0.060)	(0.168)	(0.058)	(0.064)
GDP C	0.082	0.042	0.112	0.082	0.090
	(0.048)	(0.080)	(0.074)	(0.049)	(0.050)
GDP D	0.146	0.198	0.209	0.147	0.154
	(0.053)	(0.062)	(0.112)	(0.053)	(0.057)
Agriculture				-0.143	
				(0.208)	
Manufacture				-0.114	
				(0.245)	
Services				-0.447	
				(0.461)	
AD/CVD					0.587
					(0.292)
Regulations					0.335
					(0.292)
Safeguards					0.517
					(0.343)
Subsidies					1.482
					(0.487)
Various					1.097
					(0.346)
Constant	-3.664	-3.841	-5.140	-3.558	-4.397
	(1.014)	(1.295)	(1.401)	(1.042)	(1.106)
Chi2	29.82	26.42	21.60	30.98	47.89
Pseudo R^2	0.093	0.126	0.122	0.096	0.149
LL	-145.76	-91.68	-77.44	-145.18	-136.73
N	232	152	130	232	232

Results are for probit models. Standard errors in parantheses

The specification in the first column of Table 4 presents the basic specification to explain the request of a panel ruling given that a country participates as formal complainant in the WTO. The results show that conflicts that attract a greater number of formal complainants are also more likely to proceed to the panel stage. And as before, the sizes of the disputants have a large effect on dispute escalation to the panel stage, but different than before. Among the set of countries that are able and willing to litigate, complainant and defendant size have a positive effect on the probability of a ruling. This means that large countries are less likely to give up after consultations and request a ruling if the outcome of consultations is not satisfactory. Similarly, larger defendants are less likely to give in on the consultation stage, which forces the complainant to ask for support from a panel.

The second and third columns again examine the sensitivity of the results with respect to EU/U.S. participation. Without these actors as complainants and defendants, we get largely similar results. We again examined the effect of other variables reflecting power, legal capacity etc., but they did not have a statistically significant or robust effect. Finally, we examined the role of economic sectors and disputed trade barriers. While the sector does not play a major role, we find that the probability of escalation to the panel stage differs significantly with the type of trade barrier used by the defendant. The excluded category for the sector dummies is simple manufacturing. We exclude the indicator variable for tariffs and quotas.

For the matching procedure, we use the basic model (first column) in Table 3 for the tests of Hypothesis 1 and the model including trade barriers (last column) in Table 4 for the tests of Hypothesis 2.

C Detailed Covariate Balance Results

This section reports detailed pre- and post-matching balance results. We generated matched observations using one-to-one matching with replacement. Table 5 reports standard indicators of balance for our matched sub-sample that we analyze to evaluate hypothesis 1: Standardized means, p-values from a t-test on the difference of means, p-values from a Kolmogorov-Smirnov (K-S) test of similar distributions, and the ratio of the variances of the treated and control samples. The corresponding balance plot can be found in the main body of the paper.

Table 5: Balance Statistics for Matched Subsample (Consultations)

	Control Stand. Mean	Treated Stand. Mean	t-test p-value	Var Ratio $\frac{Tr}{Co}$	K-S-test p-value
lnGDP(C)	8.09	8.19	0.78	0.98	0.54
lnGDP(D)	8.62	8.51	0.70	1.02	0.89
Legal Capacity	2.42	2.34	0.75	1.09	0.61
Pre-consult. sect. trade (m$)	0.38	0.38	0.99	0.99	0.94

Table 6 reports standard indicators of balance for our matched sub-sample that we analyze to evaluate hypothesis 2: Standardized means, p-values from a t-test on the difference of means, p-values from a Kolmogorov-Smirnov (K-S) test of similar distributions, and the ratio of the variances of the treated and control samples. A balance plot can be found in the main body of the paper (see figure 2).

