

The Evolution and Utilization of the GATT/WTO Dispute Settlement Mechanism

Pao-li Chang

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Pao-Li Chang*

School of Economics

Singapore Management University

Singapore 178903

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Abstract

This paper provides a theoretical framework of dispute settlement to explain the surge in blocking incidence of GATT panel reports during the 1980s and the variations in withdrawn incidence versus total disputes across different decades of the GATT regime. The study first suggests the role of the degree of legal controversy over a panel ruling in determining countries' incentives to block (appeal) a panel report under the GATT (WTO) regime. The study then analyzes the effects of political power on countries' incentives to use, and their interactions in using, the dispute settlement mechanism, when two-sided asymmetric information exists regarding panel judgement.

Keywords: dispute settlement; legal controversy; block; appeal; two-sided asymmetric information; political cost

JEL classification: F02; F13; K33; K41; K42

*Tel: +65-6828-0830; fax: +65-6828-0833. *E-mail address:* plchang@smu.edu.sg (P.-L. Chang).

1 Introduction

Since its inception in 1947, the GATT has evolved into a comprehensive framework of international trade laws as it exists today under the WTO. The operation of the GATT/WTO system has, to a large extent, hinged on the effectiveness of its dispute settlement mechanism. This procedure allows member countries to challenge other member countries' questionable trade measures with reference to the GATT/WTO agreements, and hence serves as a mutual surveillance and enforcement mechanism. Beginning with meager treaty clauses, the dispute procedure was elaborated increasingly during the GATT years, but it was the adoption of the WTO dispute procedure in 1995 that fundamentally changed the nature of dispute settlement.

The customary practice under the GATT of requiring all decisions to be made by consensus posed a structural problem for the GATT dispute procedure. The defending party, by raising objection to consensus, could delay or block the procedure from moving forward, the most serious problem being the potential of the defending country to block an adverse ruling. The WTO dispute procedure established in 1995 altered several aspects of the GATT mechanism. The most significant was the removal of the consensus rule for adoption of rulings and hence the elimination of the blocking problem. A ruling made by a panel of experts will be deemed automatically adopted. To guard against possible legal errors made by the panel, an appellate procedure was added. A panel ruling can be appealed by either one of the disputing parties. If appealed, the dispute will proceed to an appellate panel, whose judgment will be final and likewise adopted automatically unless there is a consensus against adoption.

Power politics, inherent in international relations, poses another threat to the efficient use of the GATT dispute settlement mechanism. Considerations of potential diplomatic cost (be it political, economic, or military) influence countries' decisions of whether to initiate the formal procedure for resolving trade disputes. During the dispute settlement process, power politics might also affect countries' ability to extract bilateral settlements and to carry on the litigation. To what extent power politics have intervened in the GATT legal system depends on the international support for using the dispute procedure to resolve trade conflicts. The data on dispute cases under the GATT regime during the 1950s–1980s showed a varied pattern in the number of filed complaints and their procedural outcomes across different decades. The pattern in the data corresponds to

some interesting evolutions and movements in these decades, as to be documented later, which conceivably have affected countries' political considerations of using the GATT dispute procedure. Although not immune from the influence of power politics, the WTO procedure, given its more automatic and rule-based structure, leaves less room for power play. The procedure has since established itself as the norm for resolving trade conflicts in the international community. This is reflected in the dramatic increase of filed complaints under the WTO procedure.

Most studies on the GATT/WTO dispute settlement mechanism have been conducted by scholars of law and political science.¹ Bütler and Hauser (2000) was the first theoretical paper that systematically investigated this mechanism from an economic perspective.² They, however, focused on the WTO dispute procedure; the incentives and interactions of countries in using the GATT dispute procedure were left largely unaccounted for. Furthermore, their theoretical model maintained a complete information framework and thus excluded the possibility of “withdrawn or abandoned” cases. We observe, however, non-negligible amounts of such cases during both the GATT and WTO eras.

In a related literature on civil litigation, P'ng (1983), Nalebuff (1987), and Bebchuk (1988) present some potential frameworks toward understanding withdrawn civil disputes. In these papers, negative-expected-value suits can be filed with the presence of one-sided asymmetric information, and as a result, these suits are withdrawn or dropped if a settlement fails. Upon closer inspection, however, these papers are not so satisfactory in explaining withdrawn suits, because the withdrawal outcome in these papers either does not arise in the equilibrium or arise in the equilibrium only if it is costless for the plaintiff to file and then to withdraw a suit. In practice, countries typically have to incur (pecuniary or nonpecuniary) costs by bringing a dispute under the GATT/WTO procedure. Thus, the one-sided asymmetric information models discussed above can not predict withdrawn cases and fully account for the interactions of disputing parties in international litigations.

In this paper, I propose a theoretical framework of dispute settlement to explain the incidence of complaints filed and their disposition (withdrawn, settled, ruled – blocked or appealed) under the GATT/WTO procedures. I adopt a two-sided asymmetric information framework which allows

¹See, for example, Hudec (1993, 1999) and Jackson (1997, 2000) for analysis from the legal perspective, and Busch (2000) for investigations from the political-science perspective.

²See Horn et al. (1999) for an empirical study of the WTO dispute settlement system. See also Bown (2002a,b) for studies of the GATT/WTO dispute mechanism versus the safeguards provisions.

for potential litigation (political) cost, and explore the effects of political power on countries' incentives to use, and their interactions in using, the dispute settlement mechanism. The model's results indicate that as the political cost (relative to potential benefit) of using this mechanism to resolve trade conflicts increases for the complaining country, the dispute procedure is initiated less frequently, whereas the incidence of cases withdrawn or abandoned increases at first before decreases toward zero.

This paper then investigates the role of the degree of legal controversy over a panel ruling in determining countries' incentives to block or appeal a panel report. It is shown that under both the GATT and WTO procedures, there exists asymmetric disadvantage against the complainant. The potential benefit for the complainant to block or appeal an adverse panel ruling is uniformly less than the defendant, while the potential cost for both to do so is the same. This disadvantage to the complainant is diminished under the WTO procedure compared to the GATT, but is not totally eliminated. It is also shown that as the level of legal controversy over panel rulings increases overall, GATT panel reports are blocked at a higher frequency. The propensity to block a panel report under the GATT, however, is generally lower than to appeal a panel report under the WTO.

The rest of the paper is organized as follows. Section 2 gives a more detailed account of the evolution of the GATT/WTO dispute settlement mechanism. Section 3 sets up the theoretical structure of the dispute mechanism, including the payoff and uncertainty structure. In Section 4, the theoretical model is developed and applied to explain the stylized facts that we observe in the data. Concluding remarks are collected in Section 5.

2 Evolution of the GATT/WTO Dispute Settlement Mechanism

When the attempt to create an international trade organization in the late 1940s failed, the successfully negotiated trade agreement, the GATT, was left without a well-defined institutional structure.³ Only a few clauses with regard to dispute settlement were contained in the original GATT, most of which centered around Article XXIII. The article states that a member country may request consultation with another member country, should it consider that its benefit expected under the GATT is being nullified or impaired by the other member country's trade measure. If no settlement

³For more details, see Jackson (2000, p. 119).

is reached between the parties, the matter may be referred to the “Contracting Parties” (the member countries), which shall investigate and recommend action or give a ruling on the matter. In appropriately serious cases, the Contracting Parties may also authorize retaliatory actions. Despite the skeletal framework of Article XXIII, the dispute settlement in the early years of GATT worked rather smoothly, thanks to its small and homogeneous membership. Disputes were resolved in plenary meetings by rulings from the chair or consensus votes of member countries. As the procedure evolved, it began to delegate members’ complaints to “working parties,” formed by interested governments. One remarkable development occurred in 1952 when the GATT started using “the panel on complaints.”⁴ A panel composed of neutral government delegates would be established to hear and rule on a dispute. They would act in their own capacities and independently of any government interests. This development marked the beginning of third-party adjudication of legal claims brought under the GATT.

Because only the Contracting Parties had the power to decide on a matter, a panel report had to be adopted or approved by the Contracting Parties before its rulings became binding. Because it was a customary practice of GATT to require all decisions to be made by consensus, the procedure was inherently subject to delaying or blocking by the defending party, which by raising objection to consensus could keep the panel procedure from moving forward: the creation of the panel, the selection of the panelists, the adoption of the panel report, the authorization of retaliation. However, this delaying or blocking problem did not begin to surface until in the 1970s, the notorious example being the DISC case brought by the EC against the US, and three US counter-claims.⁵

During the Tokyo Round negotiations conducted in 1973–1979, the GATT dispute settlement mechanism developed on dual tracks. On one hand, the negotiating efforts to strengthen the general dispute procedure of Article XXIII did not go very far. The resulting document “Understanding”⁶ codified the established practices in implementing the procedure, but it was still ambiguous about whether the complainant had an absolute right to a panel process, and it did not take away the veto power of disputing parties in panel adoption. On the other hand, many of the new “MTN Codes,” resulting from negotiation efforts to restrain nontariff trade measures, also created their own dispute procedures. They varied in the degree of rigor and automaticity, but generally appeared to grant the

⁴Hudec (1993), p. 30.

⁵See Hudec (1993), Complaint 69, 70, 71, 72.

⁶“Understanding Regarding Notification, Consultation, Dispute Settlement and Surveillance.”

complainant an automatic right to panel procedures. In this respect, the dispute procedures under these Codes were stronger than the GATT general procedure. The consensus rule, nevertheless, was still upheld for panel adoption in these various Code procedures.⁷

In 1995, the WTO was established following the completion of the Uruguay Round negotiations. The new Dispute Settlement Understanding (DSU) procedure under the WTO significantly renovated several aspects of the GATT mechanism. No longer are the separate procedures under the Tokyo Round Codes valid. The DSU governs all parts of the GATT/WTO system and serves as the single, unified mechanism for dispute settlement. Furthermore, the blocking problem that had plagued the GATT procedure is completely eliminated. A complaining country is granted an automatic right to have a panel created. Thus blocking is prevented at this early stage. Most importantly, a panel report is deemed automatically adopted by the new Dispute Settlement Body (DSB). Nevertheless, an appellate procedure is added as a safeguard against possible legal errors made by the panel. Either one of the disputing parties may consider appealing against the panel report to the Appellate Body (AB), whose judgment will be final and likewise adopted automatically unless there is a consensus against adoption. Thus, blocking a panel report has become virtually impossible under the WTO procedure.⁸

3 Theoretical Setup

The GATT and WTO dispute settlement procedures can be represented by the game trees in Figure 1. Suppose a trade dispute arises. The complaining country (C) detects that a trade-related practice implemented by the defending country (D) might be in violation of the GATT/WTO agreement or constitute “nullification or impairment” of benefits C expected under the agreement. C can consider whether or not to invoke the GATT/WTO dispute settlement procedure. If C decides not to file the case (nf), nothing happens and the status quo welfare remains, which is normalized to be zeros.

