Overcrowding in WTO Dispute Settlement:
Why Don’t More Countries Join as Third Parties?∗

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Abstract

WTO members that are affected by a trade dispute can join litigation as a third party and gain access to otherwise private negotiations. Participation has a negligible cost, and participants receive larger trade benefits than nonparticipants on average. Yet states most often do not join cases as third parties, even when they have a material interest at stake. We construct a formal model of strategic third party participation in the WTO. Participants receive higher utility from dispute outcomes than nonparticipants, yet the decision to participate raises the total number of third parties, which lowers the likelihood of early settlement. This creates an overcrowding effect: as more states become third parties, the marginal benefit of participation decreases and each state becomes less likely to join. We test our theoretical model by examining each country’s decision to participate or not in every WTO dispute since 1995. The findings offer strong support for our model: states shy away from joining when it’s too crowded.

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1 Introduction

“Nobody goes there anymore; it’s too crowded.” — Yogi Berra.

Dispute settlement at the World Trade Organization (WTO) is widely held to be one of the cornerstones of the international trade regime. Few features of WTO dispute settlement have proven as popular as the creation of third parties. By allowing countries other than the litigants to be present during otherwise private bargaining between complainant and defendant countries, the WTO seeks to prevent discriminatory private settlements, and to increase member participation in dispute settlement.

Third party participation is nearly costless. Countries that join a dispute as a third party, by claiming a substantial interest in the matter at issue, can participate actively in both the bargaining and litigation phases of a dispute without bearing any of the considerable cost of filing a case. For this reason, WTO experts commonly believe that third party participation helps developing country members to gain legal capacity (Busch, Reinhardt and Shaffer, 2009). Evidence also shows that third party participation is effective in changing outcomes. Being in the room during pre-litigation negotiations ensures that a country will not be cut out of a settlement—a “mutually agreeable solution” in WTO parlance—that has a bearing on its trade interests (Elsig and Stucki, 2011).

Discriminatory settlements are proscribed by WTO rules. Yet the nondiscriminatory character of early settlement is difficult to enforce because the exact content of mutually agreeable solutions is rarely observed (Bown, 2009, 54). Third parties thus effectively perform an enforcement function for which there is no clear substitute. The WTO itself touts this as one of the main benefits provided by third parties. The low cost and high effectiveness of third party participation have led to a broad consensus among WTO members over granting third parties even greater powers in

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1See, e.g.: http://www.wto.org/english/docs_e/legal_e/ursum_e.htm#Understanding
2See Article 3.5 of the Dispute Settlement Understanding (DSU).
3http://www.wto.org/english/tratop_e/dispu_e/disp_settlement_cbt_e/c662p2_e.htm
the near future. Third parties, an already important part of dispute settlement, are only likely to gain in importance.

Yet given the extolled benefits of third party participation and its low cost, it is striking how few countries ultimately decide to join cases. The average case has only two third parties. We estimate that if we account for countries’ material interest in the trade barriers at issue, then cases should draw an average of over 17 third party participants. Why would countries not want to join a case that has even a remote bearing on their interests? Participation allows them to observe and affect bargaining solutions that could nullify their benefits and would otherwise remain private without paying any of the costs borne by the complainant. Legal scholars often concede their own surprise at this discrepancy. Why don’t more countries participate as third parties?

Previous explanations have centered on countries’ fear of angering the defendant. Bown (2005) argues that countries are less likely to become third parties if they are vulnerable to retaliation by the defendant. Elsig and Stucki (2011) argue that third party participation becomes less likely as a country grows more dependent on aid from the defendant country. Both of these arguments are extensions of existing theories about why complainants initiate cases. They make no distinction between the drivers of participation as a third party and as a complainant. By contrast, we focus on the defining features of third party participation. Namely, third parties are able to receive private benefits from pre-litigation negotiations, but do not bear the costs of litigation. In this sense, third parties free-ride on the complainant’s litigation efforts.

We construct a theory of third party participation that distinguishes between two types of benefits. The first is a private benefit that is received by only those countries that are present in private negotiations. This can take the form of a discriminatory settlement or a transfer through a

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4 The proposal, which has made it into the Chairman’s text, is to automatically grant third parties the privileges heretofore associated with “enhanced” third party status, which previously required the approval of the panel and was often denied. WTO Document TN/DS/25, Special Session of the Dispute Settlement Body, 21 April 2011.
5 We use trade flows across WTO members in the products at issue in every WTO dispute to generate this expectation. See Section 4.2 below.
6 “So far, third party participation in consultations is less than the author expected” (Horlick 1998: 690).
technical assistance program. The second is a public concession that benefits all WTO members, regardless of whether they participate in private negotiations. Liberalization that generates a benefit for all trading partners via the Most Favored Nation (MFN) principle would fall in this category. Common sense would suggest that all states with trade at stake in a dispute should want to join as third parties. An affected state will benefit from the public concession regardless of whether it participates, and third party participation will increase the likelihood that a state will receive an additional private benefit at no additional cost.

However, we argue that the presence of third parties changes the dynamics of negotiations between the complainant and the defendant. Both the size of public concessions and the likelihood of settlement are endogenous to the number of third parties. By joining a case, a state opens the door to receiving private benefits. However, it also lowers the likelihood that the defendant will grant any private benefits or public concessions whatsoever, and increases the likelihood of a trial. This latter claim is already well-supported in the existing empirical literature (Busch and Reinhardt 2006; Johns and Pelc 2011; Busch 2010).

A nonlitigant must carefully balance these effects when deciding whether to join a case as a third party. We argue that this balancing act creates interdependence in nonlitigant decision-making. If we hold the number of third parties constant, then participants will receive higher payoffs than nonparticipants. However, as the number of third parties increases, the marginal benefit of participation—which changes bargaining outcomes—declines. As a result, we argue that the likelihood that an individual nonlitigant joins as a third party is decreasing in the number of other states that decide to join as third parties. In other words, we expect an overcrowding effect. As more states join as third parties, the marginal benefit of participation decreases and each state becomes less likely to join.

We test our model on a dataset consisting of every WTO member’s decision to join, or not, in
every dispute since the WTO’s inception in 1995. We first show that participants do indeed fare better than nonparticipants. We then model each country’s decision to participate as conditional on every other country’s decision. To identify our model, we instrument for each country’s propensity to join using their export interest in the dispute, as measured by their share of the defendant’s market for the product at issue. The findings provide strong support for our model. States shy away from joining a case when it is too crowded.

The question of participation looms large in multilateral organizations. Observers often point out that despite nearly universal membership, poor countries have severely limited access to dispute settlement (Busch, Reinhardt and Shaffer 2009). These countries are unlikely to file cases because they lack legal expertise and because the final recourse of the Dispute Settlement Understanding (DSU) is retaliation, which is all but off limits to poor countries. The WTO has attempted to address this shortcoming through, among other mechanisms, the creation of third parties. Yet countries rarely join cases despite the low cost of third party participation and its effectiveness in changing outcomes. We argue that this is because of a rational calculation over the net effect of their presence in private negotiations. Prior work on third party participation has failed to account for the impact of third parties on the bargaining behavior of litigants. When we do so, the true costs and benefits of third party participation become clear.

