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The World Trade Organization's dispute settlement understanding: Are all (un)equal?

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Abstract

The World Trade Organization (WTO) is one of the most visible and contested institutions within the global economic governance architecture. Both proponents and opponents of trade liberalization regularly voice discontent with the institution's functioning and its effect on the economies of its members. Of particular interest is the WTO Dispute Settlement Understanding (DSU), often described as the organization's flagship body. The WTO DSU helps parties to settle disputes related to the interpretation and enforcement of the provisions drafted and agreed upon over several trade negotiation rounds. This paper presents a game-theoretic approach to analyze whether the WTO DSU ensures equal access and outcomes to all parties who are part of a trade dispute. It particularly addresses the costs of litigation. The paper argues that due to these issues, developing countries will not reap equal benefits from the usage of the WTO DSU as their developed counterparts. Developing countries will, due to a relative higher cost of WTO litigation, be worse off, both as a plaintiff and as a defendant. They will file less complaints and settle for less beneficial outcomes. We also find that bilateral settlement is a very important feature in the WTO DSU.

1. An introduction to the WTO DSU

Over the last decades, international trade has flourished. Nowadays, most goods and services cross several borders from the place of production to the place of final consumption. Due to the increase in international trade, countries felt the need to establish rules on the conduct of international trade transactions. These rules are often stipulated in bilateral or multilateral trade agreements, which codify attempts of countries to mutually restrain the degree of their trade interventions (Staiger, 1994:3). Parties to trade agreements thus trade off national sovereignty for adherence to an international agreement, allowing for mutual beneficial trade liberalization. The World Trade Organization (WTO), the 1994 successor to the General Agreement on Tariffs and Trade (GATT), is currently the main international agreement and organization dealing with international trade. More specifically, the WTO provides countries with a forum for the negotiation of trade liberalizations and trade rules that stipulate the conduct of countries in international trade.

However, under some circumstances individual countries face an incentive to install WTO-inconsistent measures in order to reap terms-of-trade gains, due to domestic pressure for example (Staiger and Tabellini, 1987; Maggi and Rodriguez-Clare, 1998; Beshkar, 2010; Horn, Maggi and Staiger, 2010), or due to disagreement on or uncertainty about the interpretation of the WTO concessions and provisions (Maggi, 1999; Bagwell and Staiger, 2002: 40, 96; Maggi and Staiger, 2011). In order to curb these protectionist reflexes, countries need to be informed about and, if necessary, punished for non-adherence to the WTO agreements (Bagwell and Staiger, 1999; Bown, 2004). This is why a procedure for the interpretation and enforcement of trade agreements has become indispensable or "the backbone of the multilateral trading system".[1]

The WTO Dispute Settlement Understanding (DSU), which was annexed to the WTO agreements, is in this sense the 'crown jewel' of the multilateral trade regime (Esserman and Howse, 2003:131) and "is a central element in providing security and predictability to the multilateral trading system" (WTO DSU, Art. 3.2).[2] One of the most profound changes at the establishment of the WTO was indeed the strengthening and unification of the GATT's dispute settlement procedures.[3] This has given rise to a

[1] Mike Moore, WTO's Unique System of Settling Disputes Nears 200 Cases in 2000, Press Release, 5 June 2000.
[2] The WTO DSU is under review during the Doha Round negotiations, see Bagwell (2008) for an analysis of some proposals.
[3] These changes include: the omission of the unanimity rule for adopting panel reports, the establishment of an Appellate Body, the unification of the dispute settlement, and strict timelines for WTO proceedings compared to the long GATT process.

steep increase in the number of cases compared to the GATT-era.[4] In contrast to most other international organizations that rely on diplomatic means to resolve conflicts, the changes in its dispute settlement procedures have given the WTO 'teeth'. The judgments of the WTO panels are elaborate and legally binding and can even authorize the harmed party to install countervailing measures to compensate for the loss of market access.

The changes in dispute settlement have resulted in a more rule-oriented approach, which presumably reinforced equality among WTO members (Bagwell and Staiger, 2002, 38; Busch and Reinhardt, 2003: 143; Holmes, Rollo and Young, 2003).[5] Conventional wisdom indeed suggests that binding, impartial third-party arbitration rules out power differences between members and hence helps to level the playing field. For instance, even the smallest WTO member can ensure that large economies such as the United States of America (USA) and the European Union (EU) adhere to their trade liberalization concessions. As put by Lacarte-Muró and Gappah (2000: 400): "The [DSU] works to the advantage of all members but it especially gives security to the weaker members who, in the past, often lacked the political or economic clout to enforce their rights and their interests". The question we address is whether the DSU indeed ensures equal opportunities and outcomes for all its members.

This is even more crucial since developing countries are increasingly important players within the international trade regime. For example, in 2013, developing countries accounted for 42% of all trade in goods and 35% of all trade in services (WTO, 2013). When we look at the WTO dispute cases, we can see that developed economies are the main users (about 67% of both plaintiffs and respondents are Organization for Economic Cooperation and Development (OECD) member countries). Taking into account their trade volume, this seems like a reasonable good fit. However, the non-OECD countries also include countries such as Brazil, Russia, India and China. These countries might still be in the list of the lower- or upper-middle-income economies, but they have invested in plenty of resources to use during WTO litigation. These investments mean that they are rather prepared to engage in WTO litigation, and that doing so does not pose a large financial burden any more. Essentially, the vast majority of developing country cases are launched by 5 countries (Brazil, India, Thailand, China, and Argentina). More strikingly, more than 60 developing countries that are members of the WTO have never been

[4] There have been 486 cases from its establishment till December 2014, compared to fewer than 300 cases in the 47-years GATT history.

[5] A rules-based approach make governments agree upon a set of rules or principles. As a result, power asymmetries between countries are expected to play a diminished role. Moreover, the principles of reciprocity and nondiscrimination further lower power asymmetries (Bagwell and Staiger, 2002: 5 and 8).

involved in WTO adjudication.[6] The relative sizes of the trade volume are unsatisfying as an explanation for why the developed economies are more active in WTO litigation. Developing countries are also trading extensively, and can be assumed to face adverse trade policies to the same extent. The volume of their trade might be smaller, but trade is the main pathway to these countries' economic growth and development

The database established by Horn and Mavroidis (2011) allows for a quick overview of the number of complaints filed by developing and developed countries from the establishment of the WTO in 1994 until 2011 (dispute 426). Table 1 shows the number of complaints filed by and against these two types of countries, based on the WTO self-classification.

Table 1: Number of disputes of developed/developing countries as plaintiffs/defendants

Number of disputes	**Developed Defendant**	**Developing Defendant**	**Total**
Developed Plaintiff	138	99	237
Developing Plaintiff	112	62	174
Total	250	161	411

However, since this list includes a number of middle-income countries, Table 2 shows the number of disputes depending on whether the countries are member of either (or both) the Group of 20 (G-20) or the OECD. Both these groups gather powerful economies, and their members are well endowed with resources to support WTO litigation. These economies are not likely to be deterred by litigation costs. The numbers in Table 2 thus give a better idea of the involvement of developing countries in WTO dispute settlement than the ones in Table 1.

Table 2: Number of disputes of OECD/G20 member countries vs non-OECD/G20 member countries.