Table 6: Balance Statistics for Matched Subsample: Panel Ruling (Principal and Further Parties)

	Control Stand. Mean	Treated Stand. Mean	t-test p-value	Var Ratio $\frac{Tr}{Co}$	K-S-test p-value
lnGDP(C)	8.78	8.34	0.72	1.12	0.07
lnGDP(D)	9.28	10.00	0.37	0.88	0.00
No. Complainants	1.61	1.08	0.00	5.59	0.01
Pre-panel sect. trade (m$)	0.50	0.42	0.50	2.21	0.27

Table 7 reports standard indicators of balance for our matched sub-sample that we analyze to evaluate hypothesis 3.

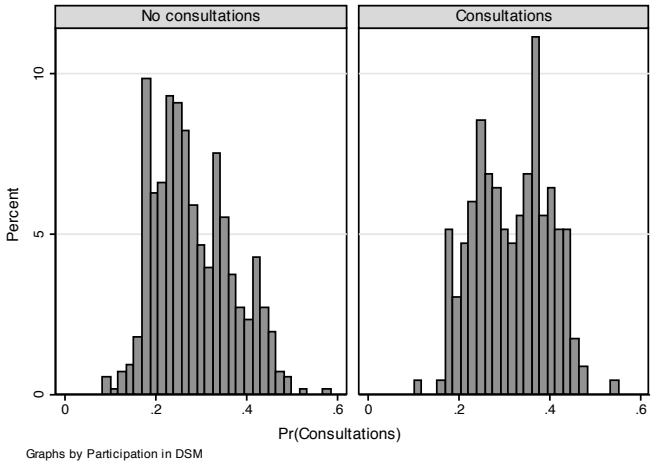
Table 7: Balance Statistics for Matched Subsample: Panel Ruling (Principal and Further Parties)

	Control Stand. Mean	Treated Stand. Mean	t-test p-value	Var Ratio $\frac{Tr}{Co}$	K-S-test p-value
lnGDP(C)	5.83	5.72	0.88	1.04	0.25
lnGDP(D)	9.24	9.04	0.91	1.04	0.00
No. Complainants	1.88	1.11	0.00	5.13	0.03
Pre-panel sect. trade (m$)	0.48	0.32	0.04	5.59	0.00

D Propensity Score Matching Results

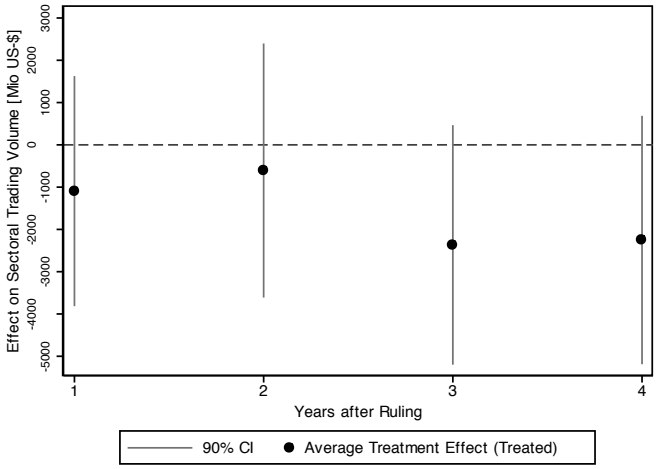
We now present detailed propensity score matching results. We start with distributions of the estimated propensity score in treatment and control groups. These suggest enough overlap between the two distributions.

Figure 7: Distribution of Propensity Score: Consultations



Note: Distribution of predicted probability of consultations, $Pr(Y = 1)$, for treated (left panel) and control disputes (right panel). The control group consists of third party disputes, the treatment group consists of principal party disputes.

