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

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Abstract

This paper attempts to study the usage of the GATT/WTO dispute settlement mechanism and to explain its patterns across different regimes and decades, using a unified theoretical model. This study first explores 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 model is able to explain the surge in blocking incidence during the 1980s over the preceding GATT years and the immense frequency at which the new appellate procedure under the WTO is invoked. Furthermore, a two-sided asymmetric information framework is used to study the effects of political power on countries' incentives to use, and interactions in using, the GATT/WTO dispute settlement mechanism. It is shown that the magnitude of the political cost relative to the potential benefit that the complainant stands to gain when 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 us 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.

Keywords: GATT/WTO; dispute settlement

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

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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 relative effectiveness of the GATT/WTO legal system has very much hinged upon its dispute settlement mechanism. This procedure allows member countries to challenge other member countries' questionable trade measures in respect to the GATT/WTO agreements. Thus it has worked as a mutual surveillance and enforcement system of the GATT/WTO. Perhaps not surprisingly, this mechanism was not perfect to begin with. It started with meager treaty clauses and has elaborated considerably during GATT's nearly five-decade history. However, it was not until the establishment of the WTO in 1995 that the current procedure was adopted and fundamentally changed the mechanism of dispute settlement under the GATT/WTO.

One general problem that had overshadowed the dispute procedure under the GATT regime was the customary practice to require all decisions to be made by consensus. 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 "panel" report. The practice was established under the GATT that a "panel" of experts would be established to hear and rule on a dispute if a bilateral settlement could not be reached between the disputing parties. However, because only the "Contracting Parties" (the member countries) 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. In the face of an adverse panel ruling, the defending party could potentially block the report and avoid implementation of panel's recommendations. Intriguing as it might seem, losing parties, in spite of their veto power, did not block panel reports as often as one might think. During the 1950s–1970s, only one out of 41 panel rulings were blocked.[1] However, the blocking problem became more conspicuous during the 1980s when ten out of 47 panel reports were blocked. Presumably because of international diplomatic pressure or considerations of future disputes, countries did not opt to veto a panel report unless it was really necessary.

In 1995, the WTO was established and the new dispute procedure under the WTO altered several features of the previous GATT mechanism. The most significant was the removal of the

[1] For more details on the data, see Table 1.

consensus rule for panel adoption and hence the elimination of the blocking problem. A panel report will be deemed automatically adopted. To guard against possible legal errors that may occur at the panel stage, however, a new appellate procedure was created instead. The panel report 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. Thus, the presumption is reversed, and blocking a panel report has become virtually impossible. In the six years' operation of the new WTO during 1995–2000, this new appellate procedure has been invoked at an immense frequency: 78% of panel rulings were appealed.[2]

Another, less explicit, issue about the GATT/WTO dispute settlement mechanism is the potential of economic and political power to influence countries' decisions as they consider confronting another country over its questionable measures. A small country might worry that the support from or benefit of maintaining an amicable relationship with a powerful country would be abated if it chooses to litigate and bring the dispute into the public eye. During the dispute settlement process, this political consideration might also affect countries' ability to extract a bilateral settlement, and influence countries' decisions to continue litigation or give up. Depending on the effectiveness and the international acceptance of using the GATT/WTO procedure to resolve trade conflicts, power politics might have intervened in this international legal system to a greater or lesser degree. 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. One possible indication of the degree of power politics at play is the proportion of withdrawn cases. 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 to the 1980s when we witnessed a surge in both the litigation activities (115 complaints) and withdrawn incidents (40 cases).[3] The pattern shown in the data corresponded to some interesting evolutions and movements in these decades, as will be documented below, which might have affected countries'

[2]Ibid.

[3]For more details on the data, see Table 2.

interests and political costs in using this system.

In this paper, the goal is to develop a unified theoretical model to explain the stylized facts observed across different decades of the GATT/WTO regimes. How can we explain the surge in the blocking incidence during the 1980s, and what were the costs and benefits disputants might face when they decided to block an adverse panel ruling? Why has the new appellate procedure under the WTO been invoked at such a high frequency, and has the new appellate procedure altered the disputants' incentive structure to challenge a panel ruling? Furthermore, is there a systematic way in which we can explain the pattern of filing activity and withdrawal incidence across different decades of the GATT regime? Theoretically, can we map the characteristics of these decades into an underlying variable that in turn will determine the pattern of filing activity and the frequency of various procedural outcomes?

Considerable amount of studies on the GATT and WTO dispute settlement mechanisms have developed in the area of law[4] and political science.[5] Nevertheless, a short list of economics literature exists that attempts to explain the operation of this international litigation procedure.[6] Bütler and Hauser (2000) was the first theoretical paper that systematically investigated this mechanism from an economic perspective. However, Bütler and Hauser (2000) focused mainly on the new WTO dispute settlement procedure. Therefore, the incentives and interactions of countries in using the dispute procedure under the GATT regime were largely left unaccounted for. Secondly, Bütler and Hauser (2000)'s theoretical model maintained a complete information framework and, accordingly, only cases with positive expected payoff from panel proceedings would be filed. With this setup, we can not explain the withdrawn or abandoned cases that exist in the data.

In a related literature, tremendous advancement has been made in the economic analysis of "civil" legal disputes. A comprehensive review of this literature was provided by Cooter and Rubinfeld (1989). Most of the works in this literature, however, have employed the assumption that the expected return from a trial to the plaintiff is positive. This assumption effectively excludes the possibility that a plaintiff might drop the action after bringing a suit and quite drastically reduces

[4]See, for example, Hudec (1993, 1999), Jackson (1997, 2000), and Park and Umbricht (2001).