A second implication of our findings relates to the impact of third parties on the probability of early settlement. Many observers have expressed concern that the presence of third parties can increase the likelihood of pre-litigation bargaining failure (Porges 2003; Busch and Reinhardt 2006). However, our analysis shows that these fears may have been overstated. Nonlitigants internalize the impact of their participation on the likelihood of bargaining failure when they choose whether to join as third parties. Countries have an incentive to avoid overcrowding, even though participants do better, on average, than nonparticipants.
2 Third Party Participation in WTO Dispute Settlement

2.1 Overview of WTO Dispute Settlement

Dispute settlement at the WTO is decentralized. The institution itself does not enforce potential violations of its rules, but only provides information about the behavior of its members. It is up to individual states to challenge perceived violations that may negatively affect their interests. As such, the good functioning of the institution requires WTO members to make repeated decisions about whether to file a dispute, whether to become a third party to a dispute initiated by others, or whether to completely refrain from involvement in a given dispute.

Complainants can launch a dispute by filing a request for consultations in one of two ways. They can do so under either GATT Article XXII:1 or Article XXIII:1.\footnote{As the WTO itself instructs potential litigants: “the choice between Articles [XXII and XXIII] is a strategic one, depending on whether the complainant wants to make it possible for other Members to participate.” Indeed, the “main difference between these two legal bases relates to the ability of other WTO Members to join as third parties” (WTO 2011). Article XXII makes third party participation easy, while Article XXIII is traditionally invoked to conduct consultations in private (Davey and Porges 1998).} After a case is filed, nonlitigants must decide how to respond. A nonlitigant can file a parallel case, become a co-complainant to the dispute, and share in the costs of litigation. However, it is far more common for a nonlitigant to join as a third party by invoking a substantial trade interest in the dispute. Strictly speaking, third parties can be pro-complainant, pro-defendant, or mixed in their policy preferences. We focus on the behavior of pro-complainant third parties for two reasons. First, the vast majority of third parties in WTO disputes are pro-complainant—over 70% of third

\footnote{\textsuperscript{7}Cases filed under all other covered agreements similarly require the complainant to invoke one of these two articles through their corresponding consultation provisions: Agreement on Agriculture, Article 19; Agreement on the Application of Sanitary and Phytosanitary Measures, paragraph 1 of Article 11; Agreement on Textiles and Clothing, paragraph 4 of Article 8; Agreement on Technical Barriers to Trade, paragraph 1 of Article 14; Agreement on Trade-Related Investment Measures, Article 8, etc.}

\footnote{\textsuperscript{8}We control for this distinction in our empirical analysis.}
parties in our sample. Second, the existing literature about third party participation (which is discussed below) has also focused exclusively on pro-complainant third parties.

A defendant has the right to block third party participation in WTO proceedings. However, in practice they almost never do so, with only a handful of blocks by the defendant in the first years of the WTO (Davey and Porges 1998). This is easily explained. If a defendant blocks a potential third party, then this state has incentive to file its own parallel case against the defendant. This would be far costlier for the defendant than having that country present as a third party. Additionally, even if a defendant blocks participation by a country that lacks the resources to file its own case, this country could still gain third party status at the panel stage under Article 10 of the DSU.

After filing and participation decisions are made, consultations begin. These are private negotiations among the complainant, defendant, and third parties with the goal of reaching a “mutually agreeable solution.” The WTO explicitly encourages such settlement as its preferred alternative to litigation. Private settlements also benefit the litigants. The defendant can avoid the normative impact of an adverse ruling, and the litigants can reach an agreement away from domestic interest group pressure. As a result, 63% of the disputes in our sample never make it to a panel ruling. If the states are unable to reach a settlement during consultations, the complainant can request the formation of a panel. At this point, the barrier to entry for third parties is made even lower, as non-litigants need only claim a “substantial interest” in the matter, as per Article 10 of the DSU, rather than the “substantial trade interest” requirement under Article 4.11. However, very few countries wait this late in the process to join because one of the key benefits of third party participation is the ability to be present during otherwise private pre-litigation negotiations. We

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9 This risk is explicitly stated in DSU Article 4.11: “If the request to be joined in the consultations is not accepted, the applicant Member shall be free to request consultations.”

10 As per Article 3.7 of the DSU: “the first objective . . . is to secure the withdrawal of the measures concerned if these are found to be inconsistent” with covered agreements. Further, in Article 22.1: “ neither compensation nor the suspension of concessions or obligations is preferred to full implementation of a recommendation.”
can point to only five instances where a country joined as a third party at the panel stage without already having done so at the start of consultations.\footnote{See Busch and Reinhardt (2006) for a brief discussion of four of these cases.}

### 2.2 Why Participate?

An established literature examines who initiates WTO disputes against whom (Davis and Bermeo, 2009; Bown, 2009, 2005; Busch and Reinhardt, 2003). The central premise of this work is that countries do not legally pursue all suspected violations. They make strategic decisions about which cases to initiate. Controlling for the legal merit of a case, states are more likely to initiate cases: the greater their past experience with dispute settlement; the greater the size of their economy; the greater the value of trade at issue; and the more significant their retaliatory capacity against the defendant. Conversely, states are less likely to initiate cases if they are economically dependent on the defendant or have a preferential trade agreement with the defendant (Davis and Bermeo, 2009; Busch, Reinhardt and Shaffer, 2009).

Existing explanations of third party participation have largely emerged out of these earlier arguments about who initiates disputes as a complainant. Just as potential claimants are less likely to file a dispute if they are vulnerable to retaliation by the defendant, it is often argued that countries will be less likely to join as third parties if they are wary of angering the defendant (Elsig and Stucki, 2011; Bown, 2005).

Concerns about reprisals by defendants are highly plausible. However, we focus on an alternative explanation for two major reasons. First, these models of third party participation—which are derived from existing theories of dispute initiation—ignore the key distinguishing feature of third parties. Namely, third parties are allowed to be present during otherwise private bargaining without bearing the costs of litigation. Second, if third party nonparticipation is motivated primarily by fears of retaliation, then we would expect to see cascade effects, rather than overcrowding, in
participation. Suppose that the fear of angering the defendant is the main factor driving third party nonparticipation. As with other alliances—both in the security and economic realms—the cost of standing up to a powerful actor in WTO dispute settlement should go down as the number of parties with whom to share the burden of doing so goes up. The defendant cannot exact retribution costlessly. So if fear of such retribution is the main impediment to participation as a third party, then we would expect there to be “strength in numbers.” If many countries join as third parties, then the cost of also doing so—in terms of angering the defendant—is smaller than if a country were the only third party in the room. This would lead us to expect a cascade effect, where one country’s likelihood of joining is increasing in the number of other countries that join. This goes against the hypothesis of our theoretical model, allowing us to evaluate these expectations against one another in our empirical analysis.

2.3 Public Concessions and Private Benefits

Settlements can benefit nonparticipants if the defendant’s concessions are extended to all WTO members under the MFN principle. For example, suppose that a defendant is accused of subsidizing a domestic industry in a way that violates the Agreement on Subsidies and Countervailing Measures. If the defendant agrees to withdraw the offending measure, then all WTO members with trade at stake benefit from the concession, regardless of whether they participated as third parties. Such settlements provide a public concession because all nonlitigants benefit, regardless of whether they participated in private negotiations.

Consider a recent case brought by the U.S. against Japan over import restrictions on apples. After the case was filed by the U.S., a New Zealand apple grower proclaimed: “The Americans will now sit down to negotiate a protocol with the Japanese and we will hope to piggy-back on that” [Sydney, 2003]. In other words, if a defendant extends concessions to all Members under the
MFN principle, then a mutually agreeable solution generates a public concession. This means that nonlitigants free-ride on the complainant’s enforcement efforts because they receive public benefits but do not pay the costs of litigation.