Number of disputes	**OECD/G20 Defendant**	**Non-OECD/G20 Defendant**	**Total**
OECD/G20 Plaintiff	326	24	350
Non OECD/G20 Plaintiff	46	15	61
Total	372	39	411

These Tables clearly indicate that developed countries file more complaints, and act more often as defendants within the WTO. In particular, very few disputes are initiated or responded to by non-

[6] For an early review, see Abbott (2007).

OECD/G20 countries. As this paper demonstrates, the disparity in the extent to which parties are part of the WTO litigation process can be explained by the cost of WTO litigation. This cost is modelled as the cost of pursuing a single dispute, but might as such be higher when the country involved did not yet build up any experience in dealing with the WTO DSU. Consequently, the cost of litigation comprises both the cost related to preparing a single dispute and the fixed cost of being an active participant in WTO dispute settlement. Developing countries often lack the resources to litigate, which is even higher for them since they lack the experience and the basis of human knowledge to be an active participant.

The Advisory Centre on WTO Law (ACWL) can to a certain extent support developing countries to use the DSU. It provides legal support at discounted rates. However, as shown in Van Kerckhoven (2015), so far, the establishment of the ACWL has not had a significant effect on the actions taken by developing countries within the WTO. There are additional costs to preparing a case that are not alleviated by the ACLW. This paper studies how the cost of litigation, and the differences in the financial resources of the parties involved in a WTO dispute affect the decisions of countries within the WTO.

The focus of this paper is on the different outcomes realized by countries well-endowed with resources in order to prepare a case for WTO litigation (for clarity and simplicity referred to as developed economies) compared with those countries that are rather WTO litigation resource-scare (for clarity and simplicity called developing economies). The paper hence subscribes to the view of the DSU as an enforcement device rather than its role as an informational device.

The paper is structured as follows. The second section provides a literature review. Next, we propose a game-theoretical model of the DSU that studies the actions taken by countries within the DSU. Section four deals more elaborately with the question of inequality within the DSU and provides an interpretation of the findings resulting from the game-theoretical model. We end with a brief conclusion. We show that a relatively high cost of litigation affects the strategies of the parties during WTO litigation. The paper further demonstrates the importance of bilateral settlement, even though this feature is unable to offset the negative effects of litigation for developing countries. These countries might even adapt their policies initially so as to deter any WTO complaints. This stands in striking contrast with the financially well-endowed economies who are able to get away with policies inconsistent with their WTO commitments.

2. Literature Review

Classic economic theory suggests that countries can gain from trade agreements reducing trade barriers.[7] Reciprocity is the key incentive to trade liberalization and is as such also the cornerstone of the WTO regime. However, concluding reciprocal negotiations is greatly obstructed when countries fear that the other party could cheat on the agreement and impose trade restrictions, such as import taxes, limiting the market access for its exporting industries (Bagwell and Staiger, 2002: 6). In a way, this is a classic prisoners' dilemma that obstructs the furthering of international trade and its liberalization. A first way to ease the fear of non-compliance, is to allow parties to self-enforce the agreement. Parties could reply in a reciprocal tit-for-tat manner to the agreement-inconsistent trade policies of their trading partners. However, this requires all members to the trade agreement to have significant market power vis-à-vis the non-complying party and leads to uncertainty and instability.

For that reason, a more extensive structure for the litigation of trade disputes was added to the WTO agreements. WTO litigation can help to solve this dilemma by allowing parties to file a complaint, establish an impartial panel to look into the dispute and if deemed necessary force the violating party to reverse its policy.

The literature on litigation is impressive and giving a complete overview of this literature is not our ambition. An excellent literature review dealing with litigation in general has already been provided by Daughety and Reinganum (2008). For a focus on international trade, see Staiger (1994). However, this strand of literature has not yet extensively looked into international trade litigation and the DSU. The next paragraphs focus on a limited number of specific papers that deserve more attention in the context of this particular paper.[8]

A first attempt to present a game theoretical account of the WTO DSU procedures, was conducted by Büttler and Hausser (2000). They present an interesting but stylized account of the WTO DSU. Their model includes broad forms of 'punishment' such as reputational gains and losses. Similar to other papers, their paper treats the pay-offs as exogenous. Our model adds to this approach by treating the outcomes of the game as endogenous. More specifically, pay-offs in our paper result from distances

[7] For an overview of economic theory and the establishment of the GATT/ WTO, see Bagwell and Staiger, 2002.
[8] Regarding the benefits of having a multilateral dispute settlement body and the WTO DSU in general, a much richer literature is available.

between an actual policy and a country's ideal policy. We further add an analysis of the implementation phase after the panel ruling.

Reinhardt (2001) studies toothless GATT rulings and proposes an asymmetric information model to explain why even the threat of establishing a panel might induce a defendant to partly concede and make concessions even when there does not exist a formal enforcement procedure. He argues that due to uncertainty about the 'type' of the other player (rather than the policy implemented), defendants make greater concessions before rulings than after.

We study a more general model and our focus is on the WTO DSU rather than the GATT. Similar to Büttler and Hauser (2000), the panel's decision is not directly related to the policy set by the defendant. Instead they assign probabilities to the different panel outcomes.[9] Bown (2002) takes a different approach and looks into a country's decision to initiate WTO DSU proceedings, rather than legally adjust their trade policy by using the safeguard provision, allowing for a temporarily protection of a (potentially) harmed industry. He finds that the reforms of the WTO dispute settlement procedures have done little to decrease the likelihood that stronger countries proceed illegally since they have little fear that a smaller country will be able to retaliate strongly. Poletti, De Bièvre, and Chatagnier (2014) described the highly important relationship between trade liberalization negotiations and litigation. They argue that the ability to impose costs on the defendant through the credible threat of litigation opens up the bargaining horizon for trade liberalization.

In the foregoing paragraphs we discussed theoretical papers focusing on the WTO's dispute settlement. The particular ambition of this paper is to add to this research and shed light on how the cost of litigation determines the route a dispute takes. Several papers have described that the rather high cost of WTO litigation could pose a challenge for developing countries in their use of the WTO DSU, both as complainants and as defendants (Davis, 2012, p.8-11; Bown, 2004, 2004b, 2009, p.128; Bown and Hoekman, 2005; Schaffer, 2006; and Iida, 2004). Indeed, preparing a case for WTO litigation is rather costly. Typically, the preparation of a case for WTO litigation requires the involvement of outside experts, such as WTO lawyers and trade economists. These costs need to be taken into account for every single dispute. In addition, there is also a cost that is not specific. To take full advantage of WTO litigation a country needs to invest in in-house specialists that may help industries in bringing potential cases to its attention. Davis and Blodgett Bermeo (2009) empirically show that some countries might

[9] Reinhardt (2001) uses a similar approach but assumes that the defendant has violated the WTO provisions.

lack the ability to enforce their rights in the WTO due to the high fixed costs of becoming an active participant in the WTO DSU. Michalopoulos (2001) adds to this account and finds that in 2000, only 30% of developing WTO members had the necessary staff in Geneva deemed necessary for effective participation in the WTO DSU. Busch, Reinhardt and Schaffer (2009)'s survey further shows that developing countries indeed file fewer complaints. We add to this literature by providing a formal model that shows what role the cost of litigation plays in determining the initiation and outcomes of WTO disputes.

3. The Game-Theoretic model of the DSU

3.1 Actors, Preferences and the Sequences of the game

In this section we study the different steps within the DSU . The game has two players: a plaintiff and a defendant. Both are unitary countries and WTO members. They know the WTO provisions and the trade liberalization concessions to which they agreed. Both countries behave rationally and are risk-neural. Furthermore, we assume there is perfect and complete information.