[5]See, for example, Busch (2000) for an empirical investigation of countries' decisions to settle or to continue litigation under the GATT procedure.

[6]In an empirical paper, Horn, Mavroidis and Nordström (1999) investigated whether the WTO Dispute Settlement system is biased against smaller and poorer countries. They concluded that the diversity and value of exports as well as legal capacities could explain the dispute pattern fairly well.

the strategic possibilities for the plaintiff. This includes a series of papers on settlement decisions by Bebchuk (1984) and Reinganum and Wilde (1986) with one-sided asymmetric information, and Schweizer (1989) and Daughety and Reinganum (1994) with two-sided asymmetric information. P'ng (1983), Nalebuff (1987), and Bebchuk (1988) are a few exceptions. Using Bebchuk (1988)'s terminology, they allow the possibilities of a negative-expected-value (NEV) suit and the outcome that a suit might be withdrawn or dropped if a settlement fails. These three papers have in common the fact that there exists one-sided asymmetric information, but are different in the side which owns private information and/or which proposes the settlement offer.

These three models are not so satisfactory in terms of explaining withdrawn suits, however, because upon closer inspection, the "withdrawal" outcome in these models either does not exist in the equilibrium (Nalebuff 1987), or exists in the equilibrium only because no cost is incurred by the plaintiff by filing and then withdrawing a suit (P'ng 1983 and Bebchuk 1988). In reality, it is more likely than not that the plaintiff has to incur some cost by starting a suit.

In Nalebuff (1987), the defendant owns private information which bears on the expected outcome of a trial. Initially, the plaintiff views his suit as having positive expected value but might be required to revise downward his estimate of the expected value of going to trial if his proposed settlement demand is rejected. Nalebuff (1987) shows that, in equilibrium, the plaintiff always asks for a sufficiently large settlement so that if his offer is rejected, he will proceed to court with probability one. This implies that in equilibrium, we will not see a withdrawal outcome!

In P'ng (1983), a plaintiff with a NEV suit might be able to extort a settlement from the defendant in a Nash equilibrium. However, as indicated by Bebchuk (1988), this is not a subgame perfect equilibrium. The defendant has perfect information and he knows when the plaintiff has a NEV suit. It is not a credible threat for the plaintiff to go to trial if the defendant refuses to settle. Therefore, the defendant will not settle with the plaintiff with a NEV suit, and such plaintiff will simply have to drop the case after filing it. However, this "withdrawal" equilibrium outcome will vanish if we attach some litigation cost to such a strategy by the plaintiff. Since a plaintiff with a NEV suit knows he will not be able to extort any settlement by bringing the suit against the defendant, therefore, to avoid the litigation cost, he will simply choose not to file the action at all in the first place.

In Bebchuk (1988), the plaintiff has the private information regarding expected judgement, so

that in some scenario, a plaintiff with a NEV suit is able to extract a settlement offer by exploiting the fact that the defendant is uncertain about the actual merit of the plaintiff's case. In the case that a settlement fails, the plaintiff with a NEV suit can always opt to drop the suit. Again, however, this "withdrawal" equilibrium outcome will not exist if the plaintiff has to incur some cost of filing and then withdrawing a suit. Since the plaintiff has complete information, he knows, based on the information, whether the defendant will offer to settle or not. In the face of some litigation cost to start a suit, a plaintiff with a NEV suit will choose not to file the case in the first place if no settlement is foreseeable.

To explore the effects of power politics, this study allows for potential litigation costs that the complainant has to incur by bringing a dispute under the GATT/WTO procedure. The potential litigation costs include possible international political costs that result from an aggravated international relationship with the defending country. For example, 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, net of domestic political support, represent the various political powers that might influence a country's decision to use the dispute system.

The one-sided asymmetric information models of P'ng (1983) and Bebchuk (1988) as discussed above can not explain the "withdrawn" cases if there is positive litigation cost associated with this outcome. Nevertheless, the "withdrawn or abandoned" cases account for a non-negligible share of complaints filed under the GATT regime. Overall, these constitute 27% of 207 complaints in the GATT's history during 1948–1989.[7] In this paper, a two-sided asymmetric information framework with potential litigation cost is used to explain these withdrawn cases. The intuition for the withdrawal outcome is that because the litigation (political) cost accrues over time to a complaining country once he files a dispute against another member country under the GATT, a complaining country who is not sufficiently optimistic about panel judgement will not pursue a case

[7] See Table 2.

through the panel procedure. In other words, he will withdraw the complaint if the defendant does not agree to settle. However, the complaining country perceives some probability that the defending country might settle because of the asymmetric information. If the prospect of a settlement and the magnitude of the settlement are large enough, this might justify his decision to file the complaint in the first place. The model's results indicate that as the political cost increases relative to the potential benefit of using this mechanism in resolving trade conflicts, the dispute procedure is initiated less frequently, whereas the incidence of cases being withdrawn/abandoned increases at first but then decreases until it becomes nil.