Privacy during consultations might increase the likelihood of mutually agreeable solutions because politicians will be shielded from industry pressure and temptations to posture (Stasavage, 2004). This unquestionably benefits the membership as a whole. However, privacy also generates the risk of discriminatory settlements, which provide private benefits to the litigants at the expense of other Members. The WTO requires that all mutually agreeable solutions “shall be consistent with [WTO] agreements and shall not nullify or impair benefits accruing to any Member under those agreements, nor impede the attainment of any objective of those agreements.” Yet just as with negotiated grey-area measures such as voluntary export restraints (Lee, 2002), violations of WTO rules that are the result of agreement between two parties bargaining informally are difficult to monitor and enforce. This is especially true when the details of the mutually agreeable solutions, as in the case of consultations, are kept private.

It is difficult to assess how pervasive discriminatory solutions are during consultations precisely because they are kept private. Yet it is a telling sign of their likely pervasiveness that we can observe discriminatory settlements being reached even in publicly-notified solutions. Consider the recent deal reached in a much-publicized dispute, U.S.—Cotton, that was initiated by Brazil against American cotton subsidies. In this deal the U.S. did not remove the offending measures, but instead established a fund for “technical assistance” to foreign farmers in the amount of $147.3 million a year, which Brazil accepted. There was little disagreement on either side of the dispute as to what this deal amounted to. As U.S. Congressman Jeff Flake of Arizona summed up the result: “[w]e want to pay Brazil almost $150 million a year so that we can continue subsidizing U.S. cotton—only in Washington could this pass for logic.” Along these lines, U.S. Congressman

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12 DSU Article 3.5.
Barney Frank of Massachusetts, claimed: “the Obama administration apparently feels compelled to preserve our right to subsidize American cotton farmers by extending that subsidy to Brazilian cotton farmers.”\textsuperscript{13} The \textit{U.S.—Cotton} case shows that litigants are sometimes able to skirt rules that explicitly prohibit discriminatory settlements, even in well-publicized settlements, and provide private benefits.

Third parties are seen as a partial solution to this concern. By letting interested nonlitigants into the room, discriminatory deals reached in private become less likely \textsuperscript{13} \textsuperscript{14}. Third parties have a chance at sharing in bargains reached in private. If all countries that have trade at stake in the dispute are in the room during negotiations, then fear of discriminatory settlements is dampened.

In the \textit{U.S.—Cotton} case, the disputants were two large economies and the third parties were poor African cotton producers. The power asymmetry between Brazil and its third party supporters might suggest that these third parties had little hope of benefitting from a discriminatory settlement. However, there was talk of the U.S. extending its technical assistance to “countries of sub-Saharan Africa that joined Brazil in the case.”\textsuperscript{14} Brazil met with the African country representatives following the deal to discuss the means by which part of the technical assistance fund would go to joint projects with the African countries. By joining as third parties, even poor nonlitigants have a chance at capturing private benefits, which are not extended to the membership as a whole, but only to those countries present in private negotiations.

\subsection*{2.4 Third Parties as Insurance}

The final element to consider is how third party participation affects the payoffs of the complainant and the defendant. Here we build on previous work arguing that third party participation generates

insurance for disputants in the WTO (Johns and Pelc, 2011). Suppose that the disputants reach an early settlement. From the defendant’s perspective, third party participation is beneficial if an early settlement is reached. If third parties are excluded, then defendants are susceptible to subsequent challenges by affected countries not present during negotiations. Moreover, such future challenges are likely to be strengthened by precedents set in the initial case, an outcome that leaves defendants worse off. This is why defendants almost never block third party participation despite having the legal ability to do so. Defendants would rather allow a third party in the room than have that third party file a complaint of its own. From their point of view, an extra third party can never increase the odds of future litigation on the underlying issue, and may decrease them. All things equal, if early settlement occurs, then defendants can only benefit from additional third party participation.

However, third party participation is costly for the complainant if an early settlement is reached. Having an additional third party in the negotiations can only reduce the complainant’s share of compensation—through either public concessions or private benefits—and never increase it. There will always be an upper limit on the willingness of a defendant to change its behavior in order to avoid litigation. Having more states involved in negotiations means that, all things equal, more states must share the spoils of any settlement.

Suppose that states cannot reach an early settlement and the panel issues a ruling on the case. Despite its elaborate dispute settlement procedures, the WTO remains a fundamentally diplomatic institution. While panel rulings are considered to be legally binding, member perceptions shape the normative impact of rulings. In the complete absence of third parties, panel rulings are interpreted in a purely legalistic fashion, benefiting the winner and harming the loser. When a third party joins a case, it usually brings its own set of opinions and preferences to the economic and legal questions at stake. Even if a third party is staunchly pro-complainant, it may differ in its justifications
for opposing the defendant’s policies. This diversity can move purely legalistic and narrow panel rulings into the diplomatic realm. Broad third party participation—registered as oral and written submissions in the panel report—often suggests that a legal issue is ambiguous or subject to competing interpretations. The overall effect is that third parties can soften losses and render wins more ambiguous. To be sure, WTO disputants always prefer winning to losing, regardless of the level of third party participation. However, more third parties can discount both the benefits of winning and the costs of losing—lowering the winner’s payoff and raising the loser’s payoff—when compared against a case in which no third party views are expressed.

The combined impact of third parties on both early settlement and panel rulings generates an “insurance” effect. If there is early settlement, then a large number of third parties decreases the complainant’s payoff—since the settlement must be shared—while increasing the payoff to the defendant—since third parties will be deterred from filing disputes of their own. In contrast, if there is a panel ruling, then having lots of third party involvement will help the loser and harm the winner by introducing ambiguity into the ruling. The overall impact of third party participation is to reduce risk. Third parties act as insurance for disputants, generating a cost in the case of success, and a benefit in the case of failure.

3 Theory

3.1 Model

We assume that two states, a complainant and a defendant, are involved in a trade dispute. The defendant has previously taken some action that has caused harm to the complainant. The defendant’s action has also impacted other interested states, which we refer to as “nonlitigants.” For example, US cotton subsidies harmed both Brazil, the complainant in U.S.—Cotton, and the many other countries that also grow cotton. We would refer to the latter group of countries as
“nonlitigants” because they were affected by the outcome of the dispute but did not become co-complainants. Some of these nonlitigants decide to join as third parties; others do not. We refer to the former group as “participants” and to the latter group as “nonparticipants.”

As shown in Figure 1, the game begins when Nature chooses the strength of the complainant’s case, $\pi$. This corresponds to the probability that the complainant wins the panel ruling if the litigants are unable to reach an early settlement. It is revealed to the complainant and the nonlitigants. The defendant is uncertain about the strength of the complainant’s case. Each nonlitigant can then choose whether to participate by joining as a third party to the case. We denote the number of nonlitigants that decide to join the case by the endogenous parameter $a$. After participation decisions are made, the complainant demands a public concession, which we express as a share, $x \in [0, 1]$, of the total value of the dispute. For example, the total value of the dispute in U.S.—Cotton was the total benefit—be it economic and/or political—that the US received from subsidizing cotton farmers. Any reduction in these subsidies would be a public concession to all other cotton producers and would lead to the US losing a share of the economic and/or political benefits of subsidization. If the defendant accepts the demand, then there is early settlement of the dispute. If the defendant rejects the demand, then the case is heard and ruled on by the panel. The complainant wins the panel ruling with probability $\pi$, and the defendant wins with probability $1 - \pi$.