The issue at hand is a one-shot policy dispute. One of the WTO members has installed a trade policy that impairs the benefits accruing from the WTO agreements to its trading partner. The former becomes the defendant, the latter the plaintiff. This means that the policy implemented is inconsistent with the policy the defendant agreed upon during the WTO negotiation rounds. The latter policy is denoted by p_{wto}. The plaintiff reclaim the harm done by this trade measure to its exporters and economy. It can challenge the policy set by the defendant by filing a WTO complaint.

The policy space is one-dimensional. All variables have a value between [0,1]. In the model outlined below, countries' utility functions are based upon the distance between a country's ideal point and the policies realized at the different outcomes as there are no cash transfers within the WTO. Countries are assumed to have Euclidean preferences, namely they strictly favor a policy closer to their ideal policy. A higher policy, such as an import tax, results in a higher income for the violating country at the expense of the plaintiff. Consequently, the defendant prefers a high policy, while the plaintiff favors the lowest policy possible. We standardize so that the ideal policy of the defendant is equal to 1, while the plaintiff prefers completely free market access to the defendant's market, hence her ideal policy is standardized to 0. The ideal policies also denote the extremes of the policy space.

A WTO dispute typically involves the following steps (WTO DSU Art.3.7) (see figure 1):

1. One party ,the defendant, sets a policy p_d which might be in line with the policy agreed upon during the WTO negotiation rounds, denoted by p_{wto}, but might also deviate from the latter.[10] The plaintiff observes this policy.
2. The plaintiff then has two options. She can file a complaint at the WTO, after which the game continues, or do nothing which gives rise to pay-offs $-(0-p_d)^2$; $-(1-p_d)^2$ for the plaintiff and the defendant respectively.
3. When the plaintiff files a complaint at the WTO, the WTO provisions in first instance call upon the parties to hold consultations and negotiate bilaterally (WTO DSU, Art.4). This negotiation game is similar to the game developed by Bebchuk (1984, 407). In particular, the defendant has the privilege to offer a settlement, a take-it or leave-it policy p_{nn} to the plaintiff.[11] If the plaintiff accepts the offer, no litigation follows, and the final pay-off are $-(0-p_{nn})^2$; $-(1-p_{nn})^2$. Otherwise the game moves on to the fourth step. We assume that pre-litigation negotiations are free or take place at a non-substantial minor cost.
4. If the parties fail to agree on a settlement, WTO panels are initiated (WTO DSU Art 4.7; Art. 6, Art.12). Involving WTO panels comes at a cost, which is typically incurred in order to prepare the case for litigation. More specifically, both parties incur costs, respectively C_p and C_d. We assume that C_p and C_d are positive and limited so that $1-p_{wto}^2 > C_{p,d}$. This ensures that no final policy falls outside the range between the ideal policies of both parties. We further assume that incurring this cost does not change the probability of a ruling in favor of the party incurring the cost. In the model we incorporate every cost related to the filing of a dispute. This includes different legal costs, personnel costs, reputational costs, and even costs related to the negative impact that the filing of a dispute may have on the diplomatic relations with the counterparty. The WTO panels have access to expert knowledge and hence have perfect information on p_d. If the panels rule the policy set by the defendant to be consistent with WTO rules, the game ends and the defendant is allowed to continue setting its policy as he initially did. Otherwise, the panel calls upon the defendant to reverse its policy back to the WTO levels.

[10] Some deviations from the WTO articles are allowed under the safeguard articles GATT Art. XX and Art. XXI. Our approach focuses on policies not allowed under these exception articles. For more on the decision whether to invoke a safeguard article or proceed 'illegally' with the risk of facing a WTO DSU complaint, see Bown (2002).
[11] Appendix 1 describes the results for the alternative scenario in which the plaintiff proposes the settlement.

5. Even after the release of the panel judgment the WTO favors a solution negotiated by the parties to the dispute (WTO DSU Art. 3.7). Consequently, both parties can return to the negotiating table and find a mutually acceptable solution p_n. Again, the defendant formulates a take-it-or-leave-it offer, denoted by p_n.[12] If the plaintiff accepts the offer, the pay-offs are $-(0-p_n)^2 - C_p; -(1-p_n)^2 - C_d$. Otherwise the process moves on to the sixth step.
6. If the negotiations fail to produce a mutually acceptable outcome, the defendant chooses whether to bring its legislation in line with the WTO provisions, or continue to violate the rules. If the defendant complies, pay-offs are $-(0-p_{wto})^2 - C_p; -(1-p_{wto})^2 - C_d$. Otherwise the game moves on to the seventh step.
7. The defendant may fail to reverse his policy to WTO levels. The plaintiff can then request the WTO to allow the installation of Counter-Vailing Measures (WTO DSU Art.22.6).[13] The threat of suspension of concessions is the cornerstone of the WTO, but is also the very last resort (WTO DSU Art. 3.7). These CVMs allow the plaintiff to suspend concessions to the other member equivalent to the level of impairment or nullification of benefits caused by the defendant (WTO DSU Art. 22.4), so that her utility returns to the one achieved at the committed WTO levels.[14] The WTO's dispute settlement consequently ensures that the plaintiff realizes the benefits that accrue from being a WTO member (p_{wto}). If the plaintiff requests CVMs, the following pay-offs are realized: $-(0-p_d)^2 + \left(p_d^2 - p_{wto}^2\right) - C_p;\ -(1-p_d)^2 - \left(p_d^2 - p_{wto}^2\right) - C_d$. If the plaintiff does not request CVMs, pay-offs are $-(0-p_d)^2 - C_p; -(1-p_d)^2 - C_d$.