If C decides to file the case (f), it incurs (pecuniary or nonpecuniary) cost and benefit. The potential costs of bringing a complaint under the GATT/WTO include international political costs that result from an aggravated international relationship with the defending country. For example,

⁷Hudec (1993), pp. 53–57.

⁸Jackson (2000), pp. 177–178.

the cost can be a loss of existing financial aid or preferential treatment provided by the defending country, or damage to the prospect of mutual cooperation between the countries in commerce or in politics. On the other hand, a government usually brings a case under the GATT/WTO in response to a demand from a domestic industry or lobby group. By complying with their requests, the government earns political support from these industries or lobbies, which can mean more political contributions or more electorate votes in the future. These potential international political costs and domestic political benefits vary with country pairs, industries involved, and international support for the GATT/WTO dispute settlement procedure. Let K^f represent the political cost incurred by C in every period, net of domestic political benefit, by filing a complaint against D under the GATT/WTO. It is assumed that C incurs K^f in every period once it files the dispute, unless the dispute is settled or withdrawn, in which case K^f is incurred only for the period in which the dispute is present under the procedure.⁹

In practice, C invokes the GATT/WTO dispute procedure by requesting consultation with the defending country D. This is indicated by the beginning of Stage 0. The ensuing negotiations between the parties may take various forms. Here the negotiation process is modeled as follows. Faced with a complaint, D decides whether to settle with C or not. If D chooses to settle, C then decides whether or not to accept D's proposed settlement terms. On the other hand, if D refuses to settle, C then decides whether to continue or withdraw from the litigation process. In reality, settlements in trade negotiations specify changes in policies or practices of D. It is assumed that the effects of such changes can be measured and summarized in monetary terms, the magnitude of which is denoted S . A positive settlement amount ($S > 0$) means D is willing to settle, and S represents a transfer of welfare from D to C as promised by the changes in D's policies.¹⁰ Any zero or negative settlement offer by D is equivalent to D's refusal to settle.

If the dispute is neither settled nor withdrawn, it proceeds to the panel stage (Stage 1). When a case is brought before the panel, the disputing parties face two kinds of uncertainties: the uncertainty regarding the possible panel ruling (violation or no violation) and the uncertainty regarding the quality of the ruling (the degree of legal controversy over the ruling). It is assumed

⁹In other words, it is assumed that the damage or benefit is permanent once the case is filed, but may be terminated before the dispute is escalated to the panel stage.

¹⁰It is recognized that most trade measure changes exhibit non-zero sum natures. Zero sum is assumed here to simplify the analysis. This simplification also applies to the implementation phase of the dispute procedure discussed later.

that countries hold different interpretations about the GATT/WTO law and hence have different subjective predictions about possible panel rulings. This is represented by π_c and π_d , which are the respective probabilities that C and D predict that C's claim will receive a positive ruling. In other words, π_c and π_d are the "types" of C and D in terms of their own views of the likely panel judgement. It is assumed that each country owns some private information which affects their predictions about the panel ruling and therefore one country's type is not known to the other. They each assume that the other's type is uniformly distributed on the closed unit interval $[0, 1]$.

Before the panel, the parties are also uncertain about the quality of the ruling that will be made. Depending on the trade measure in dispute and the GATT/WTO agreements invoked, a panel ruling can be subject to different degrees of legal controversies. Let $L \in [0, 1]$ represent the degree of legal controversy that will arise over a panel ruling, and $f(L|R)$ the probability density function of L given a certain ruling R , where $R = \{0, 1\}$ corresponds to a "no violation" and "violation" ruling, respectively. In other words, $f(L|0)$ is the probability that a certain degree of legal controversy will arise over a "no violation" ruling, and $f(L|1)$ the probability that a certain degree of legal controversy will arise over a "violation" ruling. Intuitively, if the trade measure in dispute is more difficult or sensitive, higher degrees of legal controversies are likely to arise over the panel report. This is represented by a rightward shift in the probability density function $f(L|R)$.

At the panel stage, a panel is established at C's request to hear and rule on the matter.¹¹ Under the GATT procedure, a panel ruling is not binding unless it is adopted by the Contracting Parties with consensus vote. Either party may consider blocking a panel report if faced with an adverse panel ruling. However, the diplomatic cost associated with blocking a report might prevent a country from doing so, unless the report is indeed subject to a large degree of legal controversy. To model this concept, I introduce the notion of blocking cost function $K^b(L)$. For simplification, I assume it takes the shape of a decreasing step function, as illustrated in Figure 2. This function has the simple interpretation that if the degree of legal controversy over a panel ruling is large enough ($L > \bar{L}$), blocking the report is diplomatically permissible and therefore it incurs no cost. Otherwise, the cost is prohibitively high. Whether C decides to block a "no violation" report or not, no changes in D's trade practices will follow. On the other hand, when faced with a "violation"

¹¹I abstract from the issue that the request for a panel might be blocked by D under the GATT. In practice, it was not as serious a problem as the blocking of a panel report, and usually a panel would eventually be established in spite of initial blocking.

ruling, D can potentially avoid the implementation by blocking its adoption. Otherwise, the panel ruling will become binding and D will be obligated to begin the implementation at Stage 2.

Under the WTO procedure, the disputing parties lose their veto power over the panel report; however, they can challenge adverse rulings by resorting to the Appellate Body. For simplification, the cost to appeal a report (such as lawyer fees, etc.) is assumed to be negligible when compared to the value of the disputed trade measure or the political cost at stake. The dispute ends with no changes in D's trade practices if C does not appeal a "no violation" ruling. On the other hand, D is obligated to comply with the panel's recommendation if he does not appeal a "violation" ruling. The case proceeds to the appellate stage (Stage 2) if either party appeals. During the appellate stage, the Appellate Body reviews the legal aspects of the panel report and makes the final ruling on the case, which may reverse the original panel ruling in favor of the other party. I assume that the reversal probability of a panel ruling by the Appellate Body is equal to the degree of legal controversy L over the ruling. In other words, the higher is the degree of legal controversy over a panel ruling, the more likely is the decision to be reversed by the Appellate Body. The appellate review is enforceable if a "violation" ruling against D is made. The implementation is assumed to take place beginning Stage 3.

Under the GATT or WTO procedure, if a "violation" ruling is adopted, the defending country is obligated to remove the confirmed trade barrier. In case of non-implementation, parties can also negotiate compensations (under the WTO). As a last resort, C can be authorized to retaliate by withdrawing tariff concessions of value equivalent to C's welfare loss due to D's trade barrier.¹² In any of these outcomes, there will be a positive welfare transfer from D to C in every period. Let V denote this equivalent value in these three possible implementation outcomes.¹³ Both C and D are assumed to have a common discount factor of δ per period of time, where each stage of the process takes one period.

¹²I have abstracted from the potential enforcement problem where the complainant does not or can not retaliate after the defendant fails to comply with the panel's recommendations. This is beyond the scope of the paper and the extension is left for future work. However, as documented in Hudec (1993, p. 278), 90% of cases with violation rulings were implemented in compliance with panel's recommendations under the GATT. If we take into account that some violation rulings were blocked, the compliance rate with "adopted" panel reports is even higher.

¹³See footnote 15.

4 Theoretical Model and Implications

The theoretical framework of dispute settlement introduced above exhibits the structure of a dynamic game with two-sided incomplete information. The game can be solved backward starting from the panel stage. I first examine countries' incentives to block (appeal) panel reports under the GATT (WTO) regime at the panel stage, and then study their strategic interactions at the consultation stage. The perfect Bayesian equilibrium concept is used in deriving the results.

4.1 Panel Stage

Under the GATT procedure, after the panel report is issued and its quality revealed, the disputing parties may consider blocking an adverse ruling given its degree of legal controversy. The benefit for D to block a “violation” ruling is to avoid changing the trade measure in dispute, which has a continuation value of $\frac{V}{1-\delta}$. Taking into account the diplomatic cost of blocking a report $K^b(L)$, D will block the report if and only if the legal controversy over the report exceeds the threshold level ($L > \bar{L}$). Therefore, *ex ante* the probability that a “violation” ruling will be blocked by D is $1 - F(\bar{L}|1)$, where $F(L|1)$ is the cumulative distribution function associated with $f(L|1)$. This probability is indicated by the solid shaded area under $f(L|1)$ for the GATT procedure in Figure 2. On the other hand, C has no incentive to exercise his blocking power given a “no violation” ruling, regardless of the quality of the report, because no economic benefits will accrue (no changes in D's trade practices will follow the blocking) but the blocking cost is non-negative. Therefore, *ex ante* the probability that a “no violation” ruling will be blocked by C is 0.

Under the WTO with the new appellate procedure, the benefits and costs for disputing parties to challenge a panel ruling have changed as well. The expected benefit for D to appeal against a “violation” ruling is $V + L\frac{\delta}{1-\delta}V$, where the first term is the gain in delaying the implementation for one period during which the appellate process takes place and the second term is the gain that the “violation” ruling may be reversed with probability L and D can avoid the implementation completely. The expected benefit of appeal increases if the panel report is subject to a higher degree of controversy. This relationship is indicated in Figure 2 under the WTO procedure. On the other hand, when C faces a “no violation” ruling, the expected benefit of appeal is $L\frac{\delta}{1-\delta}V$, which is the gain that the “no violation” ruling may be reversed with probability L and changes in D's

trade measure are required. Since the cost of appeal is assumed to be negligible, both C and D will always appeal regardless of L . Therefore, *ex ante* the probability of a ruling being appealed is 1. This is indicated by the solid shaded area under $f(L|1)$ and $f(L|0)$ for the WTO procedure in Figure 2.

We summarize some observations regarding the disputing parties' incentives to block (appeal) panel reports in the following proposition.