This study also explores the role of the degree of legal controversy over a panel ruling in determining countries' incentives to block/appeal a panel report. It is shown that under both the GATT and WTO regimes, there exists asymmetric advantage between the complainant and defendant. The complainant's potential benefit of blocking/appealing an adverse panel ruling is uniformly less than the defendant's, but it bears the same structure of cost as the latter. This disadvantage to the complainant is diminished under the WTO procedure compared to the GATT, but it is not totally eliminated. It is also shown that as the level of legal controversy over panel rulings increases overall, the frequency of panel reports being blocked under the GATT will increase. However, the propensity to appeal a report under the new WTO procedure is generally higher than the propensity to block a panel report under the GATT when such appellate reviews were not available.

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 during its forty-eight-year history. Section 3 introduces a theoretical structure of the dispute mechanism, including the payoff and uncertainty countries might face during the process. 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 The 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.[8] 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 its benefit expected under the GATT being nullified or impaired by the other member country's trade measure. If no settlement is reached between the parties, the matter may be referred to the Contracting Parties, 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 stage 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."[9] 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/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.[10]

[8] For more details, see Jackson (2000, p. 119).
[9] Hudec (1993), p. 30.
[10] See Hudec (1993), Complaint 69, 70, 71, 72.

During the Tokyo Round negotiations conducted in 1973–1979, the dispute settlement mechanism under the GATT 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 produced "Understanding"[11] 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 the negotiations' 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 complainant an automatic right to panel procedures. In this respect, the dispute procedures under these Codes were stronger compared to the GATT's general procedure. The consensus rule, nevertheless, was still upheld for panel adoption in these various Code procedures.[12]

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 the old GATT machinery. No longer are the separate procedures under the Tokyo Round Codes valid. The DSU will govern all parts of the GATT/WTO system and serve as the single, unified mechanism for dispute settlement. Furthermore, the blocking problem that has concerned the GATT regime is completely eliminated. A complaining country will be granted an automatic right to have a panel created. Thus blocking is prevented at this early stage. Most importantly, a panel report will now be deemed automatically adopted by the new Dispute Settlement Body (DSB). However, an appellate procedure is added as a safeguard against possible legal errors that may occur at the panel stage. Either one of the disputing parties may consider appealing 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.[13]

[11] "Understanding Regarding Notification, Consultation, Dispute Settlement and Surveillance."
[12] Hudec (1993), pp. 53–57.
[13] Jackson (2000), pp. 177–178.

3 The Setup

3.1 The Game tree

The GATT and WTO dispute settlement procedures can be represented by game trees as 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 to file the complaint, it starts the litigation process, as indicated by the beginning of Stage 0. In practice, C invokes the GATT/WTO process by requesting consultation with the defending country D. The ensuing negotiations between the parties might take various forms. Here the negotiating process is modelled 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. If the dispute is neither settled or withdrawn, it proceeds to the panel stage (Stage 1).

During the panel stage, a panel is established at C's request to hear and rule on the matter.[14] Under the GATT procedure, a panel ruling is not binding unless it is adopted by the Contracting Parties with consensus vote. If C's claim is ruled negatively, C can choose whether to block the report or not. In either case, no changes in D's trade practices or policies are required. If C's claim is ruled positively, D can potentially block the adoption of the panel report. If D chooses not to, the panel ruling becomes binding, and D is obligated to remove the confirmed trade barrier at the beginning of Stage 2.[15]

Under the WTO procedure, a panel ruling is deemed automatically adopted unless it is appealed by either parties. In the case of a "no violation" ruling and if C does not appeal, the dispute ends

[14] I 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.

[15] To simplify the analysis, I abstract from the potential problem of non-implementation and assume that D will comply with panel's recommendations once the panel report is adopted. This assumption may not be as unrealistic as it seems. In Hudec (1993, p. 278), it is documented that under the GATT, 90% of cases with violation rulings were implemented in compliance with panel's recommendations. If we take into account that some violation rulings were blocked, the compliance rate with "adopted" panel reports should actually be higher.

and no changes in D's trade practices are required. On the other hand, if a "violation" ruling is not appealed, D is obligated to comply with the panel's recommendations. The case proceeds to the appellate stage (Stage 2) if either party appeals. During the appellate procedure, the Appellate Body reviews the legal aspects of the panel reports and make final rulings on the case, which may reverse the original panel rulings in favor of the other party. The appellate review will likewise be automatically adopted, and is enforceable if a "violation" ruling against D is made. The implementation is assumed to take place at the beginning of Stage 3.

3.2 The Payoff and Information Structure

If C decides not to file the case (nf), nothing happens and the status quo welfare applies for both countries, which is normalized to be zeros. If C decides to file the case (f), however, it might incur some (pecuniary or nonpecuniary) cost because of the aggravated international relationship with country D. The cost can be, for example, a loss of existing financial aid or preferential treatment provided by country D, 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 or domestic political benefits may vary with country pairs, industries involved, and international attitudes toward the GATT/WTO dispute settlement procedure. Let K^f represents the political cost incurred by C in every period, net of domestic political support, 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.[16]

If faced with a complaint, D decides whether or not to settle with C. In reality, settlements in trade negotiations specify changes in policies or practices used by D. Here, 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

[16]In other words, it is assumed that the damage or the benefit is permanent once the case is filed, but is reversible before the dispute is escalated to the panel stage.

represents a transfer of welfare from D to C as promised by the changes in D's policies.[17] Any zero or negative settlement offer by D is equivalent to D's refusal to settle.