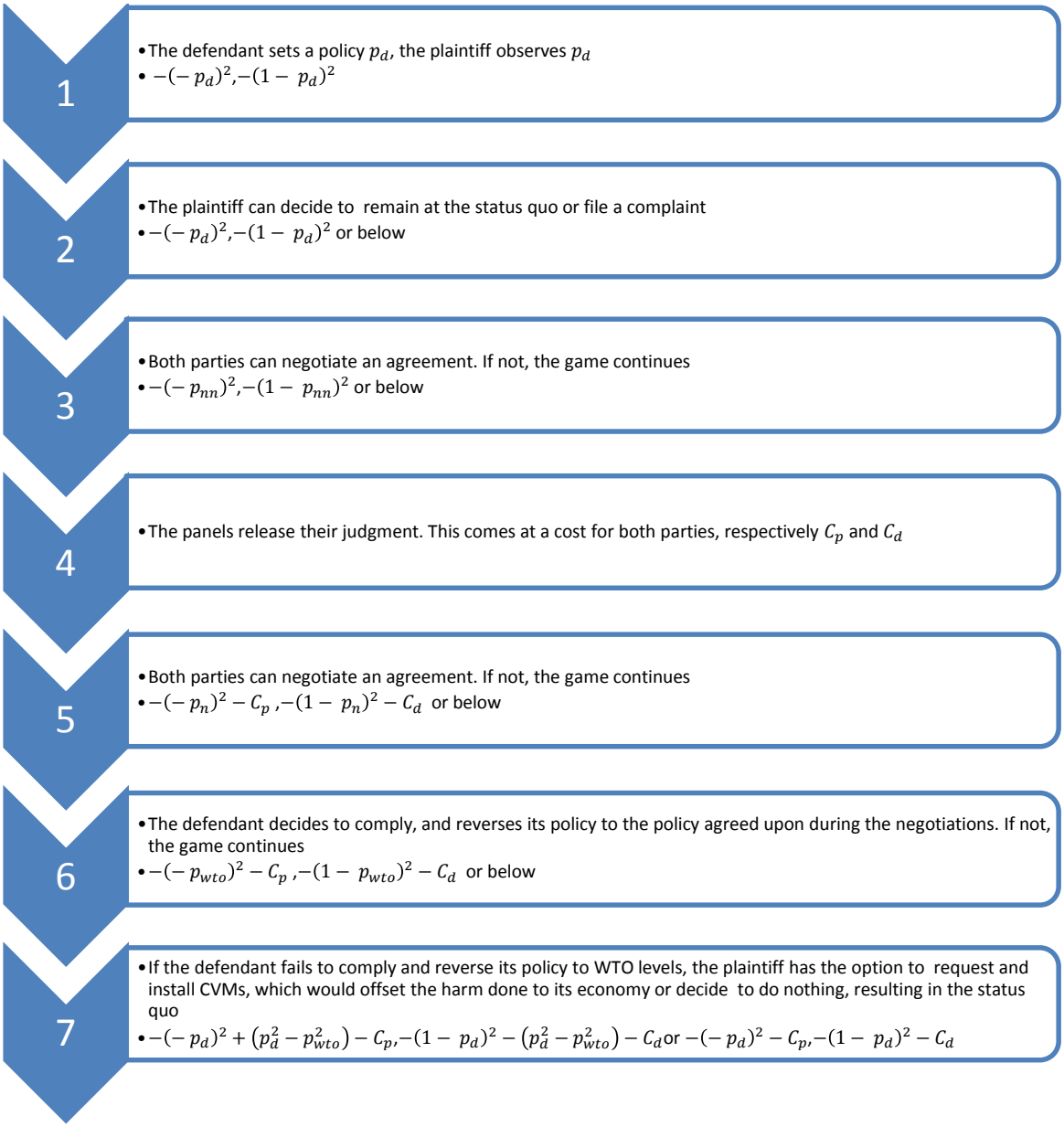
   Both parties can appeal the WTO panel's decision. The Appellate Body then looks into the legal analysis of the panel, but does not to gather additional information. As the panel in this game is able to perfectly disclose the defendant's policy, we do not include the Appellate Body in the model.

Since we assume perfect and complete information, we use backward induction and look for sub-game perfect Nash equilibria. A country's equilibrium strategy then guarantees a higher payoff (π) than any other strategy: $\pi(s_1^*, s_2^*) \geq \pi(s_1, s_2^*)$, with s_1^* the equilibrium strategy and s_1 for every possible strategy

[12] Appendix 1 describes the results when the plaintiff drafts the settlement offer.
[13] Literature often does not focus on this part of the WTO DSU.
[14] The exact amount of CVMs however need to be approved by the DSB. We abstract from that step and assume that the CVMs are such that the negative effect on the plaintiff's economy can be offset. This way, the plaintiff is indifferent between CVMs and adherence, which simplifies the analysis.

for player 1 and $\pi(s_1^*, s_2^*) \geq \pi(s_1^*, s_2)$ with s_2^* the equilibrium strategy and s_2 for every possible strategy for player 2.

Figure 1: The sequence of events



3.2 The equilibrium

In the last step the plaintiff has to choose whether or not to install countervailing measures. The plaintiff's pay-off from requesting CVMs is equal to $-(-p_d)^2 + (p_d^2 - p_{wto}^2) - C_p$, which simplifies to $-p_{wto}^2 - C_p$, while her pay-off from not installing CVMs is $-p_d^2 - C_p$. As a result, requesting and

installing CVMs is the optimal strategy when the policy set by the defendant is higher than the one allowed by the WTO agreements.

Proposition 1: If (1) the panels rules against the defendant, (2) post-panel negotiations fail, and (3) the defendant decides not to adhere to the WTO provisions, then the plaintiff always requests CVMs.

In the sixth step, the defendant has the choice between reversing his policy to the WTO provisions or continuing the game. Continuing the game leads to CVMs. The defendant reverses his policy to the WTO provisions, as long as doing so guarantees a higher utility than incurring CVMs:

$$-(1-p_{wto})^2 > -(1-p_d)^2 - \left(p_d^2 - p_{wto}^2\right)$$

That is, if:

$$p_{wto} - p_{wto}^2 > p_d - p_d^2 \quad (1)$$

When equation (1) does not hold, the defendant prefers to keep his policy as initially set and incur the CVMs.

A reversal to the WTO policy is most likely when $p_{wto} = \frac{1}{2}$. This is the value that maximizes the lefthandside of equation (1). Similarly, countervailing measures are most likely when $p_d = \frac{1}{2}$. When p_{wto} is located closer to $\frac{1}{2}$ than is p_d, the defendant favors to adapt its policy and put it in line with the WTO provisions. When p_d is located closer to $\frac{1}{2}$ than is p_{wto}, by contrast, the defendant prefers CVMs.

As will be shown below, a complaint is only filed when p_d is higher than p_{wto}. So, when p_{wto} is small, that is, there is a lot of trade liberalization, and p_d is closer to $\frac{1}{2}$ than is p_{wto}, the game ends in CVMs. When p_{wto} is equal to or larger than $\frac{1}{2}$, that is, there is a lot of trade liberalization, the game ends with a reversal to the WTO policy. Consequently, a reversal to the WTO policy is more likely in sectors in which there has not been significant trade liberalizations yet. CVMs are more likely in sectors that have already undergone significant trade liberalizations.

Proposition 2: Suppose that (1) the panel rules against the defendant, and (2) post-panel negotiations fail. Then the defendant decides to adhere to the WTO provisions, if and only if p_{wto} is located closer to $\frac{1}{2}$ than is p_d. Otherwise the defendant leaves his policy unaltered and the plaintiff imposes CVMs. Adherence is thus more likely when there is relatively little trade liberalization.

After the panel has released its judgment, the defendant can offer a take-it-or-leave-it proposal (p_n) to the defendant in the fifth step. The plaintiff accepts this offer when it provides her with a higher pay-off than the pay-off realized when continuing the game. This pay-off is the pay-off that corresponds to the WTO policy. The plaintiff thus only accepts a policy that is closer to her than the WTO policy. Similarly, the defendant only offers a p_n that gives him a higher pay-off than the one resulting from a continuation of the game. This pay-off is the pay-off that corresponds to the WTO policy, or, if the continued game ends with CVMs, a policy closer to him. Since the preferences of both parties are located at opposite sides, they prefer moves in a opposite directions. As a result, the post-panel judgment negotiations cannot provide both parties higher utilities than the utilities realized when the game reaches the next step.

Proposition 3: After the panel rules against the defendant bilateral settlement negotiations do not lead to an outcome that is different from the outcome that results when the negotiations fail. Either the defendant adheres to the WTO policy, or the plaintiff imposes CVMs.

The stages we discussed above take place after the WTO's panel has released its judgment on the defendant's policy. Before panels are established, the parties are called upon to engage in consultations and find a mutually agreeable compromise (p_{nn}) in step three. If they manage to reach a settlement, panels are not established and the parties thus do not have to incur the costs related to the establishment of the panels. Once an agreement is reached, the dispute ends and $-(-p_{nn})^2, -(1-p_{nn})^2$ are the utilities realized. The defendant makes the settlement offer. He needs to give the plaintiff at least her expected utility from the continuation of the game.