Proposition 1 *(a) There exists asymmetric disadvantage against the complainant under both the GATT and WTO dispute settlement mechanisms; (b) The disadvantage against the complainant is diminished under the WTO procedure compared to the GATT procedure, but is not totally eliminated; (c) The frequency of appeal under the WTO overall should be much higher than the frequency of panel reports being blocked under the GATT; (d) If the level of legal controversy increases overall, the frequency of panel reports being blocked under the GATT will increase.*

Proof. (a) It is straightforward to see this by comparing the potential benefit and cost for C and D to block/appeal an adverse ruling under the GATT/WTO. The potential benefit for C to block or appeal an adverse ruling is uniformly less than D, while the same structure of cost applies to both parties. (b) The disadvantage against C is smaller under the WTO (V) than under the GATT ($\frac{V}{1-\delta}$), but still exists. (c) As indicated in Figure 2, the frequency of appeal under the WTO ($= 1$) is higher than the frequency of panel reports being blocked under the GATT ($\ll 1$).¹⁴ (d) An increase in the overall level of legal controversy can be represented by a rightward shift in the probability density function, $f(L|R) \rightarrow f'(L|R)$, as illustrated in Figure 2. This will lead to an increase in the frequency of panel reports being blocked under the GATT, as indicated by the dotted shaded area. Q.E.D.

The data on the GATT/WTO dispute settlement mechanism, as shown in Table 1, indicate that under the GATT regime, the defendant blocked the report at a higher frequency than the complainant given an adverse ruling. This may be explained to some extent by the asymmetric disadvantage against the complainant as claimed above. Table 1 also indicates that the frequency

¹⁴The model's simplifying assumption that the cost of appeal is negligible has led to the strong prediction that all panel reports under the WTO will be appealed. With some small amount of appellate cost, panel reports will not always be appealed.

of appeal under the WTO (70%) is much higher than the frequency of panel reports being blocked under the GATT (12.5%). Finally, we see in Table 1 that under the GATT regime, there was a surge in the frequency of blocked panel reports in the 1980s compared to previous decades. This may be explained by the fact that the panel reports during the 1980s were subject to a higher degree of legal controversy, which according to Proposition 1 leads to a higher frequency of blocking. As introduced in Section 2, the Tokyo Round negotiations produced several new “MTN Codes.” These Codes broadened the GATT’s scope significantly and submitted more contentious and sensitive nontariff trade measures to international discipline. In general, it would be more difficult to rule on the legitimacy of a nontariff measure than on a technical tariff measure. Therefore, we would expect the panel reports to be subject to a higher degree of legal controversy overall in the 1980s following the Tokyo Round.

The proposition that the disputes invoking “MTN Codes” were more complex in nature and induced possibly a higher degree of legal controversy over resulting panel reports and a higher frequency of blocking, can be further supported by the statistics shown in Table 3. In Table 3, we see that the disputes invoking “MTN Codes” were blocked at a much higher frequency (58%) than the overall complaints (21%) during the 1980s, confirming that the “MTN Codes” were the major contributing factor of the increase in blocked cases.

4.2 Consultation Stage

We now proceed to the consultation stage. I first discuss the complainant’s decision to continue or withdraw from the litigation if the defendant refuses to settle, and to accept or reject a settlement offer if the defendant proposes to settle. Given the complainant’s strategy of paneling, I then analyze the defendant’s settlement strategy. Finally, I derive the complainant’s decision of whether to file the dispute or not, given the defendant’s strategy of settlement. The equilibrium solution is derived for the GATT regime, although similar analysis can be carried out for the WTO regime.

As illustrated in Figure 1, if C files the complaint, the dispute will end up in one of the three outcomes: ruled by the panel, withdrawn, or settled. Under the GATT regime, prior to the panel, C predicts that the panel will give a “violation” ruling with probability π_c and that the ruling will be adopted successfully with probability $F(\bar{L}|1)$. In this case, C will receive the compensation-equivalent value of V in every period from the beginning of stage 2. C also predicts a probability

$1 - \pi_c$ of losing the case and receiving nothing. Once the case is filed, C also has to incur the political cost K^f in every period. Therefore, the expected welfare change in present value for C from a panel procedure is $E\Delta W_c^p = \pi_c F(\bar{L}|1) \frac{\delta^2}{1-\delta} V - \frac{1}{1-\delta} K^f$. From D's perspective, D predicts a probability π_d that C will prevail in the trial and a chance $F(\bar{L}|1)$ that he will not block the ruling. Therefore, D's expected welfare change from the panel procedure is $E\Delta W_d^p = -\pi_d F(\bar{L}|1) \frac{\delta^2}{1-\delta} V$. If the case is withdrawn, C incurs the political cost K^f for the period the case is present. Therefore, $\Delta W_c^w = -K^f$. On the other hand, if C withdraws the dispute, D maintains its status quo welfare: $\Delta W_d^w = 0$. If the case is settled at the terms S in present value, C receives the settlement amount but also incurs the political cost K^f for the period the case is present. Therefore, the payoff to C is $\Delta W_c^s = S - K^f$. The payoff to D by settling at the terms S , compared to the status quo welfare, is $\Delta W_d^s = -S$.

Complainant's decision to continue or withdraw from the litigation:

If D does not offer to settle, C has to decide whether to continue or withdraw the complaint. A complainant is indifferent between the two if the expected payoff from the panel $E\Delta W_c^p$ equals that of withdrawal ΔW_c^w . That is,

$$\begin{aligned}
 \pi_c F(\bar{L}|1) \frac{\delta^2}{1-\delta} V - \frac{1}{1-\delta} K^f &= -K^f, \\
 \Rightarrow \pi_c &= \frac{K^f}{\delta F(\bar{L}|1) V} \equiv \tilde{\pi}_c.
 \end{aligned} \tag{1}$$

A complainant with $\pi_c \geq \tilde{\pi}_c$ expects a higher payoff from the panel proceedings, and therefore will choose to continue the litigation. On the other hand, a complainant with $\pi_c < \tilde{\pi}_c$ will withdraw the case. The threshold type $\tilde{\pi}_c$ as defined in (1) is the ratio of the political cost incurred by C relative to the value of the disputed trade measure, discounted by blocking probability and time lag in implementation. As $\tilde{\pi}_c$ increases, the dispute is politically more costly, relative to potential economic benefit, for the complainant to pursue. Therefore, there is less likelihood $(1 - \tilde{\pi}_c)$ that the complainant will proceed to the panel if the defendant refuses to settle. In this sense, the threshold value $\tilde{\pi}_c$ can be interpreted as an indicator of the degree of power politics at play.

Complainant's decision to accept or reject a settlement offer:

If D offers to settle at the terms S , C is indifferent between accepting and rejecting the offer if the expected payoff from the panel proceedings is equal to the payoff from the settlement. The

threshold level of π_c such that $E\Delta W_c^p = \Delta W_c^s$ is:

$$\begin{aligned} \pi_c F(\bar{L}|1) \frac{\delta^2}{1-\delta} V - \frac{1}{1-\delta} K^f &= S - K^f \\ \Rightarrow \pi_c &= \frac{1-\delta}{\delta^2 F(\bar{L}|1) V} S + \tilde{\pi}_c \equiv \pi_c(S) \end{aligned} \quad (2)$$

A complainant with $\pi_c \geq \pi_c(S)$ is sufficiently optimistic about the panel ruling, and thus will continue the litigation. On the other hand, a complainant with $\pi_c < \pi_c(S)$ will opt to accept the offer S . The threshold type $\pi_c(S)$ is therefore the highest type of C that will agree to settle at the terms S if offered by the defendant.

Defendant's settlement strategy:

Taking into account C's strategy of paneling as characterized by $\tilde{\pi}_c$ and $\pi_c(S)$, D decides on the settlement offer, given his type π_d . Suppose D's belief about the lowest type of C (C with the least optimistic prediction about panel rulings) that will file a complaint is $\underline{\pi}_c^b$. By proposing a settlement offer S , D expects $\pi_c \in [\underline{\pi}_c^b, \pi_c(S)]$ to accept the offer, while $\pi_c \in [\pi_c(S), 1]$ to reject the offer and proceed to the panel stage. Therefore, D's expected payoff from proposing an offer S is:

$$E\Delta W_d(S) = -[\pi_c(S) - \underline{\pi}_c^b]S - [1 - \pi_c(S)]\bar{S}_d, \quad \text{for } \max\{\underline{\pi}_c^b, \tilde{\pi}_c\} \leq \pi_c(S) \leq 1 \quad (3)$$

where $\bar{S}_d = -E\Delta W_d^p$ is the expected welfare loss from the panel proceedings. The defendant has no incentive to offer more than enough to settle with all possible types of C such that $\pi_c(S) > 1$. For offers S such that $\pi_c(S) < \max\{\underline{\pi}_c^b, \tilde{\pi}_c\}$, they are equivalent to D's refusal to settle. To see this, note that offers S proposed by D such that $\pi_c(S) < \tilde{\pi}_c$ correspond to negative offers, $S < 0$, and are equivalent to no settlement. For offers S proposed by D such that $\pi_c(S) < \underline{\pi}_c^b$, the offers are not large enough to settle with any type of C that files, so they are equivalent to no settlement as well. In the case without settlement, the complainant who files ($\pi_c \geq \underline{\pi}_c^b$) and who has enough confidence of winning ($\pi_c \geq \tilde{\pi}_c$) continues the litigation. Thus, the defendant's expected payoff is $E\Delta W_d(S) = -[1 - \max\{\underline{\pi}_c^b, \tilde{\pi}_c\}]\bar{S}_d$, for $\pi_c(S) < \max\{\underline{\pi}_c^b, \tilde{\pi}_c\}$.