When a case is brought before the panel, both parties are uncertain about possible panel rulings. It is assumed that countries hold different interpretations about GATT/WTO law and they therefore have subjective predictions about possible panel rulings. This is represented by π_c and π_d, the respective probability that C and D predict that C's claim will be ruled positively. Private information also exists on both sides that enters into their predictions about panel rulings. Therefore, disputing parties are not sure how optimistic the other party is about panel judgement. It is assumed that each party believes the other party's prediction to be uniformly distributed among $[0, 1]$.

Before the panel rulings are made, the parties are also uncertain about the quality of panel rulings that will be made. Let $L \in [0, 1]$ represent the degree of legal controversy that will arise over a panel ruling. It is assumed that both parties consider the degree of legal controversy that will arise over a certain panel ruling to be distributed with the probability density function (p.d.f.) $f(L|R)$, where $R = \{0, 1\}$ corresponds to a "no violation/violation" ruling. That is, $f(L|0)$ is the p.d.f. of the degree of legal controversy that will arise over a "no violation" ruling, while $f(L|1)$ is the p.d.f. of the degree of legal controversy that will arise over a "violation" ruling.

After the panel reports are issued, the rulings and the quality of the rulings are revealed. Under the GATT, without an appellate procedure, either party might consider blocking an adverse panel ruling given the quality of the report. However, it is diplomatically costly to block a report, unless the report is indeed subject to a large degree of controversy. To model this consideration, the blocking cost function $K^b(L)$ is introduced, which is the cost to block a report and whose magnitude depends on the degree of legal controversy over it.

Under the WTO, the appellate procedure was introduced as a safeguard measure against possible legal errors contained in panel rulings. It is assumed that the reversal probability of a panel ruling by the Appellate Body is equal to the degree of legal controversy over it. In other words, the higher is the legal controversy over a panel ruling, the more likely is the decision to be reversed by the Appellate Body. For simplification, the cost to appeal a report is assumed to be negligible.

[17] It is recognized that most trade measure changes exhibit non-zero sum natures. Here, and later in D's implementation of panel recommendations, zero sum is assumed to simplify the analysis.

After 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 compensation (under the WTO). As a last resort, C can be authorized to retaliate by withdrawing tariff concession in the same sector or in other sectors with equivalent value to C's welfare loss due to D's trade barrier. 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. 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.

4 The Theoretical Model

4.1 The Incentives to Block/Appeal Panel Reports

GATT:

At the point after the panel report is issued, the result (violation or no violation) and the quality of the ruling (the degree of legal controversy) are revealed. Under the GATT, an appellate procedure is not available, but disputing parties have the ability to block the adoption of an adverse panel ruling. However, it is diplomatically costly to block a report, unless the report is indeed subject to a large degree of legal controversy. To model this concept, the cost to block a report $K^b(L)$ is assumed to be a decreasing step function of L, as illustrated in Figure 2. If the degree of legal controversy over a panel ruling is large enough ($L > \bar{L}$), there is no cost to block the report. Otherwise, it is costly.

More specifically, when D faces a "violation" ruling, the benefit to blocking this ruling is to avoid the need to change the trade measure, which has value to D of V per period, or a continuation value of $\frac{V}{1-\delta}$. Weighing against the cost to blocking the report, $K^b(L)$, D will block the report if and only if

$$K^b(L) < \frac{V}{1-\delta}.$$

Therefore, for all $L > \bar{L}$, D blocks the report.[18] Prior to the panel, the degree of legal controversy that will arise over a "violation" ruling is considered to be distributed with the p.d.f. $f(L|1)$. Therefore, both disputing parties predict that a violation ruling will be blocked by D with a

[18]It is assumed that if the degree of legal controversy is not large enough ($L \leq \bar{L}$), the cost is always larger than the benefit to blocking a report.

probability $1 - F(\bar{L}|1)$, where $F(L|1)$ is the corresponding cumulative distribution function of $f(L|1)$. This blocking probability is indicated by the solid shaded area under $f(L|1)$ for the GATT regime in Figure 2 .

On the other hand, when C faces a "no violation" ruling, the benefit to blocking this ruling is 0, since no changes in D's trade measure will follow. Weighing against the cost to blocking the report, $K^b(L)$, C will block the report if and only if

$$K^b(L) < 0.$$

Since the blocking cost is non-negative, C will always choose not to block the report regardless of L. Therefore, prior to the panel, both disputing parties expect a "no violation" ruling to be blocked by C with probability 0.

WTO:

Under the WTO, the veto power of parties to block the adoption of a report is taken away. In stead, the appellate procedure was introduced to guard against possible legal errors contained in panel rulings. As assumed earlier, the reversal probability of a panel ruling by the Appellate Body is equal to the degree of legal controversy over it, the benefit to D of appealing 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 more controversial a panel ruling is, the more beneficial it is for D to appeal. This benefit function is indicated in Figure 2. Since the cost to appeal is assumed to be negligible, D will always appeal a "violation" ruling regardless of L. Therefore, prior to the panel, both disputing parties expect a violation ruling to be appealed by D with probability 1. This probability is indicated by the solid shaded area under $f(L|1)$ for the WTO regime in Figure 2.

On the other hand, when C faces a "no violation" ruling, the benefit to 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. Again, it is always beneficial for C to appeal a "no violation" ruling regardless of L, as the cost is negligible. Therefore, prior to the panel, both parties also expect a "no violation" ruling to be appealed by C with probability 1, as indicated by the solid shaded area under $f(L|0)$ for the WTO regime in Figure 2.