We begin by examining the payoffs of the complainant and the defendant, which are shown

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15 Note that we implicitly ignore those states that are WTO members but are not affected by the outcome of the dispute. We consider them to be outside of the realm of relevant actors for a given dispute.

16 Details about the distribution of $\pi$ are included in the Appendix.

17 Our model does not rely upon the assumption of asymmetric information. All results continue to hold if we assume that all players know the value of $\pi$. We present the model with asymmetric information since we believe that most readers will find this more plausible than a model of complete information.

18 This is a reasonable way to represent the scope of public concessions since the complainant will never make concessions to the defendant (i.e. offer less than zero), and the defendant will never agree to concessions that exceed the value of the contested policies.
The value of the dispute is denoted by parameter $V > 0$. Larger public concessions, $x$, increase the payoff of the complainant and decrease the payoff of the defendant. The number of third parties, $a$, also affects payoffs by generating insurance for disputants. Having more third parties helps the complainant if she loses the panel ruling, but harms her if there is early settlement or if she wins the ruling. Third parties have the opposite effect on the defendant’s payoffs. A larger number of third parties helps the defendant if there is early settlement or if the complainant wins the ruling, but harms the defendant if he wins the ruling. Both players must pay the cost of litigation, $k > 0$, if the case is heard by the panel.

While the preferences of the nonlitigants are closely aligned with those of the complainant, their payoffs differ slightly. All nonlitigants prefer larger public concessions, $x$, by the defendant. Yet participation has its benefits. If a nonlitigant participates in the case and an early settlement is reached, then she receives a private benefit, which we denote by parameter $b > 0$.\textsuperscript{19} We assume that nonlitigants pay no cost of litigation, regardless of whether they participate as third parties.\textsuperscript{20} We restrict attention to the fully separating weak perfect Bayesian equilibrium.\textsuperscript{21}

### 3.2 Bargaining and Settlement Behavior

We begin by examining the behavior of the complainant and defendant after nonlitigants have made their participation decisions. At this point in the game, both the complainant and the defendant know how many states have joined as third parties.

\textsuperscript{19}For now, we treat this as an exogenous parameter of the model.

\textsuperscript{20}Our model would not be particularly illuminating if it were to show that nonlitigants refuse to join cases because litigation is costly for them. By assuming that there is no litigation cost for nonparticipants, our model highlights an alternative mechanism that would otherwise be obscured: the impact of participation decisions on endogenous bargaining and settlement outcomes. Nonetheless, all model results are robust to the inclusion of a small trial cost for participants. Results are available upon request from the authors.

\textsuperscript{21}As discussed in the Appendix, we assume that off-the-equilibrium-path beliefs satisfy the refinement of universal divinity (Banks and Sobel 1987). In order for the fully separating equilibrium to exist, $k$ must be small relative to other parameters in the model.
Proposition 1. \textit{In equilibrium, the complainant’s demand is increasing in the strength of her case and the number of third parties, and larger demands are less likely to be accepted by the defendant.}

In equilibrium, the complainant’s demand is always strictly increasing in the strength of her case. The more likely she is to prevail in panel proceedings, the more she demands in pre-litigation negotiations. The defendant can always infer the strength of the complainant’s case based upon the size of her demand. That is, after hearing the complainant’s demand, the defendant is no longer uncertain about the probability that the disputant will prevail in panel proceedings.

Additionally, a larger number of third parties increases the complainant’s demand. Recall that litigation is stochastic: even if the defendant knows the strength of the complainant’s case, he does not know for sure whether he will win or lose a panel ruling. A larger number of third parties increases the defendant’s utility from early settlement. However, third parties have an ambiguous effect on his expected utility from trial: third parties help if he loses and harm if he wins. The overall impact of an increase in the number of third parties is to increase the desirability of early settlement relative to a trial. This means that the complainant makes larger demands.

Intuition might suggest that the defendant should be more likely to accept larger demands because he knows they are being chosen by stronger types. However, the opposite effect must hold in order for an equilibrium to exist: larger demands must be accepted with a lower probability (Gilligan, Johns and Rosendorff \citeyear{Gilligan2010}; Johns and Pelc \citeyear{Johns2011}). To understand why this must be true, suppose that large demands are more likely to be accepted. Then a complainant who has a weak case has incentive to bluff by making larger demands. By asking for more, she would be more likely to receive this large settlement and less likely to go through litigation, which she believes she will lose. All players would have incentive to pretend as though they are stronger than they really are. Separation would not be possible since all types would want to make larger and larger demands. In contrast, if larger demands are less likely to be accepted, then the implicit threat of
litigation disciplines the complainant’s demands in pre-litigation negotiations. Weak types do not have incentive to mimic the demands of stronger types because they know that this behavior is more likely to result in panel proceedings, which weak types want to avoid. In equilibrium, larger demands are less likely to be accepted by the defendant.

3.3 Participation Behavior

We can now consider the incentives of nonlitigants to participate as third parties. We begin with a claim that is implicit in the payoff structure of our model.

**Claim 1.** Controlling for the number of third parties, participants receive a higher expected utility than nonparticipants.

Recall that in our model, all nonlitigants receive public concessions. However, only participants receive private benefits if there is early settlement of the dispute. Nonparticipants are not able to receive these private benefits because they are excluded from pre-litigation negotiations. This means that if we hold the number of third parties constant (and hence hold equilibrium demands and the probability of settlement constant), participants always receive a higher expected utility than nonparticipants. At first glance, this suggests that all nonlitigants should want to join as third parties: an affected state will benefit from the public concession regardless of whether it participates, and third party participation will increase the likelihood that a state receives the additional private benefit, at no additional cost. However, this logic ignores the strategic impact of participation decisions on bargaining and settlement behavior.

When an individual nonlitigant contemplates whether to join a case as a third party, he recognizes that his decision will change the total number of third parties. This will in turn change both bargaining and settlement behavior. If we want to think systematically about the incentives of nonlitigants, we cannot hold the number of third parties constant. We must compare the expected
utility of participation and nonparticipation given that the individual’s decision will change the number of third parties.

It is not immediately clear how these participation decisions should be modeled. In the real world, these decisions are not made simultaneously. States are able to observe the choices of others when deciding whether to participate. However, there is no institutional structure that determines the order in which states make participation decisions. Rather than imposing an arbitrary extensive game form, we adopt a more general perspective by examining the best response functions of nonlitigants. That is, we examine how the incentives of a nonlitigant to participate change as a function of the expected behavior of other states.

To understand strategic participation decisions, we must first understand the impact of case strength on the marginal benefit of joining a case.\(^{22}\)

**Lemma 1.** A nonlitigant’s marginal benefit from participation as a third party is decreasing in the strength of the case.

When a nonlitigant joins a case, he increases the number of third parties. This decision changes three different endogenous variables: the size of public concessions, the probability of a trial, and the nonlitigant’s expected utility if a trial occurs. As argued above, more third parties increases the desirability of settlement relative to trial for the defendant. This is what allows the complainant to demand more in pre-litigation negotiations as the number of third parties grows larger. However, the strength of the plaintiff’s case affects the magnitude of this impact. As a case grows stronger, the defendant becomes less likely to win the panel ruling. This means that more third parties—which help the loser—become more beneficial for the defendant. This limits the ability of the complainant to extract large public concessions. While equilibrium demands are always increasing in the number of third parties, the marginal impact of the number of third parties on public

\(^{22}\)For the next result we assume that the value of the dispute is large. Specific assumptions on parameter values are made explicit in the Appendix.
concessions decreases as cases grow stronger.