We are ready to characterize the defendant's settlement strategy. Suppose S^e is the unconstrained optimal solution to $E\Delta W_d(S)$ in (3). Use the first-order condition: $\frac{\partial E\Delta W_d}{\partial S} = -[\frac{\partial \pi_c(S)}{\partial S}(S -$

$\bar{S}_d) + \pi_c(S) - \underline{\pi}_c^b] = 0$ and the definition of $\pi_c(S)$ and \bar{S}_d . It is straightforward to show that

$$S^e = \frac{1}{2} \frac{\delta^2 F(\bar{L}|1)V}{1-\delta} (\pi_d - \tilde{\pi}_c + \underline{\pi}_c^b), \quad (4)$$

$$\pi^e \equiv \pi_c(S^e) = \frac{1}{2} (\pi_d + \tilde{\pi}_c + \underline{\pi}_c^b). \quad (5)$$

Note from (4) that the defendant's optimal offer rises as he is more pessimistic about panel judgement (higher π_d). The offer also increases if he believes he is facing a potentially stronger opponent (higher $\underline{\pi}_c^b$). On the other hand, the defendant's optimal offer decreases if the dispute is more costly for the complainant to pursue (higher $\tilde{\pi}_c$) and there is less likelihood that the complainant will proceed to the panel if the defendant refuses to settle. As argued in the previous paragraph, the optimal offer S^e is truncated below at $\pi^e = \max\{\tilde{\pi}_c, \underline{\pi}_c^b\}$, where settlement fails, and above at $\pi^e = 1$, where the defendant has no incentives to further increase the settlement offer. It follows from (5) that a defendant relatively optimistic about panel judgement with $\pi_d \in [0, |\tilde{\pi}_c - \underline{\pi}_c^b|]$ will opt not to settle. On the other hand, a defendant relatively pessimistic with $\pi_d \in [|\tilde{\pi}_c - \underline{\pi}_c^b|, 1]$ will offer to settle following the optimal offer S^e . If $\tilde{\pi}_c + \underline{\pi}_c^b > 1$, the defendant's settlement scheme π^e is truncated above and all types of D with $\pi_d \in [2 - \tilde{\pi}_c - \underline{\pi}_c^b, 1]$ settle at the upper bound $\pi^e = 1$, which corresponds to an offer of $S^e = \delta^2 F(\bar{L}|1)V(1 - \tilde{\pi}_c)/(1 - \delta)$.

Complainant's filing decision and equilibrium outcomes:

Given D's strategy of settlement as characterized above, C decides whether to file the complaint or not. C's filing decision can be conveniently characterized by $\underline{\pi}_c^e$, which is the lowest type of C that will file a complaint at equilibrium. By perfect Bayesian equilibrium concept, D's belief should be consistent with C's strategy at equilibrium; therefore, the condition $\underline{\pi}_c^b = \underline{\pi}_c^e$ holds at equilibrium.

Given the presence of two-sided asymmetric information, it is likely for a complainant with $\pi_c < \tilde{\pi}_c$ to file a dispute. These types of C face a probability that D will not settle and as a result they will have to withdraw the case and incur loss. However, there is some probability that D might settle. If the prospect of a settlement and the magnitude of the settlement offer are large enough so that the overall expected payoff from filing is nonnegative, this justifies their decision to file the complaint. This type of equilibrium corresponds to $\underline{\pi}_c^e < \tilde{\pi}_c$. On the other hand, under certain parameters, another type of equilibrium $\underline{\pi}_c^e \geq \tilde{\pi}_c$ may arise, where all types of C that file will proceed to the panel unless a settlement is achieved. Figure 3 illustrates all the possible

scenarios, where panels “FW1–3” represent three types of equilibria which include the possibility of withdrawal, and panels “FP1–3” represent three types of equilibria which do not.

In each panel, the type of defendant π_d and the type of complainant π_c are indicated on the horizontal and vertical axis, respectively. In scenarios “FW1–3”, the lowest type of C that will file a complaint is smaller than the threshold type ($\underline{\pi}_c^e < \tilde{\pi}_c$). Following our analysis earlier, the defendant does not settle if $\pi_d \in [0, \tilde{\pi}_c - \underline{\pi}_c^e]$, and offers to settle according to the optimal scheme S^e if $\pi_d \in [\tilde{\pi}_c - \underline{\pi}_c^e, 1]$. The highest type of C that will accept D’s offer S^e is illustrated by the linear schedule π^e . In “FW3”, where $\tilde{\pi}_c + \underline{\pi}_c^e > 1$, the linear schedule π^e is truncated above and all types of D with $\pi_d \in [2 - \tilde{\pi}_c - \underline{\pi}_c^e, 1]$ offers to settle at the upper bound $\pi^e = 1$. In scenarios “FP1–3”, the lowest type of C that will file a complaint is larger than the threshold type ($\underline{\pi}_c^e \geq \tilde{\pi}_c$). The defendant’s settlement strategy can be similarly illustrated by the linear schedule π^e , with the lower truncation point of not settling for the defendant replaced by $\pi_d = \underline{\pi}_c^e - \tilde{\pi}_c$.

In each type of possible equilibrium, different outcomes emerge depending on the types of the disputing parties: π_c and π_d . These are indicated in Figure 3. The possible outcomes are: “ nf ”, where the complainant does not file the case; “ w ”, where the complainant files and then withdraws the case; “ s ”, where the complainant files the case and achieves a settlement with the defendant; and “ p ”, where the complainant files the case and the case proceeds to a panel.

Take “FW2” for example. In this equilibrium, a complainant with $\pi_c \in [0, \underline{\pi}_c^e]$ will not file the case, while a complainant with $\pi_c \in [\underline{\pi}_c^e, 1]$ will file the case. If the complainant files the case, a defendant with $\pi_d \in [0, \tilde{\pi}_c - \underline{\pi}_c^e]$ will not settle; in response, a complainant with $\pi_c \in [\underline{\pi}_c^e, \tilde{\pi}_c]$ will withdraw, while a complainant with $\pi_c \in [\tilde{\pi}_c, 1]$ will proceed to a panel. On the other hand, in response to the complaint, a defendant with $\pi_d \in [\tilde{\pi}_c - \underline{\pi}_c^e, 1]$ will offer to settle according to the scheme S^e , which a complainant with $\pi_c \in [\underline{\pi}_c^e, \pi^e]$ will accept and a complainant with $\pi_c \in [\pi^e, 1]$ will reject and proceed to a panel. The size of the region for each outcome measures the likelihood of each outcome, since the types of the two disputing parties are assumed to be uniformly distributed on the closed unit intervals $[0, 1]$.

We now characterize the equilibrium. Let $E\Delta W_c^f(\pi_c)$ denote the expected payoff from filing a dispute for a complainant of type π_c . Given D’s strategy of settlement, a complainant calculates its expected payoff from filing the dispute by evaluating the likelihood of each of the three possible procedural outcomes (withdrawal, settlement, ruling) and their associated payoffs. Note that

$E\Delta W_c^f(\pi_c)$ is a non-decreasing function of π_c . The equilibrium lower bound for the type of C that will file a dispute, $\underline{\pi}_c^e$, is determined by the zero cutoff condition, $E\Delta W_c^f(\underline{\pi}_c^e) = 0$, for $\underline{\pi}_c^e \in (0, 1)$. If $E\Delta W_c^f(\underline{\pi}_c^e) > 0$, lower types of C with $\pi_c < \underline{\pi}_c^e$ will have incentives to file the dispute, which contradicts the definition of $\underline{\pi}_c^e$. On the other hand, if $E\Delta W_c^f(\underline{\pi}_c^e) < 0$, the complainant $\underline{\pi}_c^e$ is worse off by filing the case and will choose not to, which again contradicts the definition of $\underline{\pi}_c^e$. The corner solutions $\underline{\pi}_c^e = 0$ and $\underline{\pi}_c^e = 1$ arise respectively if $E\Delta W_c^f(0) \geq 0$ and if $E\Delta W_c^f(1) \leq 0$.

The following proposition summarizes the dependence of the equilibrium scenario on the parameters of the dispute. The detailed derivations are provided in the appendix. In addition to the six equilibrium scenarios illustrated in Figure 3, define “NF” as the equilibrium scenario where the complainant does not file the dispute, regardless of his type.

Proposition 2 *As the relative political cost $\tilde{\pi}_c$ increases for a complainant to pursue a litigation under the GATT, the equilibria “FP1”, “FW1”, “FW2”, “FW3” (“FP2”), “FP3”, and “NF” emerge sequentially, if the discount factor δ is relatively large (small).*

Proof. As shown in the appendix, the condition on $\tilde{\pi}_c$ for the different scenarios of equilibrium to emerge is “FP1”: $\tilde{\pi}_c \leq 0$, “FW1”: $0 < \tilde{\pi}_c < \frac{2-\delta}{\delta} - \frac{2\sqrt{1-\delta}}{\delta}$, “FW2”: $\frac{2-\delta}{\delta} - \frac{2\sqrt{1-\delta}}{\delta} \leq \tilde{\pi}_c < \min\{\frac{\delta}{4(1-\delta)}, \frac{1+\delta}{2\delta} - \frac{\sqrt{1+2\delta-3\delta^2}}{2\delta}\}$, “FW3”: $\frac{1+\delta}{2\delta} - \frac{\sqrt{1+2\delta-3\delta^2}}{2\delta} \leq \tilde{\pi}_c < \frac{2\delta-1}{\delta}$, “FP2”: $\frac{\delta}{4(1-\delta)} \leq \tilde{\pi}_c < \frac{1+\delta}{2\delta} - \frac{\sqrt{1+2\delta-3\delta^2}}{2\delta}$, “FP3”: $\max\{\frac{1+\delta}{2\delta} - \frac{\sqrt{1+2\delta-3\delta^2}}{2\delta}, \frac{2\delta-1}{\delta}\} \leq \tilde{\pi}_c \leq \delta$, and “NF”: $\tilde{\pi}_c > \delta$. For $\delta > \frac{2}{3}$, $\frac{1+\delta}{2\delta} - \frac{\sqrt{1+2\delta-3\delta^2}}{2\delta} < \frac{2\delta-1}{\delta} < \frac{\delta}{4(1-\delta)}$; therefore, “FP2” does not arise. On the other hand, for $\delta < \frac{2}{3}$, $\frac{2\delta-1}{\delta} < \frac{\delta}{4(1-\delta)} < \frac{1+\delta}{2\delta} - \frac{\sqrt{1+2\delta-3\delta^2}}{2\delta}$; therefore, “FW3” is not sustainable. Q.E.D.

Figure 4 illustrates the dependence of the equilibrium scenarios on the parameters $\tilde{\pi}_c$ and δ . The equilibrium “FP1” arises if $\tilde{\pi}_c < 0$, which corresponds to the situation where the international political cost by filing the dispute is smaller than the domestic political benefit ($K^f < 0$) for the complainant. This is likely the case if the dispute involves a powerful complaining country relative to the defendant, and/or attracts strong domestic political support from within the complaining country. The equilibrium “FW1” arises if the relative political cost $\tilde{\pi}_c$ turns positive, and the equilibrium “FW2” appears next if $\tilde{\pi}_c$ increases further. As the relative political cost continues rising, the equilibrium “FW3” (“FP2”) emerges, if the discount factor δ is larger (smaller) than $2/3$, followed by the equilibrium “FP3”. Eventually with even higher $\tilde{\pi}_c$, the equilibrium “NF”

emerges.