Implications:

Four implications follow immediately from the model above. First, under both GATT and WTO regimes, there exists asymmetric advantage between C and D. C's potential benefit of blocking/appealing an adverse panel ruling is uniformly less than D's, but it bears the same structure of cost as D. Second, this disadvantage to C is diminished under the WTO procedure compared to the GATT. However, it is not totally eliminated, mainly because under the GATT/WTO system, given a violation ruling, D is not required to make compensation to C for the loss that was incurred before and during the litigation process. Third, if the level of legal controversy increases overall so that the pdf $f(L|R)$ shifts to the right, the frequency of panel reports being blocked under the GATT will increase. This increase is illustrated by the dotted shaded area in Figure 2. Fourth, the frequency of appeal under the WTO overall should be much higher than the frequency of panel reports being blocked under the GATT.

In Table 1, we see that under the GATT regime, there is a surge in the frequency of panel reports being blocked in the 1980s compared to preceding years. As discussed earlier, 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. Moreover, many of these new Codes contained their own dispute settlement procedures. These various stronger Code procedures along with the more restrained procedure of Article XXIII created a complex and fragmented system of dispute settlement under the GATT. These increases in the demand for legal capacities, following the Tokyo Round, however, were not coupled with equivalent increases in the supply of legal resources provided by the GATT institution. Therefore, we would expect the panel reports to be subject to higher degrees of legal controversy overall in the 1980s following the Tokyo Round. This confirms the hypothesis that if the level of legal controversy increases overall so that the pdf $f(L|R)$ shifts

to the right, the frequency of panel reports being blocked under the GATT will increase.

In addition, Table 1 also verifies the model's prediction that the frequency of appeal under the WTO should be much higher than the frequency of panel reports being blocked under the GATT. With the new appellate procedure under the WTO, about 78% of panel rulings were appealed, which is much higher than the frequency (12.5%) of panel reports being blocked under the GATT overall.[19] Finally, Table 1 also indicates that under the GATT regime, the defendant blocked the report at a higher frequency than the complainant given an adverse ruling. This verifies the above analysis that asymmetric advantages existed under the GATT dispute settlement system that put the complainant in a less favorable position.

4.2 The Interactions at the Consultation Stage

As illustrated in Figure 1, if C files the complaint, the dispute will end up in one of the three following 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 of V in every period from the beginning of stage 2. C also predicts a possibility $1-\pi_c$ 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

$$\begin{aligned} E\Delta W_c^p &= \pi_c F(\bar{L}|1)\frac{\delta^2}{1-\delta}V - \frac{1}{1-\delta}K^f \\ &\equiv \pi_c \beta \frac{\delta^2}{1-\delta}V - \frac{1}{1-\delta}K^f, \end{aligned}$$

where $\beta \equiv F(\bar{L}|1)$. From D's perspective, however, 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

[19] The simplifying assumption of the model that the cost to appeal is negligible has led to the strong prediction that all panel reports under the WTO will be appealed. By allowing for some appellate cost (lawyers, etc.) in the model, panel reports will not be appealed at all times.

change from the panel procedure is

$$\begin{aligned} E\Delta W_d^p &= -\pi_d F(\bar{L}|1)\frac{\delta^2}{1-\delta}V \\ &= -\pi_d \beta \frac{\delta^2}{1-\delta}V. \end{aligned}$$

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

$$\Delta W_d^s = -S.$$

C's decision to continue or withdraw the litigation:

As illustrated in Figure 1, if D does not offer to settle, C has to decide whether to continue or withdraw the complaint. C is indifferent between continuing and withdrawing the complaint when its expected payoff from a panel is equal to withdrawal. That is, $E\Delta W_c^p = \Delta W_c^w$:

$$\begin{aligned} \pi_c \beta \frac{\delta^2}{1-\delta}V - \frac{1}{1-\delta}K^f &= -K^f, \\ \Rightarrow \pi_c &= \frac{K^f}{\delta \beta V} \equiv \tilde{\pi}_c. \end{aligned} \tag{1}$$

For all $\pi_c \geq \tilde{\pi}_c$, C expects a higher payoff from panel proceedings than from giving up, so C will

choose to continue litigation. On the other hand, for all $\pi_c < \tilde{\pi}_c$, C will withdraw the case.

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

On the other hand, if D offers to settle at the terms S, there exists a corresponding type of C with expectation $\pi_c(S)$ such that he is indifferent between accepting and rejecting the offer. The level of expectation corresponding to a settlement offer S such that $E\Delta W_c^p = \Delta W_c^s$ is:

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

For all $\pi_c > \pi_c(S)$, C is more optimistic about the panel ruling than the borderline type $\pi_c(S)$ so that he prefers to continue the litigation and not to settle. On the other hand, for all $\pi_c < \pi_c(S)$, C is less optimistic than $\pi_c(S)$ and will opt to accept the offer S.

D's settlement decision:

Because there is two-sided asymmetric information, D is not certain how optimistic C is about the panel judgement and whether C will proceed to the panel stage if he refuses to settle. On the other hand, C is not sure how pessimistic D is about the panel judgement and whether D is willing to settle if he files the complaint.