The plaintiff gets a utility of $-(-p_{wto})^2 - C_p$ when a panel is established. Taking this into account, the defendant maximizes his utility and offers a settlement as close as possible to 1. He hence proposes the plaintiff a policy p_{nn} that makes the plaintiff indifferent between filing a complaint and settling before panels are established. As a result the following must hold:

$$-(-p_{nn})^2 \geq -(-p_{wto})^2 - C_p$$

This negotiated policy thus equals $p_{nn} = \sqrt{p_{wto}^2 + C_p}$

The defendant then has to determine whether this negotiated policy yields a higher utility to him than continuing the game. Suppose first that a continuation of the game ultimately results in CVMs. The defendant then prefers a settlement during consultations rather than a continuation if:

$$-\left(1-\sqrt{p_{wto}^2+C_p}\right)^2 > -(1-p_d)^2-\left(p_d^2-p_{wto}^2\right)-C_d$$

This simplifies to:

$$C_d > 2*p_d-2*p_d^2+2*p_{wto}^2-2*\left(\sqrt{p_{wto}^2+C_p}\right)+C_p \quad (2)$$

This equation demonstrates that pre-panel negotiations can make a difference and lead to a different outcome than CVMs. Settlement is favored when the costs for the defendant and the plaintiff are high. This shows that settlement is more likely for more costly disputes. The cost for the defendant and the plaintiff may depend on the sector or the specific policy measure. Certain policies may be more costly to unveil. Disputes related to certain sectors may be more costly if they require the gathering of very complex scientific evidence, as for example in the hormones disputes.

The derivative of equation two (Eq 2) to the initial policy demonstrates that more settlement takes place when the defendant's initial policy is further away from $\frac{1}{2}$.

$$\frac{\partial Eq\ (2)}{\partial p_d} = 2-4*p_d$$

Taking the derivative for the WTO policy, results in:

$$\frac{\partial Eq\ (2)}{\partial p_{wto}} = 4*p_{wto}-\frac{2*p_{wto}}{\sqrt{p_{wto}^2+C_p}}$$

Less trade liberalization (high p_{wto}) hence results in less settlement, whereas more trade liberalization results in more settlement.

Suppose next that the game eventually ends with a reversal to the WTO policy. A negotiated policy is then agreed upon when:

$$-\left(1-\sqrt{p_{wto}^2+C_p}\right)^2 > -(1-p_{wto})^2-C_d$$

It is obvious that pre-panel negotiations are then always successful (since $\sqrt{p_{wto}^2 + C_p}$ is bigger than p_{wto}).

As mentioned above pre-panel negotiations are more complex in reality. The defendant does not necessarily make the first proposal, and this proposal is usually not take-it-or-leave-it. One can expect that the outcome of successful pre-panel consultations is located between the outcome that results when the defendant proposes the settlement offer, and the outcome when the plaintiff does so. See Appendix 1. The outcome reflects the bargaining powers of the two parties.

Pre-panel negotiations can result in concessions from the defendant, as in Reinhardt (2001) and Busch and Reinhardt (2000). Whereas in their models, which study the GATT, concessions are the result of uncertainty about the 'character' of the other player, in our model they are mainly driven by the litigation costs.

Proposition 4: During pre-panel negotiations the defendant and the plaintiff can often agree to a settlement. This is always the case if the establishment of a panel leads to the WTO policy. If the establishment of a panel leads to CVMs, however, whether a pre-panel settlement is reached depends on the actors' costs, and the locations of the WTO policy and the defendant's original policy. Negotiated outcomes reflect the bargaining powers of the parties.

In step two the plaintiff decides whether to initiate a dispute at the WTO. Filing a complaint at the WTO results in a pay-off of $-(-p_{wto})^2 - C_p$ for the plaintiff, if the defendant drafts the pre-panel settlement offer. As a result, she evaluates the pay-off of initiating a WTO dispute against remaining at the status quo. A complaint is then filed whenever:

$$-(-p_{wto})^2 - C_p > -(-p_d)^2 \quad (3)$$

A higher initial policy increases the likelihood that a complaint is filed. A larger cost of litigation and a larger policy allowed under the WTO decrease the likelihood. Complaints are filed when the cost of litigation is smaller than the difference between p_d^2 and p_{wto}^2 $\left(p_d^2 - p_{wto}^2 > C_p\right)$. Thus, the plaintiff only files a complaint when the defendant's policy is higher than the policy allowed under the WTO provisions. This does not hold though when the plaintiff has the privilege to draft the settlement offer during consultations.

Proposition 5: A lower cost of litigation for the plaintiff, a higher policy set by the defendant and a lower policy allowed under the WTO agreements increase the likelihood that a complaint is filed.

In the first step the defendant chooses what policy to set. He knows that the plaintiff files as soon as equation (3) is satisfied. Keeping this in mind, the defendant sets his policy to give him the maximum utility taking into account the incentives and strategies of the plaintiff. If he wants to deter the plaintiff from filing, his policy can at most be $\sqrt{C_p + p_{wto}^2}$. This gives the defendant a pay-off of:

$$-\left(1 - \sqrt{C_p + p_{wto}^2}\right)^2$$

The defendant has two options.

First, he can set his policy so as to deter a complaint, $p_d = \sqrt{C_p + p_{wto}^2}$. Second, he can set a policy that leads to a complaint. In this case, he puts his policy $p_d > \sqrt{C_p + p_{wto}^2}$. With this policy, the plaintiff files a complaint at the WTO. The complaint results in CVMs when equations 1 and 2 are not satisfied. This happens when $-(1 - p_d)^2 - \left(p_d^2 - p_{wto}^2\right) - C_d > -\left(1 - \sqrt{C_p + p_{wto}^2}\right)^2$. The complaint can also result in settlement, this happens when either equation 1 or equation 2 is satisfied. The defendant choses settlement rather than a deterrence policy when $-(1 - p_{wto})^2 - C_d > -\left(1 - \sqrt{C_p + p_{wto}^2}\right)^2$. In both these cases, the deterrence policy is more likely when the cost for the defendant is higher.

Clearly, the structure of the DSU gives countries the opportunity to deviate from their WTO commitments. This is especially advantageous for the defendant if the plaintiff's costs are high, for example in the case where a weak, developing country is the plaintiff. Moreover, developing countries can be expected to have less bargaining power than their more developed counterparts, whether they are the defendant or plaintiff. When they face a potential complaint from a developed trading partner, they may adopt an even more liberalized trade policy than the one they committed to.

Proposition 6: The defendant will be able to deter a complaint by the plaintiff when he puts its policy at $\sqrt{C_p + p_{wto}^2}$. With the defendant formulating the negotiation offer, the cost of the plaintiff of engaging in WTO litigation results in a higher utility for the defendant than he would get under the

WTO policy. If the defendant sets his policy higher than $\sqrt{C_p + p_{wto}^2}$, the game ends with countervailing measures.