Proposition 3 *As the relative political cost $\tilde{\pi}_c$ increases for a complainant to pursue a litigation under the GATT, (a) the incidence of complaints filed ($1 - \underline{\pi}_c^e$) remains constant at first, before decreases monotonically toward zero; (b) the incidence of complaints withdrawn increases at first, before decreases toward zero.*

Proof. (a) As shown in the appendix, the lowest type of complainants that will file a case is “FP1”: $\underline{\pi}_c^e = 0$, “FW1”: $\underline{\pi}_c^e = 0$, “FW2”: $\underline{\pi}_c^e = \tilde{\pi}_c + 2\sqrt{\frac{1-\delta}{\delta}}\sqrt{\tilde{\pi}_c} - 1$, “FW3”: $\underline{\pi}_c^e = \frac{(1-\delta)\tilde{\pi}_c}{\delta(1-\tilde{\pi}_c)}$, “FP2”: $\underline{\pi}_c^e = \tilde{\pi}_c + 2\sqrt{\frac{1-\delta}{\delta}}\sqrt{\tilde{\pi}_c} - 1$, “FP3”: $\underline{\pi}_c^e = \frac{(1-\delta)\tilde{\pi}_c}{\delta(1-\tilde{\pi}_c)}$, and “NF”: $\underline{\pi}_c^e = 1$. Thus, the incidence of complaints filed ($1 - \underline{\pi}_c^e$) remains constant from the equilibrium “FP1” to the equilibrium “FW1”, as $\tilde{\pi}_c$ increases. It is straightforward to show that $\partial\underline{\pi}_c^e/\partial\tilde{\pi}_c > 0$ in the other equilibrium scenarios. Thus, the equilibrium filing threshold $\underline{\pi}_c^e$ increases with the rise in the relative political cost $\tilde{\pi}_c$ through “FW2”, “FW3” (“FP2”), and “FP3”, until it reaches the upper bound $\underline{\pi}_c^e = 1$. The desired result therefore follows. (b) Recall the formula for the equilibrium filing threshold $\underline{\pi}_c^e$ in each of the equilibrium scenarios from above. The incidence of complaints withdrawn can be represented by the region “w” in Figure 3. Since in “FW1”, all types of complainants file ($\underline{\pi}_c^e = 0$), the region “w” increases with the relative political cost $\tilde{\pi}_c$. It can be shown that $\partial(\tilde{\pi}_c - \underline{\pi}_c^e)/\partial\tilde{\pi}_c < 0$ in the rest of equilibrium scenarios. Thus, the incidence of complaints withdrawn decreases as the relative political cost $\tilde{\pi}_c$ increases in “FW2” and “FW3”, and eventually disappears when $\tilde{\pi}_c \leq \underline{\pi}_c^e$ as in “FP2” and “FP3”. The desired result follows. Q.E.D.

When the international political cost by filing a dispute is dominated by domestic political benefit for a complainant as in “FP1”, the expected payoffs from all possible procedural outcomes are positive. Thus, the complainant will file the dispute regardless of his prediction of panel judgement ($\underline{\pi}_c^e = 0$). When the relative political cost $\tilde{\pi}_c$ turns positive but is relatively small as in the scenario “FW1”, it is still sustainable for all types of complainants to file the dispute, and as a result, the higher the relative political cost $\tilde{\pi}_c$, the higher the incidence of complaints withdrawn. As the relative political cost $\tilde{\pi}_c$ continues rising, a complainant not sufficiently optimistic about panel judgement will quit filing ($\underline{\pi}_c^e > 0$) as in “FW2”. The filing threshold $\underline{\pi}_c^e$ increases monotonically with the rise in the relative political cost $\tilde{\pi}_c$ and does so at a faster rate. Thus, the incidence

of complaints withdrawn starts to decrease with the rise in the relative political cost $\tilde{\pi}_c$. This continues through “FW3” until the “withdrawal” outcome disappears, as in “FP2” and “FP3”. With even higher relative political cost, the complainant will not file the dispute regardless of how optimistic he is about panel judgement ($\pi_c^e = 1$), as represented by the scenario “NF”.

Proposition 3 implies that if the population of trade disputes are uniformly distributed across different pairs of subjective predictions (π_c, π_d) , we should observe some systematic patterns of filing and withdrawal, corresponding to different levels of relative political cost $\tilde{\pi}_c$. When the relative political cost $\tilde{\pi}_c$ is very low, a lot of complaints will be filed but relatively few complaints withdrawn (“FW1”). When the relative political cost $\tilde{\pi}_c$ is medium, fewer complaints will be filed but a lot of them withdrawn (“FW2”). When the relative political cost $\tilde{\pi}_c$ is high, even fewer complaints will be filed and relatively few withdrawn (“FW3”). Finally, when the relative political cost becomes so high, very few complaints will be filed and none of them withdrawn (“FP3”).

If we look at the statistics for the GATT regime in Table 2, we see that the pattern of total complaints and cases withdrawn varied across different decades. In the 1950s, 53 trade disputes were brought under the GATT legal system, ten of which were withdrawn. In the 1960s, the system basically fell into a void. Merely seven times was the dispute settlement procedure invoked, and no complaints were withdrawn. In the 1970s, the legal activities seemed to thrive again with 32 new cases filed and five of them withdrawn. This momentum continued into the 1980s when we witnessed a surge in both litigation (115 complaints) and withdrawals (40 cases).

To understand the data, we can apply the results from Proposition 3 and assign to each decade a likely level of relative political cost $\tilde{\pi}_c$ that might be experienced on average by all countries utilizing the GATT dispute settlement system. Judging from the amount of complaints and withdrawn cases in each decade, the magnitude of relative political cost for each decade, from small to large, is likely to be: 1980s, 1950s, 1970s, and 1960s. The corresponding representative equilibrium for these decades is likely to be “FW2”, “FW2/FW3”, “FW3”, and “FP3”, respectively.

As documented by Hudec (1993), the GATT started with a small group of homogeneous countries. Most of them were small European states which were accustomed to using international litigation procedure in resolving conflicts. Therefore, the dispute settlement procedure of the 1950s was dealt with as common practice, with no significant feeling of hostility about it. Therefore, the international political cost of using the GATT dispute settlement procedure in this decade should

not have been too high.

In the 1960's, two major changes occurred to the system: the European Community was established, which replaced the original six smaller states with one larger trade negotiating entity; and the number of developing country members expanded rapidly. Both groups demanded major exemptions from the GATT obligations and the former advocated a diplomatic approach to all policy conflicts, contrary to the formal GATT legal procedure. This "anti-legalist" position prevailed among developed countries, including the US, such that it generated an atmosphere in which formal legal claims were regarded as unfriendly behavior. Therefore, it corresponds to a very high international political cost in the model for initiating a complaint during this decade.

In the 1970s, the GATT began to rebuild its legal system with the Tokyo Round negotiations. The U.S. reversed its antilegalist position, and among other countries there was a gradual awakening of interest in the dispute settlement system. Therefore, we can consider the political cost to have gradually come down in this decade, to the level of the 1950s, and to have continued to decrease throughout the 1980s after the Tokyo Round negotiations. The GATT dispute settlement procedure became a popular device for member countries to resolve trade disputes in this decade. Although we also witnessed earlier that a higher fraction of panel reports were blocked during this decade, and therefore the expected benefits from the litigation procedure for a complainant decreased, the decrease in political costs presumably exceeded the decrease in expected benefits so that overall the relative political cost $\tilde{\pi}_c$ decreased for a complaint during the 1980s.

5 Conclusion

This paper develops a theoretical model to explain the stylized facts observed for the GATT/WTO dispute settlement mechanisms. The paper first studies the effect of legal controversy over a panel ruling on the incentives of countries to block (appeal) a panel report under the GATT (WTO) procedure. The paper then examines the effect of political power on the incentives of countries to use, and their interactions in using, the dispute settlement mechanism, in a framework of two-sided asymmetric information. It is shown that the magnitude of the political cost, relative to potential benefit that a complainant stands to gain from using this mechanism, determines the pattern of filing activity and the frequency of various procedural outcomes. This result, when confronted with

the statistics on disputes in different decades of the GATT regime, provides an indicator of how well the dispute procedure has worked during various decades, in terms of how much this procedure has been subject to potential power politics.

Appendix

This appendix derives the equilibrium conditional on the parameters of the dispute. The parameters of the dispute is summarized by $\tilde{\pi}_c$ and δ . In most of the equilibrium scenarios, the equilibrium filing threshold $\underline{\pi}_c^e$ is derived as a function of the parameters of the dispute. The conditions on the parameters under which a particular equilibrium scenario arises are then derived.

Equilibrium “FP1”: $\tilde{\pi}_c \leq 0$

If $\tilde{\pi}_c \leq 0$, it implies that $K^f \leq 0$ by (1). This represents a situation where the political benefit from domestic support by filing a dispute is larger than the international political cost. In this case, for all $\pi_c \in [0, 1]$, $E\Delta W_c^p \geq \Delta W_c^w = -K^f \geq 0$. Therefore, regardless whether D will offer to settle or not, C’s payoff from all possible procedural outcomes by filing the complaint is nonnegative. In this case, C will file the complaint regardless of his type π_c . This is equivalent to $\underline{\pi}_c^e = 0$.

Equilibrium “FW1”: $0 = \underline{\pi}_c^e < \tilde{\pi}_c$, $E\Delta W_c^f(0) > 0$

This is a scenario with corner solution, where $E\Delta W_c^f(0) > 0$ and C will file the complaint regardless of his type ($\underline{\pi}_c^e = 0$). However, the political cost of filing is positive. The expected payoff from filing for $\pi_c = 0$ is

$$\begin{aligned} E\Delta W_c^f(0) &= \tilde{\pi}_c \Delta W_c^w + \int_{\tilde{\pi}_c}^1 \Delta W_c^s d\pi_d \\ &= \tilde{\pi}_c (-K^f) + \int_{\tilde{\pi}_c}^1 (S^e - K^f) d\pi_d = -K^f + \int_{\tilde{\pi}_c}^1 S^e d\pi_d. \end{aligned}$$

Use the formula S^e in (4) with $\underline{\pi}_c^b = 0$. It is straightforward to show that $E\Delta W_c^f(0) = \frac{1}{4} \frac{\delta F(\bar{L}|1)V}{1-\delta} [-4(1-\delta)\tilde{\pi}_c + \delta(1-\tilde{\pi}_c)^2]$. This is positive if $\tilde{\pi}_c < \frac{2-\delta}{\delta} - \frac{2\sqrt{1-\delta}}{\delta}$. Therefore the condition on the parameters for this equilibrium to emerge is $0 < \tilde{\pi}_c < \frac{2-\delta}{\delta} - \frac{2\sqrt{1-\delta}}{\delta}$.