Figure 8: The Effect of Consultations on Sectoral Trading Volume – Propensity Score Matching Results

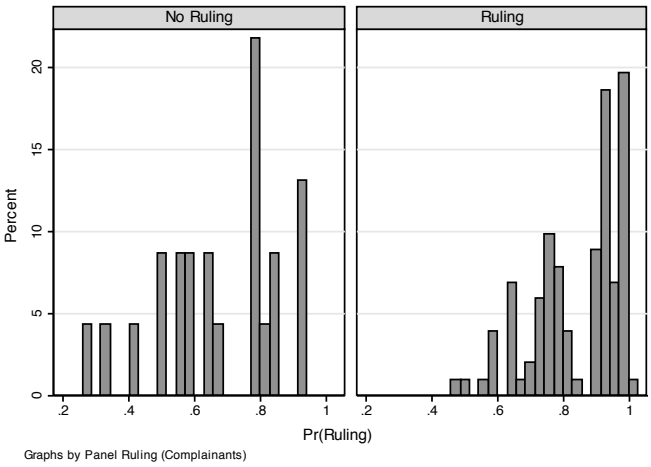


Note: Average treatment effect for the treated (ATT) on trading volume in the sector under dispute. Vertical lines depict 90% confidence intervals.

E Growth in Sectoral Trade Volume as Outcome Variable

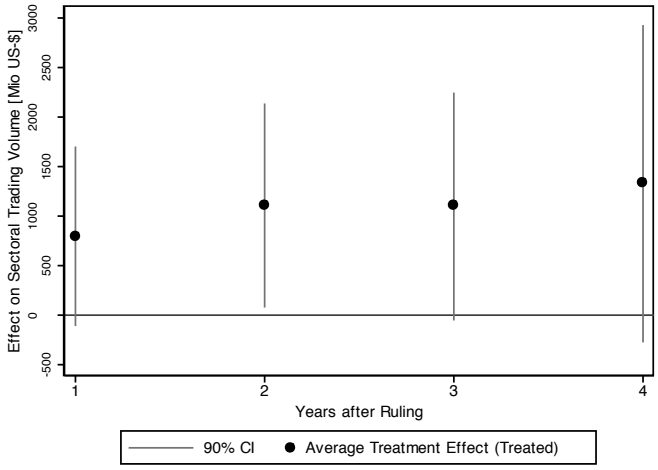
We have reestimated all models using annual growth in sectoral trading volume as outcome variable. We match on pre-consultations / pre-ruling sectoral trade growth.

Figure 9: Distribution of Propensity Score: Panel Ruling (Principal and Further Party Disputes)



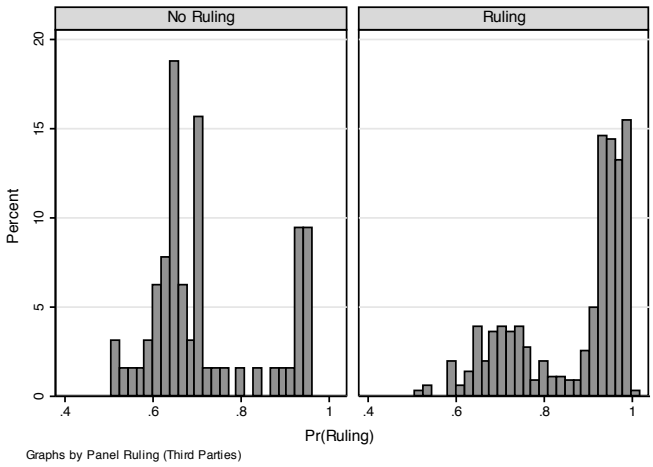
Note: Distribution of predicted probability of ruling, $Pr(Y = 1)$, for treated (left panel) and control disputes (right panel).

Figure 10: The Effect of a Panel Ruling on Sectoral Trading Volume (Principal and Further Party Disputes) – Propensity Score Matching Results



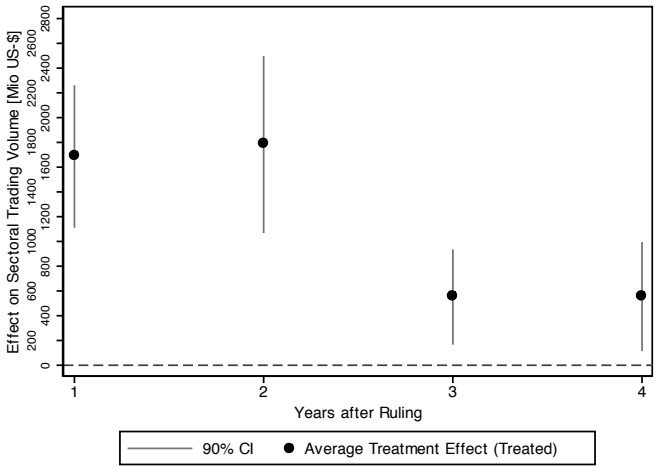
Note: This figure shows the average treatment effect for the treated (ATT) on trading volume in the sector under dispute in the years after consultations have been requested. Results base on propensity score matching (see table **??**, column 5. Vertical lines depict 90% confidence intervals. The control group consists of third party disputes, the treatment group consists of principal party disputes.