4. Implications for developing countries

As argued above, developing countries face specific problems in dealing with the DSU, both as defendants and as plaintiffs. They are not able to reap similar benefits from trade adjudication as developed countries, which is caused by the cost of WTO litigation. However, our model also allows us to give some more insights in other issues as well, such as the problem of developing countries to install CVMs and the establishment of the ACWL**.**

First, some developing countries face a relatively higher cost of litigation than developed economies and developing countries well-endowed with resources to bring to use in the WTO dispute settlement. Once a developing country decides to involve the WTO panels, it needs to devote resources in order to allow for litigation (Bown and Hoekman, 2005). Developing countries often do not have the same access to qualified and experienced people to work on the dispute. Western countries typically have a large pool of trained and experienced lawyers preparing the case. As demonstrated in our model, the cost of litigation puts a relatively high burden on developing countries, which often lack the deep pockets to thoroughly prepare the dispute. They are hence more likely to settle bilaterally, as Table 3 shows. Only in 8 instances did a non-OECD/G20 defendant not settle during the consultations.

Table 3: Number of empaneled disputes of OECD/G20 member countries vs non-OECD/G20 member countries as defendants.

Number of disputes	**OECD/G20 Defendant**	**Non-OECD/G20 Defendant**	**Total**
Settled	205	31	236
Panel	167	8	175
Total	372	39	411

There is less discrepancy between the likelihood to settle pre-panel for developing and developed countries when we look at the plaintiff's side, as we do in Table 4. This suggests that developing countries make a deliberate choice when they file a complaint, and that they stand ready to involve panels if they decide to file a complaint. Both Tables 3 and 4 also illustrate the low number of disputes in which developing countries take part.

Table 4: Number of empaneled disputes of OECD/G20 member countries vs non-OECD/G20 member countries as plaintiffs.

Number of disputes	**OECD/G20 Defendant**	**Non-OECD/G20 Defendant**	**Total**
Settled	197	39	236
Panel	153	22	175
Total	350	61	411

As shown above (see equation 3), when C_p increases, the plaintiff is less inclined to file a complaint, even in the case when the defendant has significantly deviated from the WTO policy. Moreover, the model also shows that developing countries settle for less beneficial outcomes. Indeed, when C_p gets higher, developing countries get a lower utility out of the consultations as plaintiffs than developed countries would.

This finding is reinforced when the defendant has more negotiating power, in which case the consultations result in a lower utility for the developing country plaintiff. When the developing country defendant is able to make the settlement offer itself, which should be rather rare since the other party in general will has more negotiating power, they might achieve a better pay-off even though their relatively higher cost continues to guarantee a lower pay-off than their developed counterparts would achieve.

Second, another instance where inequality between WTO members might arise is in the use of countervailing measures. When the plaintiff is a developing country, she might incur problems in taking full advantage of the CVM outcome. Installing countervailing measures against a big economy is a very difficult exercise for developing countries. Countervailing measures typically consist of levying a higher import duty on the defendant's imports in the complainant country. For developing countries much in need of the imports from more advanced economies, installing such measures actually has a detrimental effect on their own welfare. Even more importantly, often vivid demand for the developed economy's goods exist, so the countervailing measures will only have little effect on the developed country's economy (Bown and Hoekman, 2005:863; Bown, 2009:134).

The magnitude of the countervailing measures depends on the economic harm of the defendant's policy on the plaintiff. Even if the harm is enormous for a developing economy, the cost of countervailing measures is probably not high enough to provide the incentive to stronger developed economies to

refrain from deviating. Consequently, the fact that countervailing measures are not really a credible threat to the developed economies, developing countries are much more likely to drop a case, even after the panels have found the developed country guilty. This is even more outspoken for certain developing countries that did not have to make trade liberalization concessions when joining the WTO. Although this provides them with much needed policy maneuver room, it makes it impossible for them to threat to withdraw concessions towards other economies. Without the ability to install CVMs, the result after the ruling by the WTO panel boils down to either reversal to the WTO policy, or the status quo policy.

Table 5: Number of disputes ending with CVMs of OECD/G20 member countries vs. non-OECD/G20 countries members as defendants.

Disputes	**OECD/G20 Defendant**	**Non-OECD/G20 Defendant**	**Total**
Ending with settlement	122	8	130
Ending with CVMs	45	0	45
Total	167	8	175

Table 5 demonstrates that developing country defendants never choose the CVM option, and always settle a dispute after panels are established when they act as the defendant in the dispute.

Table 6: Number of disputes ending with CVMs of OECD/G20 member countries vs. non-OECD/G20 countries members as plaintiffs.

Disputes	**OECD/G20 Plaintiffs**	**Non-OECD/G20 Plaintiffs**	**Total**
Ending with settlement	110	20	130
Ending with CVMs	43	2	45
Total	153	22	175

The same holds true for when the developing countries acts as the plaintiff (Table 6). The likelihood of ending the dispute with CVMs is again much lower for developing countries than for their developed counterparts.

Taking into account their inability to install CVMs, the developing plaintiff might then prefer the status quo policy.[15] Hence, the model shows that without the credible threat of facing retaliation through

[15] For example, in the EC-Bananas case, Ecuador decided not to install CVMs on the EC, although they were formally allowed to do so

CVMs, there is little incentive for developed countries to put their policies in line with the WTO concessions when they are dealing with developing countries.

Developing countries can also engage as defendants in WTO disputes. This is however less common as developing countries, especially the least developed among them, are not always obliged to make concessions and hence their policies often do not stand the scrutiny of WTO panels (their policy overhang makes them less likely to have to defend against a challenge). When a case against a developing economy is initiated, the latter once more faces certain issues. In particular, developing countries are more likely, once they violated the WTO provisions, to face WTO dispute settlement when facing a developed economy for which the initiation of such a case is not so expensive. Moreover, as C_d is relatively high for developing countries, they are much more likely to settle before panel ruling. Table 3 clearly demonstrates this finding, as it shows that only eight non OECD/G20 defendants have awaited a panel ruling.

This is even more so as the threat of CVMs installed by the developed economy is enormous for most developing countries. Due to their less diversified exports and the fierce competition of other developing countries in their export sectors, a higher tariff installed on their exports by a major, developed trading partner has a detrimental effect on the developing country's economy. In that case, developing economies are more likely to settle bilaterally or adhere to WTO rulings rather than setting their ideal policy and incurring countervailing measures.

Table 5 indeed clearly indicates that developing country defendants shine away from CVMs. In not a single instance did a developing country defendant opt for CVMs rather than settlement.

Proposition 7: As a plaintiff, developing countries are less likely to file a complaint at the WTO. This is due to their relatively higher cost of litigation. Moreover, developing countries can have difficulties in credibly threatening a developed country with CVMs, which results in fewer complaints as well. When establishing panels is more costly for the developing country than the developed country, settlement in the consultation phase is more likely for developing countries. This however provides them with a relatively low utility. As a defendant, the significant threat of CVMs induces developing countries to set their initial policies so as not to face the risk of being filed against. They are also more likely to settle during the consultations phase, only realizing a relatively lower utility (relative to developed economies).

In both the case of a developing country as defendant and the case of a developing country as plaintiff, there is one more instance where power relations can play a role. In our model we gave the defendant the possibility to offer a policy to the plaintiff in the consultations phase (the opposite case is described in appendix 1). In reality, it will be the party with the most negotiating power that ultimately benefits most during the settlement phases. Developing countries generally have a weaker bargaining position, which results in a lower pay-off from pre-panel bargaining. This is even more because the party's costs are included in the outcomes of the consultations. Given that the costs for developing countries can be high, this results in a less beneficial consultations outcome. For more equal parties, the outcome of the consultations will lie somewhere in between these two extremes.