Equilibrium “FW2”: $0 \leq \underline{\pi}_c^e < \tilde{\pi}_c$, $E\Delta W_c^f(\underline{\pi}_c^e) = 0$, $\tilde{\pi}_c + \underline{\pi}_c^e < 1$

In this scenario, the relative political cost $\tilde{\pi}_c$ is larger, so that some types of complainants will not file the case. For $\pi_c = \underline{\pi}_c^e$, the expected payoff from filing is

$$\begin{aligned} E\Delta W_c^f(\underline{\pi}_c^e) &= (\tilde{\pi}_c - \underline{\pi}_c^e)\Delta W_c^w + \int_{\tilde{\pi}_c - \underline{\pi}_c^e}^1 \Delta W_c^s d\pi_d \\ &= (\tilde{\pi}_c - \underline{\pi}_c^e)(-K^f) + \int_{\tilde{\pi}_c - \underline{\pi}_c^e}^1 (S^e - K^f) d\pi_d = -K^f + \int_{\tilde{\pi}_c - \underline{\pi}_c^e}^1 S^e d\pi_d. \end{aligned}$$

Use the formula S^e in (4) with $\underline{\pi}_c^b = \underline{\pi}_c^e$. We can show that $E\Delta W_c^f(\underline{\pi}_c^e) = \frac{1}{4} \frac{\delta F(\bar{L}|1)V}{1-\delta} [-4(1-\delta)\tilde{\pi}_c + \delta(1-\tilde{\pi}_c + \underline{\pi}_c^e)^2]$. The zero expected payoff condition for $\underline{\pi}_c^e$ implies that $\underline{\pi}_c^e = \tilde{\pi}_c + 2\sqrt{\frac{1-\delta}{\delta}}\sqrt{\tilde{\pi}_c} - 1$.

For this equilibrium to be borne out, the parameters have to satisfy the restrictions $0 \leq \underline{\pi}_c^e < \tilde{\pi}_c$ and $\tilde{\pi}_c + \underline{\pi}_c^e < 1$. With some manipulations, it can be shown that these correspond to the condition:

$$\frac{2-\delta}{\delta} - \frac{2\sqrt{1-\delta}}{\delta} \leq \tilde{\pi}_c < \min\left\{\frac{\delta}{4(1-\delta)}, \frac{1+\delta}{2\delta} - \frac{\sqrt{1+2\delta-3\delta^2}}{2\delta}\right\}.$$

Equilibrium “FW3”: $0 < \underline{\pi}_c^e < \tilde{\pi}_c$, $E\Delta W_c^f(\underline{\pi}_c^e) = 0$, $\tilde{\pi}_c + \underline{\pi}_c^e \geq 1$

In this scenario, the relative political cost $\tilde{\pi}_c$ is even larger ($\tilde{\pi}_c + \underline{\pi}_c^e \geq 1$), such that D’s settlement offer π^e is truncated above at $\pi_d = 2 - \tilde{\pi}_c - \underline{\pi}_c^e$. In this case, the expected payoff from filing for $\pi_c = \underline{\pi}_c^e$ is

$$\begin{aligned} E\Delta W_c^f(\underline{\pi}_c^e) &= (\tilde{\pi}_c - \underline{\pi}_c^e)\Delta W_c^w + \int_{\tilde{\pi}_c - \underline{\pi}_c^e}^{2-\tilde{\pi}_c-\underline{\pi}_c^e} \Delta W_c^s d\pi_d + (\tilde{\pi}_c + \underline{\pi}_c^e - 1)\Delta W_c^s|_{S^e=(1-\tilde{\pi}_c)\frac{\delta^2 F(\bar{L}|1)V}{1-\delta}} \\ &= (\tilde{\pi}_c - \underline{\pi}_c^e)(-K^f) + \int_{\tilde{\pi}_c - \underline{\pi}_c^e}^{2-\tilde{\pi}_c-\underline{\pi}_c^e} (S^e - K^f) d\pi_d + (\tilde{\pi}_c + \underline{\pi}_c^e - 1)\left[(1-\tilde{\pi}_c)\frac{\delta^2 F(\bar{L}|1)V}{1-\delta} - K^f\right] \\ &= -K^f + \int_{\tilde{\pi}_c - \underline{\pi}_c^e}^{2-\tilde{\pi}_c-\underline{\pi}_c^e} S^e d\pi_d + (\tilde{\pi}_c + \underline{\pi}_c^e - 1)(1-\tilde{\pi}_c)\frac{\delta^2 F(\bar{L}|1)V}{1-\delta}. \end{aligned}$$

Use the formula S^e in (4) again with $\underline{\pi}_c^b = \underline{\pi}_c^e$. It can be shown that $E\Delta W_c^f(\underline{\pi}_c^e) = \frac{\delta F(\bar{L}|1)V}{1-\delta} [-(1-\delta)\tilde{\pi}_c + \delta\underline{\pi}_c^e(1-\tilde{\pi}_c)]$. This equals zero if $\underline{\pi}_c^e = \frac{(1-\delta)\tilde{\pi}_c}{\delta(1-\tilde{\pi}_c)}$. Using this equilibrium’s conditions on $\underline{\pi}_c^e$, we can derive the corresponding condition on the parameters. It is: $\frac{1+\delta}{2\delta} - \frac{\sqrt{1+2\delta-3\delta^2}}{2\delta} \leq \tilde{\pi}_c < \frac{2\delta-1}{\delta}$.

Equilibrium “FP2”: $\tilde{\pi}_c \leq \underline{\pi}_c^e$, $E\Delta W_c^f(\underline{\pi}_c^e) = 0$, $\tilde{\pi}_c + \underline{\pi}_c^e < 1$

This is the scenario where the relative political cost $\tilde{\pi}_c$ is so large that $\underline{\pi}_c^e < \tilde{\pi}_c$ is no longer sustainable. Instead, in the equilibrium, $\underline{\pi}_c^e \geq \tilde{\pi}_c$, so that if D refuses to settle, all types of C that

file will proceed to the panel procedure. Note that in this case, the expected payoff from filing for $\pi_c = \underline{\pi}_c^e$ is

$$\begin{aligned} E\Delta W_c^f(\underline{\pi}_c^e) &= (\underline{\pi}_c^e - \tilde{\pi}_c)E\Delta W_c^p + \int_{\underline{\pi}_c^e - \tilde{\pi}_c}^1 \Delta W_c^s d\pi_d \\ &= (\underline{\pi}_c^e - \tilde{\pi}_c)\left(\frac{\delta^2 F(\bar{L}|1)V}{1-\delta}\underline{\pi}_c^e - \frac{1}{1-\delta}K^f\right) + \int_{\underline{\pi}_c^e - \tilde{\pi}_c}^1 (S^e - K^f) d\pi_d. \end{aligned}$$

Use the formula S^e in (4) with $\underline{\pi}_c^b = \underline{\pi}_c^e$. We can show that $E\Delta W_c^f(\underline{\pi}_c^e) = \frac{1}{4}\frac{\delta F(\bar{L}|1)V}{1-\delta}[\delta\underline{\pi}_c^{e2} + 2\delta(1-\tilde{\pi}_c)\underline{\pi}_c^e + \delta\tilde{\pi}_c^2 + (2\delta-4)\tilde{\pi}_c + \delta]$. The zero expected payoff condition for $\underline{\pi}_c^e$ implies that $\underline{\pi}_c^e = \tilde{\pi}_c + 2\sqrt{\frac{1-\delta}{\delta}}\sqrt{\tilde{\pi}_c} - 1$. To support this equilibrium such that $\tilde{\pi}_c \leq \underline{\pi}_c^e$ and $\tilde{\pi}_c + \underline{\pi}_c^e < 1$, the parameters must satisfy the condition that $\frac{\delta}{4(1-\delta)} \leq \tilde{\pi}_c < \frac{1+\delta}{2\delta} - \frac{\sqrt{1+2\delta-3\delta^2}}{2\delta}$.

Equilibrium “FP3”: $\tilde{\pi}_c \leq \underline{\pi}_c^e$, $E\Delta W_c^f(\underline{\pi}_c^e) = 0$, $\tilde{\pi}_c + \underline{\pi}_c^e \geq 1$

In this scenario, the relative political cost is too large to support $\underline{\pi}_c^e < \tilde{\pi}_c$, and is so large that the defendant’s settlement scheme π^e is truncated above at $\pi_d = 2 - \tilde{\pi}_c - \underline{\pi}_c^e$. In this case, the expected payoff from filing for $\pi_c = \underline{\pi}_c^e$ is

$$\begin{aligned} E\Delta W_c^f(\underline{\pi}_c^e) &= (\underline{\pi}_c^e - \tilde{\pi}_c)E\Delta W_c^p + \int_{\underline{\pi}_c^e - \tilde{\pi}_c}^{2-\tilde{\pi}_c-\underline{\pi}_c^e} \Delta W_c^s d\pi_d + (\tilde{\pi}_c + \underline{\pi}_c^e - 1)\Delta W_c^s|_{S^e=(1-\tilde{\pi}_c)\frac{\delta^2 F(\bar{L}|1)V}{1-\delta}} \\ &= (\underline{\pi}_c^e - \tilde{\pi}_c)\left(\frac{\delta^2 F(\bar{L}|1)V}{1-\delta}\underline{\pi}_c^e - \frac{1}{1-\delta}K^f\right) + \int_{\underline{\pi}_c^e - \tilde{\pi}_c}^{2-\tilde{\pi}_c-\underline{\pi}_c^e} (S^e - K^f) d\pi_d + (\tilde{\pi}_c + \underline{\pi}_c^e - 1)\left[(1-\tilde{\pi}_c)\frac{\delta^2 F(\bar{L}|1)V}{1-\delta} - K^f\right]. \end{aligned}$$

We can use the formula of S^e in (4) again with $\underline{\pi}_c^b = \underline{\pi}_c^e$ to show that $E\Delta W_c^f(\underline{\pi}_c^e) = \frac{\delta F(\bar{L}|1)V}{1-\delta}[\delta(1-\tilde{\pi}_c)\underline{\pi}_c^e - (1-\delta)\tilde{\pi}_c]$. The condition that $E\Delta W_c^f(\underline{\pi}_c^e) = 0$ implies that $\underline{\pi}_c^e = \frac{(1-\delta)\tilde{\pi}_c}{\delta(1-\tilde{\pi}_c)}$. Using this equilibrium’s conditions on $\underline{\pi}_c^e$, we can derive the corresponding condition on the parameters. It is: $\max\{\frac{1+\delta}{2\delta} - \frac{\sqrt{1+2\delta-3\delta^2}}{2\delta}, \frac{2\delta-1}{\delta}\} \leq \tilde{\pi}_c \leq \delta$.