Recall that larger demands are more likely to be rejected by the defendant. So an increase in the number of third parties (which increases equilibrium demands) makes settlement less likely. The complainant is able to use the threat of litigation to extract concessions from the defendant during negotiations. These concessions are largely driven by the defendant’s desire to avoid litigation costs. So the utility that would have been burned during litigation (cost $k$) is instead spent on providing the complainant and all nonlitigants with a policy concession. This means that a nonlitigant will always strictly prefer any equilibrium settlement—which provides both a policy concession and a private benefit—to litigation, even though he does not bear the cost of litigation himself. So an increase in the probability of trial lowers the nonlitigant’s overall expected utility from the game, *ceteris paribus*.

Finally, the number of third parties has a non-linear direct effect on the nonlitigant’s expected utility from trial. Third parties serve as insurance during trials: they help the loser and harm the winner. If the complainant has a relatively weak case, then more third parties will increase the nonlitigant’s expected utility from trial. However, as the complainant’s case grows stronger, the benefit of having more third parties declines because the complainant is less likely to lose. If the complainant has a relatively strong case, then third parties are more likely to harm the nonlitigant than they are to help. So the expected utility from trial is decreasing in the number of third parties if the complainant has a strong case.

The combinations of these three effects of the number of third parties—on the size of public concessions, the probability of a trial, and the nonlitigant’s expected utility from trial—ensure that a nonlitigant’s marginal benefit from joining a case declines as a case grows stronger. If the case is very weak, then larger public concessions, access to private benefits, and better trial outcomes outweigh the cost of a decrease in the likelihood of settlement. However, as a case grows stronger
the impact of third parties on public concessions declines, the probability of settlement continues to decline, and more third parties begin to lower the nonlitigant’s expected utility from trial. A nonlitigant is less likely to join as a third party as the strength of the complainant’s case increases.

Figure 2 shows this effect. The strength of the complainant’s case is represented by the horizontal axis, while a nonlitigant’s marginal benefit of participation is shown on the vertical axis. A nonlitigant will only join a case if the marginal benefit from participation is positive. If the marginal benefit is negative, then the nonlitigant will not join as a third party. This marginal benefit is always decreasing in the case strength, regardless of how many other nonlitigants decide to become third parties.

Additionally, Figure 2 shows that regardless of the strength of the complainant’s case, increasing the number of other states that participate as third parties lowers a state’s marginal benefit from joining the case as another third party.

Proposition 2. A nonlitigant’s marginal benefit from participation as a third party is decreasing in the number of other states that join as third parties.

The key benefit of participation as a third party is access to private benefits. However, these benefits are only secured if there is early settlement. Additionally, nonlitigants—both participants and nonparticipants—receive public concessions only if there is an early settlement to the case. Regardless of the strength of the case, having more states involved in negotiations lowers the probability of an early settlement. This means that as more states join as third parties, the marginal benefit of participation declines because participants are less likely to receive both private benefits and public concessions.

\footnote{For the next result we assume that both the value of the dispute and the private benefit are large. Specific assumptions on parameter values are made explicit in the Appendix.}
Of course, we can’t actually observe the strength of a case since this reflects *ex ante* beliefs about panel outcomes. However, the combination of Lemma 1 and Proposition 2 implies that the range of cases for which a nonlitigant wants to participate grows smaller as the number of other third parties grows larger. This shown graphically by the line graphs in the lower half of Figure 2. The empirical implication is an overcrowding effect: the probability that a nonlitigant joins a case as a third party should be decreasing in the number of other states that do so.

4 Empirics

4.1 Data Description

What drives a nonlitigant’s decision to participate as a third party in a WTO dispute? Why do so few countries decide to do so? To answer these questions empirically, we collect data on all disputes initiated since the WTO’s inception in 1995.

We used the Horn and Mavroidis dataset (hosted by the World Bank) to identify the products at issue in each dispute. We then updated this dataset to the present day using WTO requests for consultations posted by complainants, which usually contain a mention of the precise product(s) at issue. These products vary in their level of disaggregation, from two-digit HS products (for disputes challenging a broad barrier) to 10-digit HS products (for disputes challenging a narrower barrier).

For each dispute, we then collect the amount of trade at stake, which we measure as the level of exports for the product at issue, from each nonlitigant country to the defendant’s market. We gather these data using the COMTRADE database accessed through the World Integrated Trade Solution (WITS) hosted by the World Bank. We then use nonlitigant exports to construct two distinct variables. First, we define the variable “Trade Stake” as the absolute logged amount of

24 The most recent dispute in our data is DS423.
exports at stake at $t-1$, the year prior to the dispute’s initiation. Second, we define the variable “Change in Exports” as the logged change in exports over the three years preceding the dispute’s initiation. We expect that nonlitigants will be more likely to participate as a third party in a given dispute, the larger their trade stake and the greater the decrease in exports at issue during the three years preceding the dispute.

In relying on trade data for the identification of our main model, we set aside all “nonmerchandise” disputes, which are cases that do not challenge a barrier over a specific product, but rather a piece of domestic legislation or intellectual property laws. These cases correspond to about a fifth of the WTO caseload. We remove these cases because: (1) nonmerchandise disputes are more likely to loom larger in their impact on case law; and (2) partly for this reason, it becomes unfeasible to assess a country’s ex ante material stake in a nonmerchandise dispute, in the way that we can when dispute are fought over barriers on identifiable products. We are left with 321 WTO disputes for which we have sufficient data to run our estimation.

Additionally, we control for a number of dispute characteristics. Our main control variable is whether the complainant filed under Article XXII (which promotes third parties) or under Article XXII (which prevents third parties). This variable is coded as 1 if the complainant promoted third parties, and 0 otherwise. We expect it to be positively related to the odds of participation.

To tap the conventional wisdom on the drivers of participation, we also add controls for the logged GDP of the defendant, the complainant, and the nonlitigant, and the latter’s logged GDP per capita at $t-1$. To test the hypotheses of Elsig and Stucki (2011) and Bown (2009), we add two controls. First, we code the log of total aid in constant dollars from the defendant to the nonlitigant country as “Aid Dependence.” Second, we follow Bown (2009) in measuring “Retaliatory Capacity” by taking each nonlitigant’s total exports to the defendant’s market, in the year prior to the dispute’s initiation.
As mentioned above, our argument concerns pro-complainant third parties, which represent the great majority of third parties across all WTO disputes. The average number of pro-complainant third parties in our sample is 1.36. We nonetheless control for the presence of pro-defendant or mixed third parties, both because these may be indicators of a dispute with systemic implications for the membership at large, and because they effectively reduce the number of non-litigants “available” for pro-complainant third party participation.

4.2 Participation Has Its Benefits

We begin by assessing a primary assumption of our model. Our theory implicitly assumes that third parties on average fare better than nonparticipants. We argue that all interested nonlitigants can receive public concessions, but only participants can receive additional private benefits. Nonlitigants do not stay out because they think that in so doing they will fare better than third parties. Rather, they decide not to join because they think that their participation will change bargaining outcomes such that even as a third party, they would emerge at a net loss.

To assess this premise, we examine the trade flows of the products at issue in the dispute after its conclusion. These trade flows should capture both the public concession and the private benefit flowing from dispute settlement. We then examine the change in these exports for third party countries in comparison to all nonparticipating members. We effectively ask: how much does participating as a third party increase your access to the defendant’s market (relative to nonparticipation)?