Suppose the lowest type of C (C with the least optimistic prediction about panel rulings) that will file a complaint is $\underline{\pi}_c$, and suppose that D's belief about this is $\underline{\pi}_c^b$. Then, given an settlement offer S, D expects that $\pi_c \in [\underline{\pi}_c^b, \pi_c(S)]$ will accept the offer, while $\pi_c \in [\pi_c(S), 1]$ will reject the offer and proceed to the panel stage. Because D believes π_c to be uniformly distributed among $[0, 1]$, D views the probability that $\pi_c \in [\underline{\pi}_c^b, \pi_c(S)]$ as $\pi_c(S) - \underline{\pi}_c^b$. Therefore, D's interim expected payoff from proposing an offer S is:

$$E\Delta W_d^s(S) = -[\pi_c(S) - \underline{\pi}_c^b]S - [1 - \pi_c(S)]\bar{S}_d,$$

where $\bar{S}_d = -E\Delta W_d^p$ is the expected welfare loss from the panel proceedings.

In some equilibrium, it may be optimal for C to file the complaint even if he is less optimistic than the borderline type $\tilde{\pi}_c$. In other words, he will withdraw the complaint if D does not offer to settle. However, there is some probability that D might settle because of the asymmetric information.

If the prospect of a settlement and the magnitude of the settlement are large enough, this might justify C's decision to file the complaint. In terms of the notation of the model, this corresponds to $\underline{\pi}_c < \tilde{\pi}_c$.

Suppose D believes that $\underline{\pi}_c^b < \tilde{\pi}_c$. Then for all offers S such that $\pi_c(S) < \tilde{\pi}_c$, it corresponds to $S < 0$ (see equation (2)). This is equivalent to no settlement, and all $\pi_c \in [\tilde{\pi}_c, 1]$ will request a panel procedure by definition of $\tilde{\pi}_c$ and all $\pi_c \in [\underline{\pi}_c^b, \tilde{\pi}_c]$ will withdraw the complaint. Therefore, D's expected payoff is $-(1-\tilde{\pi}_c)\bar{S}_d$. Moreover, when $\pi_c(S) = \tilde{\pi}_c$, it corresponds to $S = 0$, and $E\Delta W_d^s$ reduces to $-(1-\tilde{\pi}_c)\bar{S}_d$.

On the other hand, suppose that $\underline{\pi}_c^b > \tilde{\pi}_c$. Then for all offers S such that $\pi_c(S) < \underline{\pi}_c^b$, D's offer is not large enough to settle even with the lowest type of C who files. Since $\underline{\pi}_c^b > \tilde{\pi}_c$, all $\pi_c \in [\underline{\pi}_c^b, 1]$ will proceed to the panel stage. In this case, D's expected payoff is $-(1-\underline{\pi}_c^b)\bar{S}_d$. Furthermore, when $\pi_c(S) = \underline{\pi}_c^b$, $E\Delta W_d^s$ reduces to $-(1-\underline{\pi}_c^b)\bar{S}_d$.

Therefore, D's expected payoff from settling or not settling is:

$$E\Delta W_d^f = \begin{cases} -[1-\max\{\underline{\pi}_c^b, \tilde{\pi}_c\}]\bar{S}_d & \forall\ S \text{ s.t. } \pi_c(S) \le \max\{\underline{\pi}_c^b, \tilde{\pi}_c\}, \text{or equivalently 'not settle'}, \\ -[\pi_c(S) - \underline{\pi}_c^b]S - [1-\pi_c(S)]\bar{S}_d & \forall\ S \text{ s.t. } \pi_c(S) \ge \max\{\underline{\pi}_c^b, \tilde{\pi}_c\}. \end{cases}$$

This objective function $E\Delta W_d^f$ is illustrated in Figure 3. Suppose S^e is the maximizer of $E\Delta W_d^s(S)$. Since $E\Delta W_d^s(S)$ is a concave function and $E\Delta W_d^f$ is continuous at $\max\{\underline{\pi}_c^b, \tilde{\pi}_c\}$, it follows that $E\Delta W_d^s(S^e) \ge -[1-\max\{\underline{\pi}_c^b, \tilde{\pi}_c\}]\bar{S}_d$, if $\pi_c(S^e) \ge \max\{\underline{\pi}_c^b, \tilde{\pi}_c\}$. In this case, it is optimal for D to offer to settle at S^e. This scenario is indicated by the "Settle" column in Figure 3. On the other hand, if $\pi_c(S^e) < \max\{\underline{\pi}_c^b, \tilde{\pi}_c\}$, it is optimal for D not to settle. This scenario is indicated by the column of "Do not Settle" in Figure 3.

Let us now characterize the optimal offer, S^e. S^e should satisfy the following first order condition:

$$\frac{\partial E\Delta W_d^s}{\partial S} = -[\frac{\partial \pi_c(S)}{\partial S}(S - \bar{S}_d) + \pi_c(S) - \underline{\pi}_c^b] = 0$$

Use the definition of $\pi_c(S)$ in equation (2) and the definition of $\bar{S}_d$. It is straightforward to show that

$$S^e = \frac{1}{2}\frac{\delta^2\beta V}{1-\delta}(\pi_d - \tilde{\pi}_c + \underline{\pi}_c^b) \tag{3}$$

and

$$\pi^e \equiv \pi_c(S^e) = \frac{1}{2}(\pi_d + \tilde{\pi}_c + \underline{\pi}_c^b). \tag{4}$$

Therefore, if $\pi^e > \max\{\underline{\pi}_c^b, \tilde{\pi}_c\}$, the optimal strategy for D is to propose the settlement offer S^e, which C will accept for $\pi_c \in [\underline{\pi}_c^b, \pi^e]$ and reject for $\pi_c \in [\pi^e, 1]$. Otherwise, it is optimal for D not to settle.