Figure 11: Distribution of Propensity Score: Panel Ruling (Third Party Disputes)



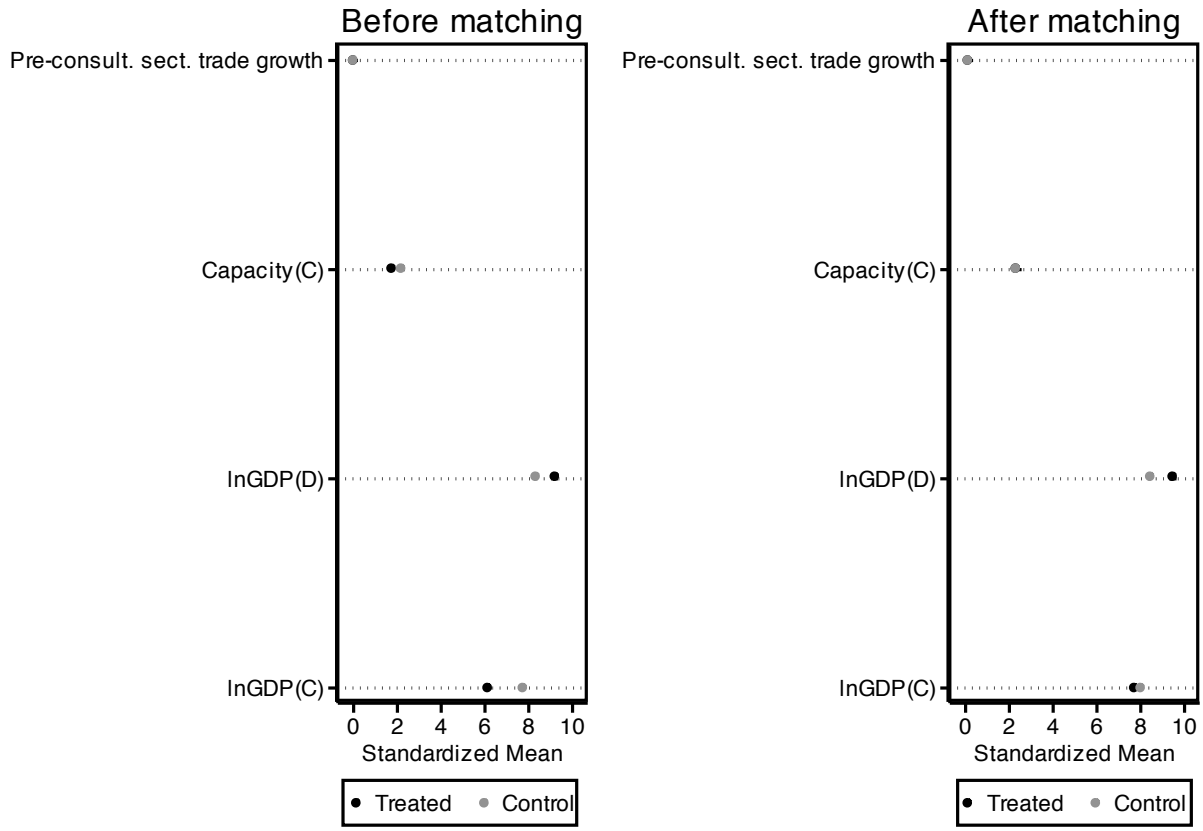
Note: Distribution of predicted probability of consultations, $Pr(Y = 1)$, for treated (left panel) and control disputes (right panel). The control group consists of third party disputes, the treatment group consists of principal party disputes.