Equilibrium “NF”: $\tilde{\pi}_c > \delta$

When $\tilde{\pi}_c$ is larger than δ , it can be shown that the various procedural outcomes will all render C negative payoffs regardless of his type π_c . First of all, note that $E\Delta W_c^p = 0$ when $\pi_c = \frac{\tilde{\pi}_c}{\delta}$. It follows that if $\tilde{\pi}_c > \delta$, all $\pi_c \in [0, 1]$ will have negative expected payoff from the panel procedure. Second, since $\tilde{\pi}_c > \delta > 0$, the political cost of filing (K^f) is positive. Therefore, the payoff from filing and withdrawing a case is negative ($\Delta W_c^w = -K^f < 0$) for all types of C. Third, even if D is willing to settle at the upper bound $\pi^e = 1$, the payoff to C is $\Delta W_c^s = S^e - K^f = (1-\tilde{\pi}_c)\frac{\delta^2 F(\bar{L}|1)V}{1-\delta} - K^f =$

$\frac{\delta^2 F(\bar{L}|1)V}{1-\delta}(1 - \frac{\tilde{\pi}_c}{\delta})$, which is negative if $\tilde{\pi}_c > \delta$. In sum, if C files, the expected payoffs are negative in all possible outcomes. Therefore, C will not file the complaint regardless of his type π_c . This scenario can be represented as $\pi_c^e = 1$.

References

- Bebchuk, L. A., 1988. Suing solely to extract a settlement offer. *Journal of Legal Studies* 17, 437–450.
- Bown, C. P., 2002a. The economics of trade disputes, the GATT's Article XXIII, and the WTO's Dispute Settlement Understanding. Forthcoming in *Economics and Politics*.
- , 2002b. Why are safeguards under the WTO so unpopular? *World Trade Review* 1, 47–62.
- Busch, M. L., 2000. Democracy, consultation, and the paneling of disputes under GATT. *Journal of Conflict Resolution* 44, 425–446.
- Bütler, M., Hauser, H., 2000. The WTO dispute settlement system: A first assessment from an economic perspective. *Journal of Law, Economics, & Organization* 16, 503–533.
- Horn, H., Mavroidis, P. C., Nordström, H., 1999. Is the use of the WTO dispute settlement system biased? CEPR 2340.
- Hudec, R. E., 1993. *Enforcing International Trade Law: The Evolution of the Modern GATT Legal System*. Butterworth Legal Publishers, New Hampshire.
- , 1999. The new WTO dispute settlement procedure: An overview of the first three years. *Minnesota Journal of Global Trade* 8, 1–53.
- Jackson, J. H., 1997. *The World Trading System*. The MIT press, Cambridge.
- , 2000. *The Jurisprudence of GATT and the WTO*. Cambridge University Press, Cambridge.
- Leitner, K., Lester, S., 2006. WTO dispute settlement from 1995 to 2005: A statistical analysis. *Journal of International Economic Law* 9, 219–231.
- Nalebuff, B., 1987. Credible pretrial negotiation. *Rand Journal of Economics* 18, 199–210.

P'ng, I. P. L., 1983. Strategic behavior in suit, settlement, and trial. *Bell Journal of Economics* 14, 539–550.

WTO, 2005. Update of WTO Dispute Settlement Cases (WT/DS/OV/25). The World Trade Organization, Geneva.

Table 1: Incidence of Panel Reports Blocked/Appealed under the GATT/WTO

Regimes	Pre-Tokyo Round			Post-Tokyo Round	WTO
Decades	1950s	1960s	1970s	1980s	1995–2005
Total Rulings	21	5	15	47	105
(No Violation)	(6)	(0)	(7)	(7)	
(Violation)	(15)	(5)	(8)	(40)	
(Blocked by C)	(0)	(0)	(0)	(2)	
(Blocked by D)	(1)	(0)	(0)	(8)	
Blocked/Appealed	1	0	0	10	74
Percentage of Total Rulings	5%	0%	0%	21%	70%

Note 1: For the GATT era, the data on “Total Rulings” and outcomes of rulings, “No Violation/Violation,” were compiled from Hudec (1993, p. 289).

Note 2: For the GATT era, the blocked cases were identified from the Database of Hudec (1993) as follows. Cases with “Procedure” entry of “4” AND “Plenary Action” entry of “1.2”, “1.8”, or “2.3” were first selected from Database Part II (pp. 588–608). Among them, whose panel reports were actually blocked were then identified using the information in Database Part I (pp. 417–585). The identified cases are Complaints 42, 103, 105, 107, 113, 132, 137, 149, 185, 191, 196.

Note 3: The DISC case and its three counter-claims (Complaints 69–72, filed in 1973) were not included in the blocked cases. Their panel rulings were blocked at first but eventually the Council were able to reach decisions in 1982.

Note 4: The data for the WTO era were taken from Leitner and Lester (2006). The numbers (as of 14 February 2006) excluded circulated panel reports where the deadline for appeal had not expired at the above time.

Table 2: Procedural Outcomes of Complaints Filed under the GATT and WTO

Regimes	Pre-Tokyo Round			Post-Tokyo Round	WTO
Decades	1950s	1960s	1970s	1980s	1995-2005
Total Complaints	53	7	32	115	335
Cases in Progress					159
Rulings	21 (40%)	5 (71%)	15 (47%)	47 (41%)	95 (54%)
Settled	22 (42%)	2 (29%)	12 (38%)	28 (24%)	52 (30%)
Withdrawn or Abandoned	10 (19%)	0 (0%)	5 (16%)	40 (35%)	29 (16%)

Note 1: The data were compiled from Hudec (1993, p. 287) and WTO (2005, p. iii) for complaints filed under the GATT and the WTO regimes, respectively. WTO (2005) registers the number of *Panel Reports Adopted* (as of 1 December 2005) instead of *Panel Reports Circulated*. This contributes to the discrepancy in the numbers of Rulings between Table 1 and Table 2.

Note 2: The percentages in brackets refer to the frequency of a certain procedural outcome with respect to total complaints (which are completed).

Table 3: Overall Complaints v.s. Complaints Invoking MTN Codes During the 1980's

Procedural Outcomes	Overall	MTN Codes	Blocking Incidence	Overall	MTN Codes
Total Complaints	115	35	Total Rulings	47	12
Rulings	47 (41%)	12 (34%)	(No Violation)	(7)	(2)
Settled	28 (24%)	8 (23%)	(Violation)	(40)	(10)
Withdrawn/Abandoned	40 (35%)	15 (43%)	(Blocked by C)	(2)	(2)
			(Blocked by D)	(8)	(5)
			Blocked	10	7
			% of Total Rulings	21%	58%

Note 1: The data on "Overall" complaints during the 1980's were compiled from Hudec (1993) as explained in the notes to Table 1 and Table 2.

Note 2: The data on "MTN Codes" complaints were identified from the Database Part II (pp. 588-608) of Hudec (1993) as follows. The cases invoking "MTN Codes" were identified by the column "Legal Provisions". They are Complaints 97, 99, 103, 105, 106, 109, 111, 114, 115, 121, 123, 126, 128, 130, 134, 136, 137, 142, 147, 149, 151, 158, 159, 164, 165, 185, 188, 190, 191, 192, 196, 197, 203, 204, 205. Their procedural outcomes were then identified using the following method. Cases with "Procedure" entry of "4" OR "Plenary Action" entry of "3" were identified as cases with "Rulings"; cases with "Plenary Action" entry of "1" BUT NOT "Procedure" entry of "4" were identified as cases "Withdrawn/Abandoned"; the remainder were cases "Settled". This classification was verified to reach the same aggregate number of procedural outcomes for overall complaints as reported by Hudec (1993).

Note 3: Blocked cases which invoked "MTN Codes" could be easily identified by comparing the list of blocked cases (note 2 to Table 1) and the list of "MTN Codes" cases (note 2 above). They are Complaints 103, 105, 137, 149, 185, 191, 196.