C's filing decision and equilibrium outcomes:

Before C files the complaint, C is not sure how pessimistic D is about panel judgement and whether D will offer to settle if he files the complaint. As indicated by equations (3) and (4), when D is more pessimistic (higher π_d) about panel judgement, D is willing to propose a larger settlement S^e. On the other hand, when D becomes more optimistic (lower π_d), the settlement offer will shrink, up to a point where D will opt not to settle ($\pi^e \leq \max\{\underline{\pi}_c^b, \tilde{\pi}_c\}$). Given D's settlement strategy, therefore, C will decide to file the complaint if the expected payoff from various possible outcomes combined is non-negative.

Suppose in equilibrium, the lowest type of C (C with the least optimistic prediction about panel rulings) that will file a complaint is $\underline{\pi}_c^e$. In equilibrium, D's belief should be consistent with C's strategy, so in characterizing the equilibrium, $\underline{\pi}_c^b$ will be replaced with $\underline{\pi}_c^e$.

As we will see, the type of equilibrium that will emerge depends crucially on the value $\tilde{\pi}_c$. $\tilde{\pi}_c$ as defined in equation (1) is the ratio of the political cost incurred by C to bring a dispute against D relative to the value of the disputed trade measure discounted by blocking probability and time lag in implementation. Therefore, we can regard $\tilde{\pi}_c$ as the cost to file the complaint relative to possible benefits. As the cost increases, it is less favorable for C to continue litigation, unless C is strongly optimistic about the panel judgement. Therefore, there is less possibility that C will proceed to the panel. In light of this, D will be less likely to propose to settle or will offer to settle at less favorable terms. In the end, the lowest type of C that will file a complaint, $\underline{\pi}_c^e$, has to be higher.

An overview of the various sorts of equilibria that will emerge is provided in Figure 4. In each panel of this figure, various equilibrium outcomes are indicated for all possible combinations of π_d, the defendant's perceived probability of losing a case, and π_c, the complainant's perceived probability of winning. The possible outcomes are: "*nf*", that the complainant does not file the

case; "w" that they file and withdraw; "s" that they file and accept a settlement offered by the defendant; and "p" that the case proceeds to a GATT/WTO panel. Outcomes depend not only on π_d and π_c, but also on other parameters such as $\tilde{\pi}_c$, which represents the political cost of filing a case, and δ, the discount factor. When $\tilde{\pi}_c$ is smaller than δ, six possible types of equilibria arise, each of them corresponding to a different level of $\tilde{\pi}_c$. Three of these include the possibility of withdrawal of the dispute, and are labelled "FW1–3". The others do not, and are labelled "FP1–3". In all of the cases, the sizes of the regions for each outcome give some sense of how likely the outcomes may be, especially when the two perceived probabilities are uniformly distributed on the interval $[0, 1]$.

In what follows, detailed proofs are given that fully characterize each of these equilibria. The results include the conditions on the political cost $\tilde{\pi}_c$ under which a particular type of equilibrium will emerge, the complainant's filing decision, $\underline{\pi}_c^e$, the defendant's settlement decision, the incidence of "withdrawal" outcome, and its property as $\tilde{\pi}_c$ varies.

Equilibrium "FP1": $\tilde{\pi}_c \leq 0$ ($\Rightarrow K^f \leq 0$)

When $\tilde{\pi}_c \leq 0$, it implies that $K^f \leq 0$ (see equation (1)). Recall the definition of K^f from Section 3.2, K^f is the international political cost incurred by C in every period, net of domestic political support, by filing a complaint against D under the GATT/WTO. When $K^f \leq 0$, this is a situation where the political benefit from domestic support is larger than the international political cost. In this case, because $\tilde{\pi}_c \leq 0$, it follows that 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 outcomes by filing the complaint is non-negative. Therefore, C will always file the complaint. This is equivalent to $\underline{\pi}_c^e = 0$. Replacing $\underline{\pi}_c^b$ with $\underline{\pi}_c^e = 0$ in equations (3) and (4) at the equilibrium, D's settlement decisions are

$$S^e = \frac{1}{2}\frac{\delta^2 \beta V}{1-\delta}(\pi_d - \tilde{\pi}_c) \tag{5}$$

$$\pi^e = \frac{1}{2}(\pi_d + \tilde{\pi}_c). \tag{6}$$

For all $\pi_d \in [-\tilde{\pi}_c, 1]$, $\pi^e > \max\{\underline{\pi}_c^e, \tilde{\pi}_c\} = 0$. Therefore, D will offer to settle at S^e, which $\pi_c \in [0, \pi^e]$ will accept, and $\pi_c \in [\pi^e, 1]$ will reject and proceed to the panel stage. On the other hand, for all $\pi_d \in [0, -\tilde{\pi}_c]$, D will not settle and all $\pi_c \in [0, 1]$ will go on to the panel procedure. This equilibrium

is illustrated in Figure 4 under the title "FP1".

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

The following three scenarios look at the situation when $0 < \tilde{\pi}_c < \delta$. In other words, there is strictly positive political cost. However, the magnitude of the cost $\tilde{\pi}_c$ is small enough such that C with $\pi_c < \tilde{\pi}_c$ will file the complaint in the equilibrium. These types of C face a probability that D will not settle and in turn they will have to withdraw the case and incur some loss. However, there is also some probability that D will offer to settle and the settlement terms will be good enough so that the overall expected payoff by filing the complaint is non-negative and it justifies their decision to file the complaint.