Figure 12: The Effect of a Panel Ruling on Sectoral Trading Volume (Third Party Disputes) – Propensity Score Matching Results



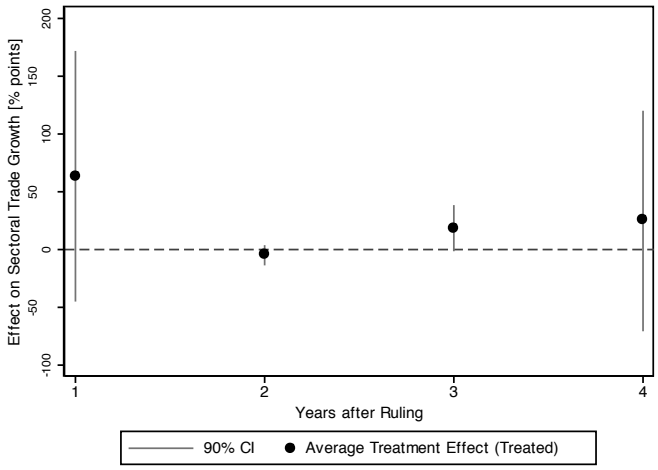
Note: This figure shows the average treatment effect for the treated (ATT) on trading volume in the sector under dispute in the years after consultations have been requested. Results based on propensity score matching (see table **??**,column 5. Vertical lines depict 90% confidence intervals.

Figure 13: Covariate Balance Before and After Matching: Consultations versus No Consultations (Participation) – Growth in Sectoral Trade Volume



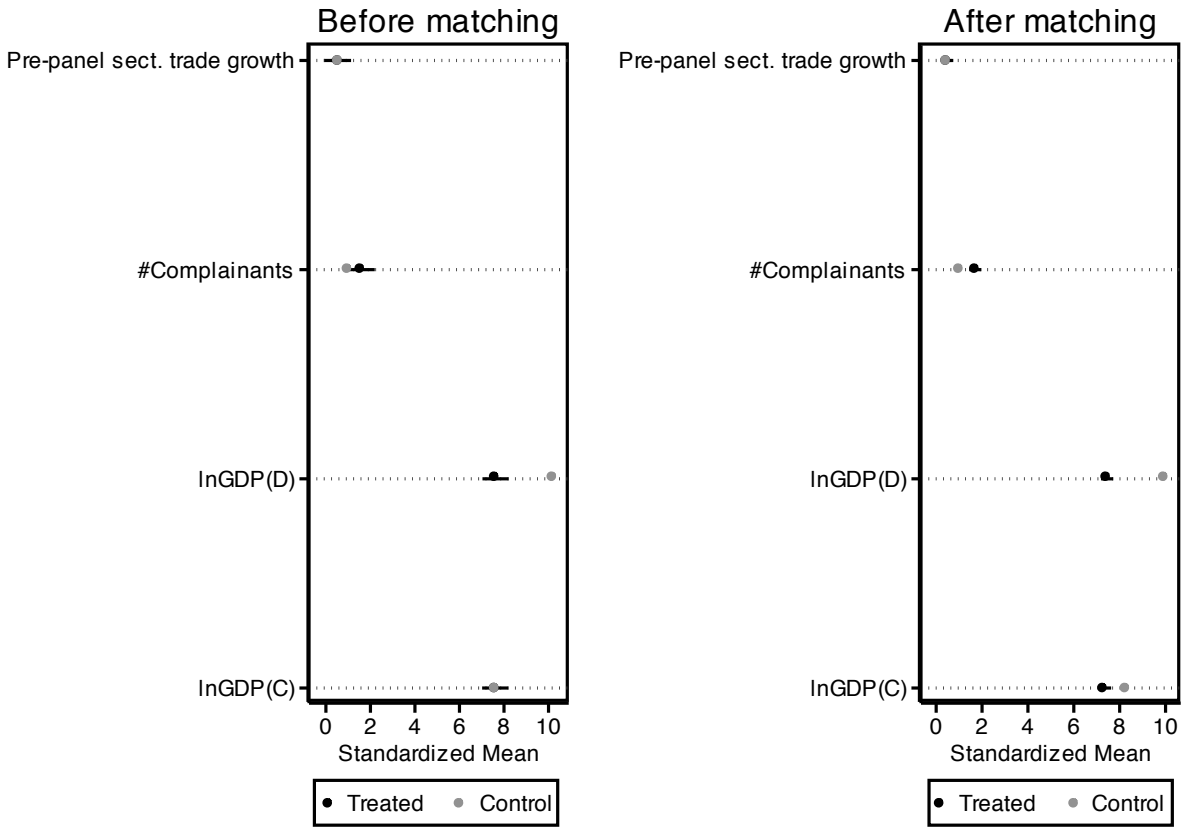
Note: The left panel shows the means of the variables in the treatment and control groups prior to matching, the right panel shows the same quantities after matching. The control group consists of those disputes in which a panel was established, but the dispute ended without a panel ruling. Black horizontal lines depict 99 % confidence intervals.