Our unit of observation is the country-product-year. Our sample consists of the trade flows of all countries other than the complainant and defendant in a given dispute for all available years after the end of that dispute. The last year of a dispute corresponds to its last formal WTO event.\footnote{This would be, for instance, the panel report in a case where no litigant filed an appeal, and the complainant}
Our dependant variable in the first set of estimations is the logged level of exports into the defendant’s market for the products at issue. We are interested in the sign of the coefficient for the third party dummy, which is coded as 1 if a given country participated as a third party, and 0 otherwise. We expect this coefficient to be positive. We begin by running a panel regression with dispute fixed effects and robust standard errors clustered on the dispute.

The results are shown in Table 2. In the first two columns, the dependent variable is the logged level of exports to the defendant. The first estimation (Column 1) shows a sparse model that controls only for “Trade Stake”, corresponding to the level of exports at \( t-1 \), and which thus acts as a lagged dependent variable; and the defendant’s logged GDP, since compliance with settlements and rulings may vary in accordance with the defendant’s market power. The second estimation (Column 2) substitutes the dispute fixed effects for defendant fixed effects as a means of accounting for unmeasured features of the defendant that may affect compliance. We also add: the log of the complainant’s market size; a dummy indicating whether the dispute reached a ruling; and a count of the number of pro-complainant third parties in the dispute. In both the first and second estimations, third parties see higher levels of trade following a dispute, controlling for the level of trade prior to the dispute.

[Insert Table 2 here.]

In our third estimation (Column 3), we shift our focus to the growth of exports, rather than their levels. We calculate growth in trade flows as the percent difference between and the year under examination, for all years following the end of the dispute. We keep the right hand side of this third estimation as the first estimation (Column 1), and additionally include the log of the complainant’s GDP. We once again run a panel regression with dispute fixed effects and robust standard errors clustered on the dispute.

We did not request an Article 21.5 compliance panel challenging the defendant’s implementation of the panel’s recommendations.
standard errors clustered on the dispute. Third parties appear to fare better than nonparticipants even when we look at growth rather than export levels.

These tests remain willfully simplistic. Indeed, they ignore this paper’s main argument, which is that third party participation is the result of strategic calculations. Third party participation is treated as exogenous in these estimations. Nonetheless, these tests remain useful in showing that third parties appear to fare better on average than nonparticipants with regard to post-dispute trade flows.

4.3 Testing the Overcrowding Effect

We now move on to our main questions: why don’t more countries join WTO dispute settlement as third parties? Our argument is based on strategic interdependence. This poses an empirical challenge because every country’s decision hinges on that of all others. We expect that the total number of third parties will affect each country’s decision, which, naturally, will in turn affect the total number of third parties.

To address this problem, we employ an instrumental variable approach. We instrument for the total number of third parties by looking to the world’s combined stake in the dispute at issue, excluding the country under examination. Specifically, we code our instrument, which we call rest-of-world (ROW) stake, by summing the exports from all nonlitigants to the defendant, leaving out the state under examination, in the year prior to the start of the dispute. Our instrumental variable meets the requirements of a good instrument. First, it is a powerful predictor of our endogenized variable; that is, the number of nonlitigants that eventually join as third parties. Second, theory supports the exogeneity of this instrument for our purposes. There is no viable rationale for thinking that a given country’s participation as a third party would be directly affected by the stake of the rest of the world in the trade at issue. Indeed, when we regress our instrument on
the other exogenous variables, the partial residuals are uncorrelated with the decision to join as a third party, offering support for the exogeneity of our instrument.

Our results are shown in Table 3. In our first estimation (Column 1), we control for: the country’s own trade stake in the dispute; the change in exports in the three years prior to the start of the dispute; and whether the complainant promoted third party participation by filing the case under Article XXII. In our second estimation (Column 2), we test the effect of retaliatory capacity. Finally, the third estimation (Column 3) includes a set of variables that test existing arguments about the effect of aid dependence and development [Elsig and Stucki 2011; Bown 2009]. If these arguments are correct, we would expect greater aid dependence of nonlitigants on the defendant to reduce their likelihood of joining. Similarly, poorer countries should be less likely to join as third parties if this denotes their greater vulnerability to any type of retaliation by the defendant. We thus add controls for a country’s logged GDP, its logged GDP per capita, and the amount of aid it received from the defendant, all at t-1.

[Insert Table 3 here.]

The findings provide strong support for the overcrowding hypothesis. Across all model specifications, the greater the number of other countries that join as third parties, the lower the likelihood that the given WTO member will join. This effect is substantively strong. In the first specification, if we hold all control variables at their mean (with dummy variables at their mode), then increasing the number of third parties from its sample mean (1.36) by one standard deviation (2.62) reduces the probability that a nonlitigant will join a dispute by almost two-thirds, from 18.7% down to 6.8%.

As expected, if the complainant promotes third parties by filing under Article XXII, this increases the likelihood of a given country joining as a third party. The average impact of Article XXII is just over 7% across our three specifications. We also find support for Bown (2009)’s
contention that retaliatory capacity increases the probability of joining. Variables for a country’s logged GDP per capita and aid dependence, however, are both negatively signed, but neither is significant. Finally, market size is positively correlated with the likelihood of joining, as expected. Overall, these results offer strong support for the overcrowding hypothesis.

5 Conclusion

Third parties are widely celebrated as a key aspect of dispute settlement at the WTO. They are said to increase transparency, allow developing countries to acquire legal capacity, and play a crucial enforcement role by decreasing the likelihood that litigants strike discriminatory settlements at the expense of the remainder of the membership. For the third parties themselves, participation appears equally beneficial: third parties can defend their interests during otherwise private negotiations without paying the high costs of litigation that are shouldered by the complainant. And indeed, we find that third parties fare much better on average than non-participants, judging from the market access they gain as a result of disputes, as measured through subsequent exports. We are thus left with a puzzle: given these extolled benefits, why does the average merchandise dispute count barely more than one third party? Why do more countries not join when they have an observable stake in the matter at hand?

We have argued that participation decisions are strategically interdependent. The decision to participate raises the total number of third parties, which lowers the likelihood of early settlement. This creates an overcrowding effect: as more states become third parties, the marginal benefit of participation decreases and each state becomes less likely to join. We test our theoretical model by examining each country’s decision to participate or not in every WTO dispute since 1995.

Alternative explanations, centering on the costs of angering the defendant, obtain comparatively less support. While there are undoubtedly cases where dependence on aid from the defendant
acted as a deterrent to seeking third party status, these concerns seem to have little impact in the average dispute. By comparison, we do find support for the idea that retaliatory capacity, even when controlling for market size and wealth, increases the odds of third party participation. The most persistent factor of (non)participation, however, appears to be a concern over who else is in the room. The greater the number of other countries that join, the less likely a given country is to join. The empirical findings thus support our theoretical model’s expectations: states shy away from joining when it’s too crowded.
Appendix

Let $x(\pi, a)$ denote a demand made by type $\pi$ given the number of third parties $a$. Let $s(x)$ denote the probability that the defendant settles by accepting demand $x$. We assume that $\pi$ is distributed with full support on the interval $[\pi_L, \pi_H]$ where $0 < \pi_L < \frac{1}{2} < \pi_H < 1$. We also assume that $V > 2a$ for all possible values of $a$ and cost $k > 0$ is small. This ensures that the complainant always prefers winning the panel ruling to losing, and the complainant’s demand is an interior solution. We derive the fully separating equilibrium and assume that off-the-equilibrium-path beliefs satisfy the refinement of universal divinity (Banks and Sobel 1987).