The establishment of the Advisory Centre on WTO Law (ACWL) can support developing countries in addressing these issues. The ACWL can support developing countries during the WTO dispute settlement proceedings at a discounted rate. Involving the ACWL can help developing countries to overcome the cost of preparation of a dispute case. In such instance, the developing country benefits from a lower cost, and the game's results will more closely reflect the results for a developed economy. However, the ACWL will not be able to help countries to overcome the problems in installing CVMs. Hence, for a developing country plaintiff, the ACWL might be less interesting.

5. Conclusions

This paper presents a spatial model that sets light on the conditions of settlement under the DSU. In doing so, it contributes to the academic literature by demonstrating how the cost of litigation alters the decisions of financially less-endowed countries in comparison to countries with more resources. Moreover, this papershows that policies can be inconsistent with the WTO agreements without ever being subject to litigation.

The DSU is a unique dispute settlement mechanism in international relations. It allows every WTO member to file a complaint against any other WTO member, which will, when found guilty, have to reverse its policy to the one agreed upon during the WTO negotiation rounds. As such, it allows even the smallest WTO member to challenge a policy set by the larger WTO members, which would render all WTO members relatively equal in dispute settlement and rule out their power asymmetries. However, the model presented casts a different view. In particular, we find that the structure of the WTO dispute settlement results in a more subtle unequal treatment. Developing countries, less endowed with

financial resources, file fewer complaints than more developed WTO countries as they face a relatively higher litigation cost. Developing countries further have less negotiation power, and lack the ability to threaten a developed country with CVMs, all of which leads to a lower utility compared to developed countries, who have deeper pockets. Hence, the cost of litigation drives down the utility for a developing country both as a plaintiff and as a defendant. The problems faced by developing countries also alter their decisions at the different steps of WTO litigation. They are more likely to put their policies in line with their WTO commitments in order to deter complaints from being filed against them, and they are more likely to shy away from CVMs, favoring bilateral settlement instead. Developed countries, when trading with developing countries, can put their policies rather high before being subject to litigation.

We further find that bilateral settlements are very common, and that CVMs are mainly favored when there has been extensive trade liberalization in the sector to which the dispute relates. Consequently, we argue that not every WTO member is equal within the WTO DSU. The ACLW can help, as it allows developing countries to seek legal support at a discounted rate. This might help to offset the negative effects of their relatively higher litigation cost, and could ensure that developing countries realize similar outcomes as their more developed counterparts in WTO disputes.

6. References

Abbott, R. (2007). Are Developing Countries Deterred from Using the WTO Dispute Settlement System? Participation of Developing Countries in the DSM in the years 1995-2005. *ECIPE Working Paper,* 01/2007.

Bagwell, K. (2008). Remedies in the World Trade Organization: An Economic Perspective, in Janow, M.E.; Donaldson, V. and Yanovich, A. (eds.) *WTO: Governance, Dispute Settlement & Developing Countries.* Juris Publishing, Inc.

Bagwell, K. and Staiger, R.W. (2002b). *The Economics of the World Trading System.* MIT Press.

Bebchuk, L.A.. (1984). Litigation and settlement under imperfect information, *the RAND Journal of Economics,* 15(3), 404-415.

Beshkar, M. (2010). Optimal Remedies in International Trade Agreements, *European Economic Review,* 54, pp. 455-466.

Bown, C.P. (2002). The Economics of Trade Disputes, the Gatt's Article XXIII, and the WTO's Dispute Settlement Understanding, *Economics and Politics,* 14(3), pp. 283-323.

Bown, C.P. (2004). On the economic success of GATT/WTO Dispute Settlement, *The Review of Economics and Statistics,* 86(3), pp. 811-823.

Bown, C.P. (2004b). Developing Countries as Plaintiffs and Defendants in GATT/WTO Trade Disputes, *The World Economy*, 27(1), 59-80.

Bown, C.P. and Hoekman, B.M. (2005). WTO Dispute settlement and the missing developing country cases: engaging the private sector, *Journal of International Economic Law,* 8(4), pp. 861-890.

Bown, C.P. (2009). *Self-Enforcing Trade: Developing countries and WTO Dispute Settlement.* Brookings Institution Press.

Busch, M.L. and Reinhardt, E. (2000). Bargaining in the Shadow of the Law: Early Settlement in GATT/WTO Disputes, *Fordham International Law Journal,* 24, 158-172

Busch, M.L. and Reinhardt, E. (2003). Developing countries and the General Agreement on Tariffs and Trade/ World Trade Organization Dispute Settlement, *Journal of World Trade,* 37(4), 719-735

Bush, M.; Reinhardt, E. and Schaffer, G. (2009). Does legal capacity matter? A survey of WTO members, *World Trade Review,* 8(4), pp. 559-577.

Butler, M. and Hauser, H. (2000). The WTO Dispute Settlement System: First Assessment from an Economic Perspective, *Journal of Law, Economics and Organization*, , vol. 16(2), p. 503-533.

Daughety, A.F. and Reinganum, J.F. (2008). Settlement, Working Papers 0808, Department of Economics, Vanderbilt University.

Davis, C.L. and Blodgett Bermeo, S. (2009). Who Files? Developing Country Participation in GATT/ WTO Adjudication, *The Journal of Politics,* 71(3), 1033-1049.

Davis, C.L. (2012). *Why Adjudicate? Enforcing Trade Rules in the WTO*. Princeton University Press

Esserman S. and Howse, R. (2003). The WTO on Trial, *Foreign Affairs,* 82, 130-140.

Holmes, P.; Rollo, J. and Young, A.R. (2003). Emerging Trends in WTO Dispute Settlement, *World Bank Policy Research Working Paper,* 3133.

Horn, H., Maggi, G. and Staiger, R.W. (2010). Trade Agreements as Endogenously Incomplete Contracts, *American Economic Review*, 100(1), pp. 394-419.

Horn, H. and Mavroidis, P.C. (2011). *WTO Dispute Settlement Database,* available at: http://econ.worldbank.org/WBSITE/EXTERNAL/EXTDEC/EXTRESEARCH/0,,contentMDK:20804376~pagePK:64214825~piPK:64214943~theSitePK:469382,00.html

Iida, K. (2004). Is WTO Dispute Settlement Effective?; *Global Governance,* 10(2), pp. 207-225.

Lacarte-Muró, J. and Gappah, P. (2000). Developing Countries and the WTO Legal and Dispute Settlement System: A View from the Bench, *Journal of International Economic Law,* 3(3), pp. pp. 395-401.

Maggi, G. (1999). The role of multilateral institutions in international trade cooperation, *The American Economic Review,* 89(1), 190-214.

Maggi, G. and Rodriguez-Clare, A. (1998). The value of trade agreements in the presence of political pressures, *Journal of Political Economy*, 106, pp. 574-601.

Maggi, G. and Staiger, R.W. (2011). The Role of Dispute Settlement Procedures in International Trade Agreements, *The Quarterly Journal of Economics,* 126, 475-515.

Michalopoulos, C. (2001). *Developing Countries in the WTO*. New York: Palgrave.

Poletti, A., De Bièvre, D., and Chatagnier, J.T. (2014). Cooperation in the shadow of WTO law: why litigate when you can negotiate. *LUISS Academy Working Paper* (3/2014).