Figure 14: The Effect of Consultations on Growth in Sectoral Trading Volume (Consultations)



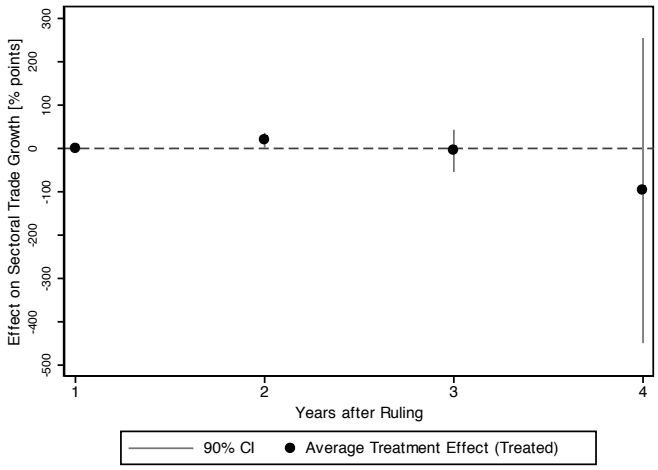
Note: Average treatment effect for the treated (ATT) on trading volume growth in the sector under dispute. Vertical lines depict 90% confidence intervals.

Figure 15: Covariate Balance Before and After Matching: Panel Ruling versus No Ruling (Principal and Further Party Disputes) – Growth in Sectoral Trade Volume