Proof of Proposition 1. Suppose the complainant adopts a fully separating strategy. Then conditional on observing a demand, $x$, the defendant can correctly infer the type of complainant, $\pi$. The defendant will accept the demand if and only if:

$$(1 - x)V + a \geq (1 - \pi)V - a(1 - 2\pi) - k \iff x \leq \pi + \frac{2a(1 - \pi) + k}{V}$$

So the optimal demand is:

$$x^*(\pi, a) = \pi + \frac{2a(1 - \pi) + k}{V} \quad (1)$$

Note that $x^*(\pi, a) \geq 0$ always and $x^*(\pi, a) \leq 1 \iff k \leq (1 - \pi)(V - 2a)$. Let $T_C(\pi, a)$ denote the complainant’s expected utility from trial. Then the complainant’s expected utility from demand $x$ is:

$$EU_C(x|\pi, a) = s(x)(xV - a) + [1 - s(x)]T_C(\pi, a)$$

$$\Rightarrow \quad \frac{\partial EU_C(x|\pi, a)}{\partial x} = s(x)V + s'(x)(xV - a) - s'(x)T_C(\pi, a) = 0$$

$$\iff x = \frac{T_C(\pi, a) + a}{V} - \frac{s(x)}{s'(x)} \quad (2)$$

Combining conditions (1) and (2) means that:

$$\pi + \frac{2a(1 - \pi) + k}{V} = \frac{T_C(\pi, a) + a}{V} - \frac{s(x)}{s'(x)}$$

$$\iff \left(\frac{2k}{V}\right)s'(x) = -s(x)$$

$$\Rightarrow s(x) = \exp\left(\frac{-xV}{2k}\right)$$

Note that $s(x) \in [0, 1]$ for all $x \in [0, 1]$. So the settlement function yields a well-defined probability for all possible demands. Universal divinity ensures that if the defendant observes an off-the-equilibrium path demand $x > \max\{x^*(\pi, a)\}$, then she rejects the demand. Similarly, if she observes an off-the-equilibrium path demand $x < \min\{x^*(\pi, a)\}$, then she accepts. So we have the
following equilibrium behavior:

\[ x^*(\pi, a) = \pi + \frac{2a(1 - \pi) + k}{V} \]

\[ s^*(x) = \begin{cases} 
1 & \text{if } x < \min \{x^*(\pi, a)\} \\
\exp \left( -\frac{xV}{2k} \right) & \text{if } x \in \left[\min \{x^*(\pi, a)\}, \max \{x^*(\pi, a)\}\right] \\
0 & \text{if } x > \max \{x^*(\pi, a)\} 
\end{cases} \]

It is easy to see that:

\[ \frac{\partial x^*(\pi, a)}{\partial \pi} = 1 - \frac{2a}{V} > 0 \]

\[ \frac{\partial s^*(x)}{\partial x} = -\exp \left( -\frac{xV}{2k} \right) \left( \frac{V}{2k} \right) < 0 \]

and: \( x^*(\pi, a') - x^*(\pi, a) = \frac{2(a' - a)(1 - \pi)}{V} > 0 \) if and only if \( a' > a \).

**Proof of Claim** \(^1\). Note that a participant and a nonparticipant have the same payoffs from trial outcomes. Let \( T_P(\pi, a) \) denote a nonlitigant’s expected utility from trial. The expected utility for a nonlitigant from participation is:

\[ EU_P(\pi, a) = s^*(x^*(\pi, a)) [b + x^*(\pi, a)V] + [1 - s^*(x^*(\pi, a))] T_P(\pi, a) \]

The expected utility for a nonlitigant from nonparticipation is:

\[ EU_N(\pi, a) = s^*(x^*(\pi, a)) x^*(\pi, a)V + [1 - s^*(x^*(\pi, a))] T_P(\pi, a) \]

If we hold the number of third parties constant, then participants always receive a higher expected utility than nonparticipants; i.e. \( EU_N(\pi, a) < EU_P(\pi, a) \).

**Proof of Lemma** \(^2\). Choose an arbitrary nonlitigant \( i \). Let \( a \in \{0, 1, 2, 3, ..., n - 1\} \) denote the number of third parties besides \( i \). The marginal benefit from joining and increasing the number of third parties is:

\[ \Delta \equiv EU_P(\pi, a + 1) - EU_N(\pi, a) \]

\[ = s^*(x^*(\pi, a + 1))[b + x^*(\pi, a + 1)V] + [1 - s^*(x^*(\pi, a + 1))]T_P(\pi, a + 1) \]

\[ - [s^*(x^*(\pi, a)) x^*(\pi, a)V + [1 - s^*(x^*(\pi, a))] T_P(\pi, a)] \]

\[ = 1 - 2\pi + s^*(x^*(\pi, a + 1))(1 + b + a + k) - s^*(x^*(\pi, a))(a + k) \]

\[ = 1 - 2\pi + \exp \left( -\pi V + 2(a + 1)(1 - \pi) + k \right) \left( 1 + b + a + k \right) \]

\[ - \exp \left( -\pi V + 2a(1 - \pi) + k \right) (a + k) \]

Given the behavior of others, player \( i \) has incentive to participate if and only if \( \Delta(\pi, a, V) \geq 0 \).
Note that function $\hat{\Delta}(\pi, a, V)$ is continuous in $V$ and:

$$\lim_{V \to \infty} \hat{\Delta} = 1 - 2\pi \geq 0 \iff \pi \leq \frac{1}{2}$$

So there exists a value $\hat{V}$ such that $\hat{\Delta}(\pi_L, a, V) > 0$ and $\hat{\Delta}(\pi_H, a, V) < 0$ for all $V \geq \hat{V}$ and for all $a \in \{0, 1, 2, 3, \ldots, n - 1\}$. We restrict attention to such large values of $V$. Note that $\hat{\Delta}(\pi, a, V)$ is continuous in $\pi$ and:

$$\frac{\partial}{\partial \pi} \left[ \lim_{V \to \infty} \hat{\Delta} \right] = -2 < 0$$

So $\hat{\Delta}$ is strictly decreasing in $\pi$ for large values of $V$.

**Proof of Proposition 2.** By Lemma 1, $\hat{\Delta}$ is strictly decreasing in $\pi$ for large values of $V$, and there exists a value $\hat{V}$ such that $\hat{\Delta}(\pi_L, a, V) > 0$ and $\hat{\Delta}(\pi_H, a, V) < 0$ for all $V \geq \hat{V}$ and for all $a \in \{0, 1, 2, 3, \ldots, n - 1\}$. For such large values of $V$, the intermediate value theorem implies that for each $a \in \{0, 1, 2, 3, \ldots, n - 1\}$ there exists a unique point $\tilde{\pi}(a) \in [\pi_L, \pi_H]$ such that $\hat{\Delta}(\tilde{\pi}(a), a, V) = 0$.