Reinhardt (2001). Adjudication without enforcement in GATT disputes, *Journal of Conflict Resolution,* 45(2), pp. 174-195.

Rodrik, D. (2005). *One Economics, Many Recipes*. Princeton University Press

Staiger, R.W. (1994). International Rules and Institutions for Trade Policy, *NBER Working paper,* 4962.

Staiger, R.W. and Tabellini, G. (1987). Discretionary Trade Policy and Excessive Protection, *American Economic Review,* 77(5), pp. 823-837.

Van Kerckhoven, S. (2015). A Strategic Statistical Model of the Escalation of Trade Disputes. *MSI Research Report*

WTO (2013). International Trade Statistics 2013 Report, accessible at: http://www.wto.org/english/res_e/statis_e/its2013_e/its13_toc_e.htm

7. Appendix

Instead of the defendant, the plaintiff can be given the privilege to draft and offer the settlement policies to the defendant.

Post-panel judgment phase

Let us first study the post-panel settlement offer. When the plaintiff has the privilege to draft the settlement offer, she will, just as when the defendant proposes the settlement policy, be unable to forge a settlement offer that would leave either party better off. Bilateral settlement consequently does not result in a higher utility for either party, but remains an alternative for both outcomes.

Consultations phase

During the consultations phase, the plaintiff can once more get the privilege to draft the settlement offer. Now, the settlement offer depends on the later steps in the game. When the game would ultimately have ended with a reversal to the WTO policy, the offer of the plaintiff to the defendant depends on the cost of litigation for the defendant. The striking result is that the plaintiff can even achieve a better outcome than the WTO policy. More specifically, she is be able to offer a p_{nn} lower than p_{wto}, to the extent that C_d is larger than $-2 * p_{nn} + 2 * p_{wto} + p_{nn}^2 - p_{wto}^2$. So the settlement policy can be up to:

$$C_d - 2 * p_{wto} + p_{wto}^2 = -2 * p_{nn} + p_{nn}^2$$

This equation shows us that the plaintiff is even able to offer the defendant a policy lower than p_{wto}. Moreover, it is easy to see that the plaintiff's ability to extract additional benefits from the defendant depends on the cost for the defendant. The policy allowed by the WTO provisions also plays a role. The looser the commitments (hence higher allowed policies), the higher the settlement policy needs to be, which results in a lower utility for the plaintiff.

Since this allows the plaintiff to reap some additional benefits (a lower policy than the WTO policy implemented) compared to the case whereby WTO litigation results in a reversal to the WTO policy, the plaintiff always prefers to settle bilaterally, and is always able to draft a proposal that would be accepted by the defendant while giving herself a higher utility than continuing the game.

When the defendant prefers to end the game with CVMs, and the plaintiff is given the opportunity to draft the take it or leave it offer, she can again benefit at the expense of the defendant. In this case, the defendant needs to be offered a p_{nn} such that $-(1 - p_d)^2 - \left(p_d^2 - p_{wto}^2\right) - C_d \leq -(1 - p_{nn})^2$.

This solves to: $-C_d + 2 * p_d - 2 * p_d^2 + p_{wto}^2 \leq 2 * p_{nn} - p_{nn}^2$

The defendant in this case can sometimes agree to a policy lower than the one committed to during the trade rounds at the WTO (depending on the values of p_d, p_{wto} and C_d). More specific, a higher litigation cost for the defendant makes a lower settlement offer possible, whereas a higher p_{wto} and p_d drives up the settlement policy, to the detriment of the plaintiff who prefers a lower settlement policy. However, the plaintiff only offers a settlement policy when this leaves herself better off than continuing the game. The utility realized when the game ends in CVMs is $-p_{wto}^2 - C_p$. Hence, settlement is preferred over CVMs when:

$$-p_{wto}^2 - C_p < -p_{nn}^2$$

$$-p_{wto}^2 - C_p + 2 * p_{nn} < 2 * p_{nn} - p_{nn}^2$$

We can solve this now keeping in mind the resulting settlement offer.

$$-p_{wto}^2 - C_p + 2 * p_{nn} < -C_d + 2 * p_d - 2 * p_d^2 + p_{wto}^2$$

$$p_{nn} < -\frac{C_d}{2} + p_d - p_d^2 + p_{wto}^2 + \frac{C_p}{2}$$

Consequently, when the settlement offer gets too high, the plaintiff might prefer neglecting the consultations, and install CVMs in the end. Less settlement can be found when the cost for the defendant is lower. More settlement is possible when the cost for the plaintiff is higher, when the WTO policy is high, and to a lesser extent when the defendant's initial policy is higher. Consequently, no settlement is found during consultations when the settlement policy is too high to offset the costs and benefits associated with CVMs.

We can now study whether there are differences in the action probabilities depending on the actor making the settlement offer.

When the plaintiff offers the consultations phase settlement policy, the resulting policy is lower than the one that would have been offered in the case where the defendant offers such policy, both in the case of a reversal to the WTO policy, as in the case of CVMs.

When the game would have ended with CVMs, there might be a difference in the likelihood of finding a settlement during the consultations phase depending on the party drafting the settlement offer. When the defendant offers the settlement offer, settlement is favored over CVMs when:

$$C_d > 2 * p_d - 2 * p_d^2 + 2 * p_{wto}^2 - 2 * \left(\sqrt{p_{wto}^2 + C_p}\right) + C_p$$

Which can be rewritten as:

$$C_d - C_p > 2 * p_d - 2 * p_d^2 + 2 * p_{wto}^2 - 2 * \left(\sqrt{p_{wto}^2 + C_p}\right)$$

With the settlement privilege extended to the plaintiff, settlement is favored over CVMs when:

$$-p_{wto}^2 - C_p + 2 * p_{nn} < -C_d + 2 * p_d - 2 * p_d^2 + p_{wto}^2$$

Which can be rewritten as:

$$C_p - C_d > -p_{wto}^2 + 2 * p_{nn} - 2 * p_d + 2 * p_d^2 - p_{wto}^2$$

Let us now define $C_d - C_p$ as the litigation cost advantage of the defendant over the plaintiff, which can be denoted by ΔC.

Consequently, with the settlement offer drafted by the defendant:

$$\Delta C > 2 * p_d - 2 * p_d^2 + 2 * p_{wto}^2 - 2 * \left(\sqrt{p_{wto}^2 + C_p}\right)$$

Whereas with the settlement offer drafted by the plaintiff:

$$\Delta C < 2 * p_{wto}^2 - 2 * p_{nn} + 2 * p_d - 2 * p_d^2$$

These two equations show that the difference between the likelihood of settlement dependent on the party having the power to draft the settlement offer boils down to the settlement offers offered in both instances. It further depends on the realizations of the variables common to both equations (p_d, p_{wto}). Structurally, there is no difference between the likelihood of settling in both instances.

Filing decision phase

When the plaintiff drafts the take-it-or-leave it offer, the plaintiff files more easily since the policy outcome will be more beneficial for him. It is however not possible to fully work out this equation. However, the above equations shows us that if the plaintiff drafts the settlement offer, she might get a very low policy in place (even lower than p_{wto} in certain circumstances). Hence, more disputes are launched.

Initial policy

Due to the higher likelihood of the initiation of a dispute when the plaintiff gets to offer the settlement policies, the defendant has to put its policy lower. In certain cases, he might even be willing to put its policy lower than the one committed to over the trade liberalization round so as to be certain that complaints are deterred.

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