Figure 1: Game Tree of the GATT/WTO Dispute Settlement Procedure

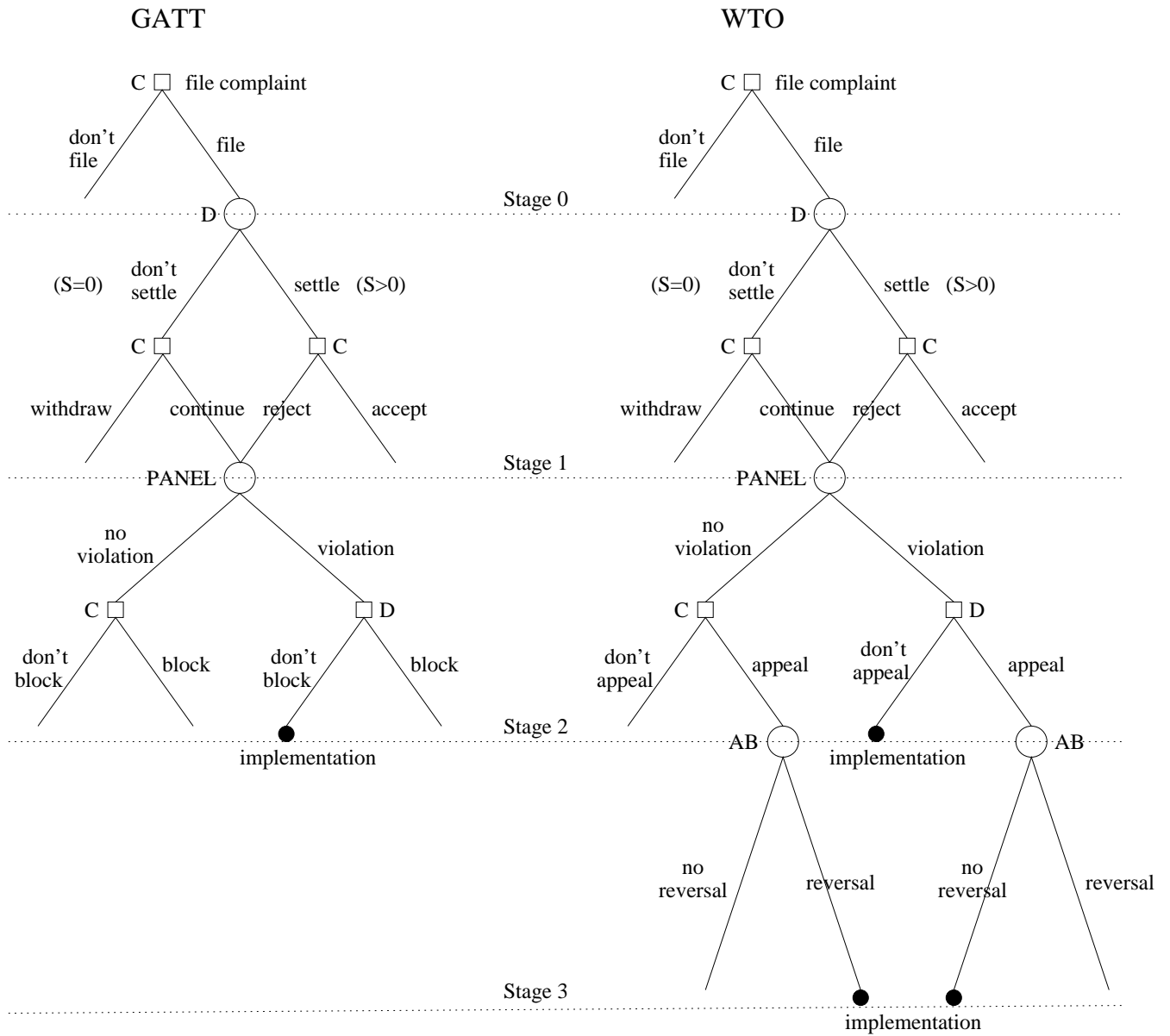


Figure 2: Incentives and Frequencies of Disputing Parties to Block/Appeal a Panel Report

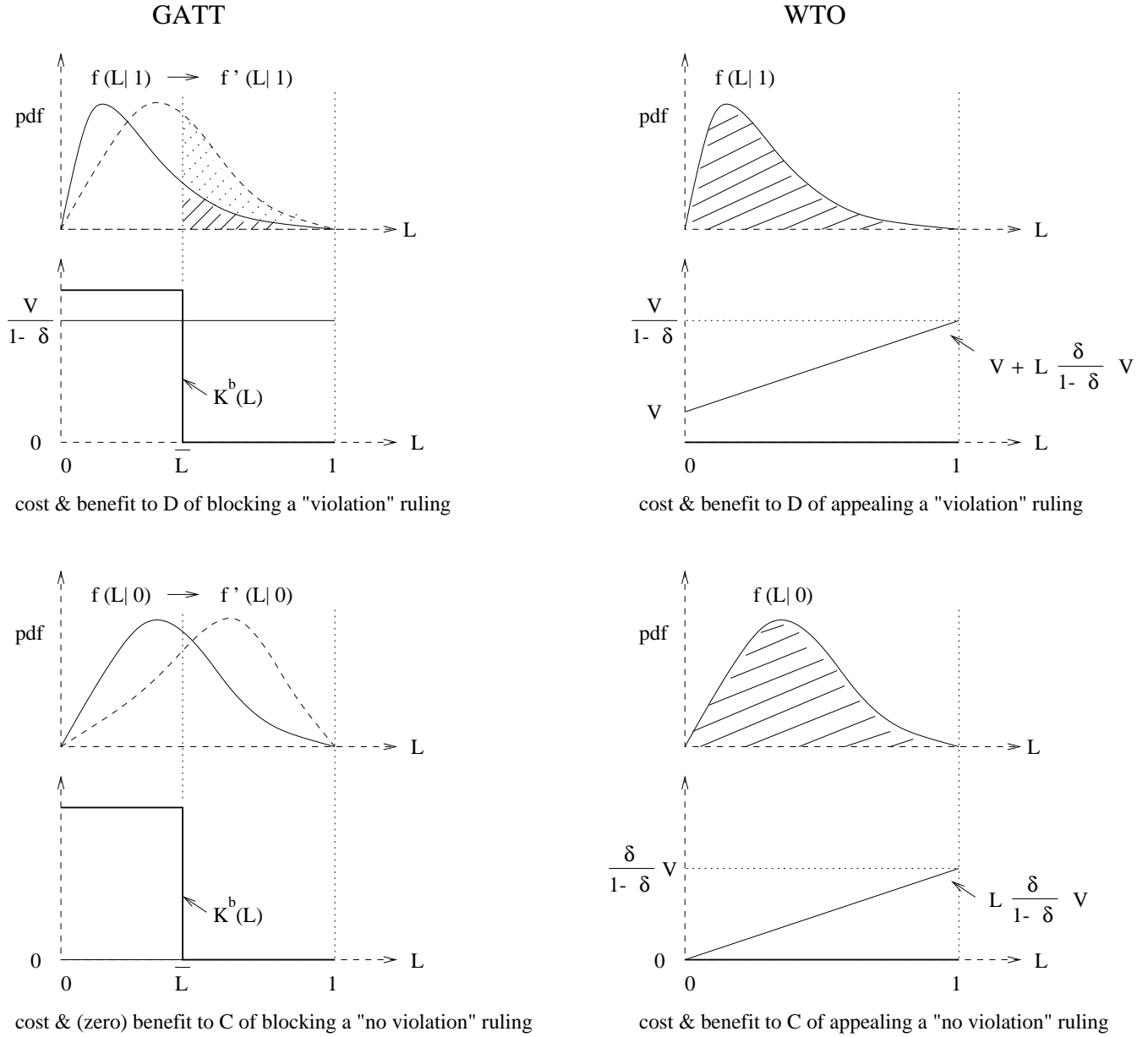


Figure 3: Equilibrium Scenarios as $\tilde{\pi}_c$ Varies ($\tilde{\pi}_c < \delta$)

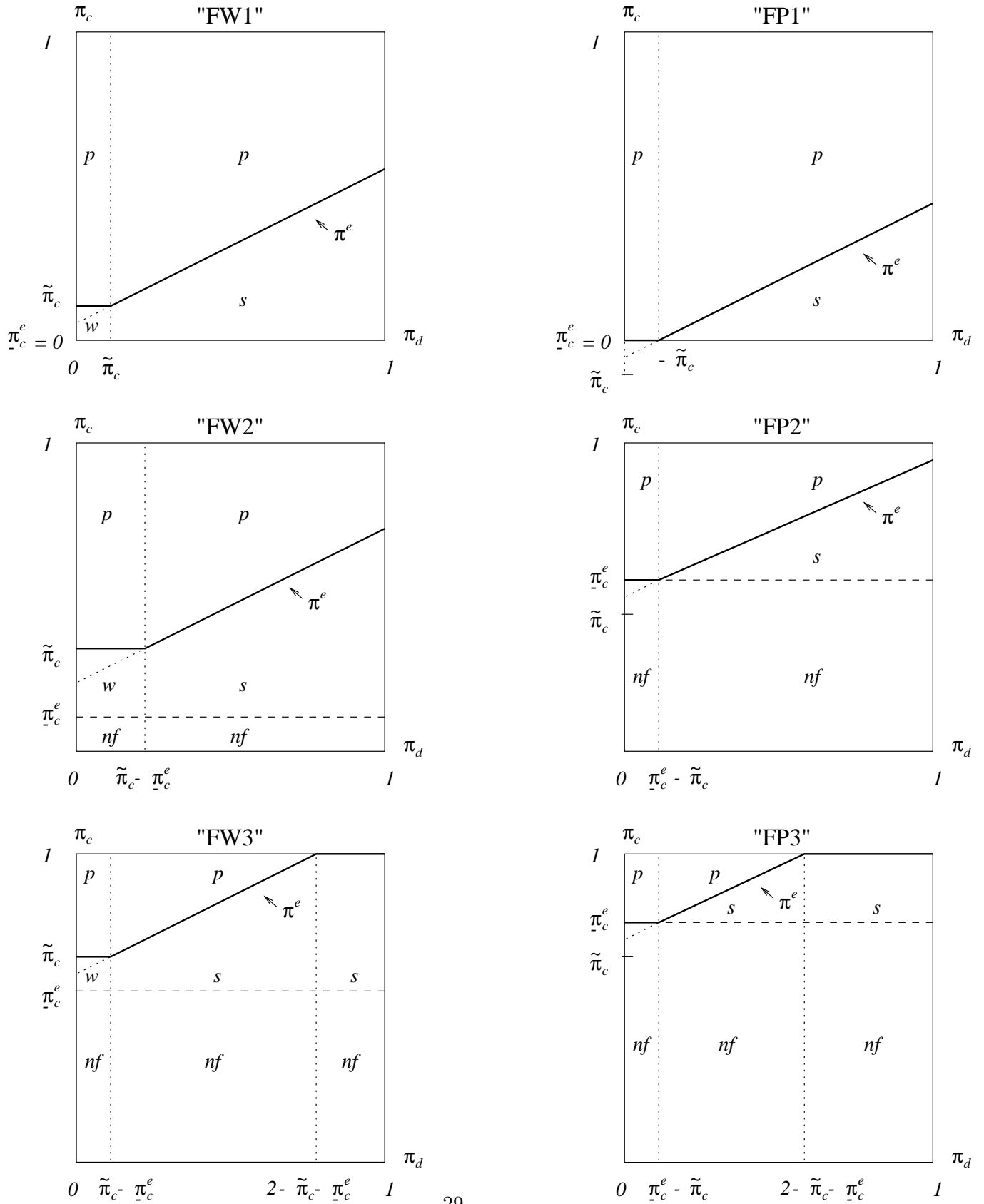


Figure 4: Parameter Space and Corresponding Equilibrium