Because this point is unique:

$$\Pr(i \text{ joins } | a) = \Pr(\hat{\Delta}(\pi, a, V) \geq 0) = \Pr(\pi \leq \tilde{\pi}(a)) = F(\tilde{\pi}(a))$$

This means that $\Pr(i \text{ joins } | a + 1) < \Pr(i \text{ joins } | a)$ if and only if $\tilde{\pi}(a + 1) < \tilde{\pi}(a)$. Define the following variable:

$$\Psi = \hat{\Delta}(\pi, a) - \hat{\Delta}(\pi, a + 1)
= s^* (x^*(\pi, a + 1)) (2 + b + 2a + 2k) - s^* (x^*(\pi, a))(a + k)
- s^* (x^*(\pi, a + 2))(2 + b + a + k)
= \exp \left( -\frac{\pi V + 2a(1 - \pi) + k}{2k} \right) \left[ 1 - \exp \left( -\frac{1 - \pi}{k} \right) \right]
\times \left[ (2 + b + a + k) \exp \left( -\frac{1 - \pi}{k} \right) - (a + k) \right]$$

So $\Psi > 0$ if and only if:

$$(2 + b + a + k) \exp \left( -\frac{1 - \pi}{k} \right) - (a + k) > 0$$

This always holds for sufficiently large $b$. If $\Psi > 0$ for all $\pi, a$, then:

$$\hat{\Delta}(\tilde{\pi}(a + 1), a + 1) = 0 = \hat{\Delta}(\tilde{\pi}(a), a) > \hat{\Delta}(\tilde{\pi}(a), a + 1)$$

Since $\hat{\Delta}$ is strictly decreasing in $\pi$, it must be true that: $\tilde{\pi}(a + 1) < \tilde{\pi}(a)$. So when $V$ and $b$ are large, the probability that a player $i$ participates is decreasing in the number of other players who participate.  

\[\square\]
References


Figure 1: Structure of the Model

- Accept
  - Early settlement

- Reject
  - Strength of case ($\pi$) chosen
  - Participation decisions result in audience size ($a$)
  - Demand ($x$) chosen

- C wins
  - $\pi$
  - C wins panel ruling

- D wins
  - $1 - \pi$
  - D wins panel ruling
Figure 2: Overcrowding in Third Party Participation

![Graph showing the relationship between Marginal Benefit of Participation, Case Strength, and Number of Other Third Parties. The graph illustrates how the decision to join or not join changes with the number of other third parties and case strength.]

- Marginal Benefit of Participation
- Case Strength
- Number of Other Third Parties

Legend:
- Join
- Don't Join

- a=0
- a=1
- a=2
- a=3
- a=4
Table 1: Model Payoffs

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<thead>
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<th>Early settlement</th>
<th>$C$ wins panel ruling</th>
<th>$D$ wins panel ruling</th>
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<tr>
<td>Complainant</td>
<td>$xV - a$</td>
<td>$V - a - k$</td>
<td>$a - k$</td>
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<td>Defendant</td>
<td>$(1 - x)V + a$</td>
<td>$a - k$</td>
<td>$V - a - k$</td>
</tr>
<tr>
<td>Participant</td>
<td>$b + xV$</td>
<td>$V - a$</td>
<td>$a$</td>
</tr>
<tr>
<td>Nonparticipant</td>
<td>$xV$</td>
<td>$V - a$</td>
<td>$a$</td>
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Table 2: Measuring the Benefit of Third Party Participation on Exports

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient (Std. Err.) (1)</th>
<th>Coefficient (Std. Err.) (2)</th>
<th>Coefficient (Std. Err.) (3)</th>
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</thead>
<tbody>
<tr>
<td>Third Party</td>
<td>0.41** (0.14)</td>
<td>0.32* (0.15)</td>
<td>0.43** (0.15)</td>
</tr>
<tr>
<td>Trade Stake</td>
<td>0.87** (0.02)</td>
<td>0.89** (0.01)</td>
<td>-0.13** (0.02)</td>
</tr>
<tr>
<td>Log Defendant GDP</td>
<td>1.86** (0.29)</td>
<td>1.44** (0.29)</td>
<td>2.01** (0.29)</td>
</tr>
<tr>
<td>Log Complainant GDP</td>
<td>0.03 (0.04)</td>
<td>-0.18 (0.15)</td>
<td></td>
</tr>
<tr>
<td>Panel Ruling</td>
<td>0.03 (0.18)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Third Parties Count</td>
<td></td>
<td>-0.06† (0.03)</td>
<td></td>
</tr>
<tr>
<td>Intercept</td>
<td>-51.81** (8.34)</td>
<td>-40.74** (8.55)</td>
<td>-50.79** (8.80)</td>
</tr>
</tbody>
</table>

N 23847 23646 23646  
R² 0.78 0.76 0.16  
F 1037.36 908.30 18.37  

Significance levels: † : 10% * : 5% ** : 1%

Table 2: Fixed effects on dispute estimation of export levels, with robust standard errors clustered on dispute in column 1. Fixed effects on defendant estimation of export levels, with robust standard errors clustered on dispute in column 2. Fixed effects on dispute estimation of export growth, with robust standard errors clustered on dispute in column 3.
Table 3: Overcrowding Effects In WTO Third Parties: IV Model of Participation

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Coefficient</th>
<th>Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
</tr>
<tr>
<td></td>
<td>(Std. Err.)</td>
<td>(Std. Err.)</td>
<td>(Std. Err.)</td>
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<tr>
<td>Total Number of Third Parties</td>
<td>-0.29**</td>
<td>-0.22**</td>
<td>-0.18*</td>
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<tr>
<td></td>
<td>(0.02)</td>
<td>(0.04)</td>
<td>(0.07)</td>
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<td>Trade Stake</td>
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<td>0.05**</td>
<td>0.05**</td>
</tr>
<tr>
<td></td>
<td>(0.01)</td>
<td>(0.02)</td>
<td>(0.02)</td>
</tr>
<tr>
<td>Change in Exports</td>
<td>-0.05†</td>
<td>-0.08*</td>
<td>-0.03</td>
</tr>
<tr>
<td></td>
<td>(0.03)</td>
<td>(0.04)</td>
<td>(0.04)</td>
</tr>
<tr>
<td>Article XXII</td>
<td>0.28**</td>
<td>0.53**</td>
<td>0.37**</td>
</tr>
<tr>
<td></td>
<td>(0.08)</td>
<td>(0.12)</td>
<td>(0.12)</td>
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<tr>
<td>Retaliatory Capacity</td>
<td></td>
<td>0.11**</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.04)</td>
<td></td>
</tr>
<tr>
<td>Pro-Defendant Third Parties</td>
<td></td>
<td>0.01**</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.00)</td>
<td></td>
</tr>
<tr>
<td>Mixed Third Parties</td>
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<td></td>
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<td>(0.01)</td>
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</tr>
<tr>
<td>Log GDP</td>
<td></td>
<td>0.14*</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.06)</td>
<td></td>
</tr>
<tr>
<td>Log GDP/capita</td>
<td></td>
<td>-0.02</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.04)</td>
<td></td>
</tr>
<tr>
<td>Aid Dependence</td>
<td></td>
<td>-0.05</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.04)</td>
<td></td>
</tr>
<tr>
<td>Intercept</td>
<td>-1.26**</td>
<td>-3.11**</td>
<td>-3.97†</td>
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<tr>
<td></td>
<td>(0.17)</td>
<td>(0.73)</td>
<td>(2.07)</td>
</tr>
<tr>
<td>N</td>
<td>1740</td>
<td>1171</td>
<td>1679</td>
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<tr>
<td>Log-likelihood</td>
<td>-4270.97</td>
<td>-2966.33</td>
<td>-4066.27</td>
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<td>$\chi^2$</td>
<td>262.53</td>
<td>216.22</td>
<td>206.79</td>
</tr>
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</table>

Significance levels: † : 10%  * : 5%  ** : 1%

Table 3: Total Number of Third Parties is instrumented in a first-stage equation, using rest-of-world trade stake as instrument. Robust standard errors in parentheses.