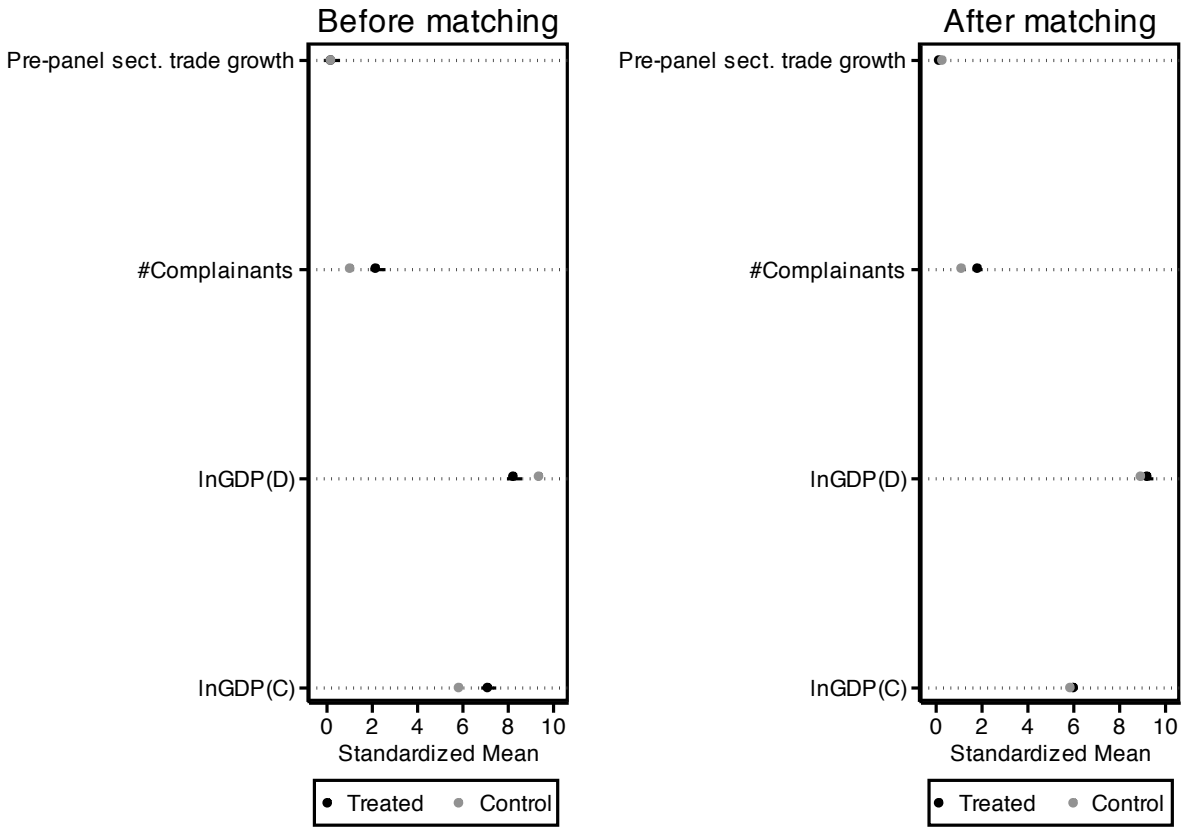
Note: The left panel shows the means of the variables in the treatment and control groups prior to matching, the right panel shows the same quantities after matching. The control group consists of those disputes in which a panel was established, but the dispute ended without a panel ruling. Black horizontal lines depict 99 % confidence intervals.

Figure 16: The Effect of a Panel Ruling on Growth in Sectoral Trading Volume (Principal and Further Party Disputes)



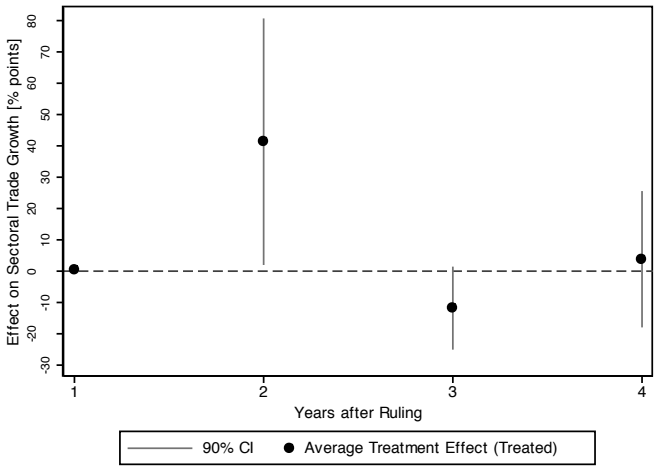
Note: Average treatment effect for the treated (ATT) on trading volume growth in the sector under dispute. Vertical lines depict 90% confidence intervals.

Figure 17: Covariate Balance Before and After Matching: Panel Ruling versus No Ruling (Third Party Disputes) – Growth in Sectoral Trade Volume



Note: The left panel shows the means of the variables in the treatment and control groups prior to matching, the right panel shows the same quantities after matching. The control group consists of those disputes in which a panel was established, but the dispute ended without a panel ruling. Black horizontal lines depict 99 % confidence intervals.

Figure 18: The Effect of a Panel Ruling on Growth in Sectoral Trading Volume (Third Party Disputes)



Note: Average treatment effect for the treated (ATT) on trading volume growth in the sector under dispute. Vertical lines depict 90% confidence intervals.