Suppose initially that the lowest type of C who files is $\underline{\pi}_c < \tilde{\pi}_c$. For $\pi_c \in [\underline{\pi}_c, \tilde{\pi}_c]$, they have the same expected payoff from filing, because they will either withdraw or settle, with a payoff that does not depend on π_c. If the expected payoff from filing is positive for the lowest type $\underline{\pi}_c$, this will induce lower types of C to file and hence $\underline{\pi}_c$ will decrease. When $\underline{\pi}_c$ decreases, D's offer S^e decreases (see equation (3)). In turn, C's expected payoff from filing $E\Delta W_c^f$ decreases too. This will continue until $\underline{\pi}_c = 0$ despite that $E\Delta W_c^f$ is still positive at $\underline{\pi}_c = 0$, or until the expected payoff $E\Delta W_c^f$ equals zero for the lowest type of C who files. Let us characterize the first scenario now.

When $\underline{\pi}_c^e = 0$, D's settlement decisions again reduce to (5) and (6). For all $\pi_d \in [\tilde{\pi}_c, 1]$, $\pi^e > \max\{\underline{\pi}_c^e, \tilde{\pi}_c\} = \tilde{\pi}_c$. Therefore, D will offer to settle at S^e, which $\pi_c \in [0, \pi^e]$ will accept, and $\pi_c \in [\pi^e, 1]$ will reject and the dispute proceeds to a panel. On the other hand, for all $\pi_d \in [0, \tilde{\pi}_c]$, D will not settle. In this case, $\pi_c \in [0, \tilde{\pi}_c]$ will withdraw and $\pi_c \in [\tilde{\pi}_c, 1]$ will continue the litigation and request a panel. These outcomes are illustrated in Figure 4 under the title "FW1".

Let us derive the condition on $\tilde{\pi}_c$ under which such an equilibrium will arise. Because C believes π_d to be uniformly distributed among $[0, 1]$, C views the probability that $\pi_d \in [0, \tilde{\pi}_c]$ to be $\tilde{\pi}_c$, in which case D will not settle. Otherwise, D will settle at S^e. Therefore, for $\pi_c = \underline{\pi}_c^e = 0$, the

expected payoff from filing is

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

Using the formula for S^e from equation (5), it is straightforward to show that

$$E\Delta W_c^f(\underline{\pi}_c^e) = \frac{1}{4}\frac{\delta\beta V}{1-\delta}[-4(1-\delta)\tilde{\pi}_c + \delta(1-\tilde{\pi}_c)^2].$$

In the equilibrium, this has to be strictly positive. It can be shown that $E\Delta W_c^f(\underline{\pi}_c^e) > 0$ if and only if $\tilde{\pi}_c < \frac{2-\delta}{\delta} - \frac{2\sqrt{1-\delta}}{\delta}$, where the value on the right hand side is strictly positive. To sum up, this equilibrium is as follows:

$$\text{Equilibrium "FW1"} \begin{cases} 0 < \tilde{\pi}_c < \frac{2-\delta}{\delta} - \frac{2\sqrt{1-\delta}}{\delta} & \\ \underline{\pi}_c^e = 0 & \\ \pi^e = \frac{1}{2}(\pi_d + \tilde{\pi}_c) & \forall\ \pi_d \in [\tilde{\pi}_c, 1] \\ \text{'not settle'} & \forall\ \pi_d \in [0, \tilde{\pi}_c] \end{cases}$$

For $\pi_c \in [0, \tilde{\pi}_c]$, they face a probability $\tilde{\pi}_c$ that $\pi_d \in [0, \tilde{\pi}_c]$, in which case, D will not settle and they will have to withdraw the dispute. This withdrawal probability increases as $\tilde{\pi}_c$ increases.

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

In Equilibrium "FW1", we see that when $\tilde{\pi}_c$ is small enough, it is justified for all types of C to file ($\underline{\pi}_c^e = 0$) and the larger $\tilde{\pi}_c$ is, the larger the probability of observing a complaint being withdrawn. When $\tilde{\pi}_c$ continues increasing, however, D's settlement terms will become less favorable and the expected payoff for the initial lowest filing type will decrease, up to a point where the expected payoff from filing $E\Delta W_c^f$ will become zero. With an even larger $\tilde{\pi}_c$, $E\Delta W_c^f$ will become negative for the initial lowest filing type, so some of the lower type will exit the process until $E\Delta W_c^f$ becomes just equal to zero for the new lowest type. Let us characterize this equilibrium now.

Replacing $\underline{\pi}_c^b$ with $\underline{\pi}_c^e$ in equations (3) and (4) at the equilibrium, D's settlement decisions are

$$S^e = \frac{1}{2}\frac{\delta^2\beta V}{1-\delta}(\pi_d - \tilde{\pi}_c + \underline{\pi}_c^e) \tag{7}$$

$$\pi^e = \frac{1}{2}(\pi_d + \tilde{\pi}_c + \underline{\pi}_c^e). \tag{8}$$

The condition $\tilde{\pi}_c + \underline{\pi}_c^e < 1$ implies that $\tilde{\pi}_c$ is still not too large and that π^e will be less than 1 for all possible types of D. For all $\pi_d \in [\tilde{\pi}_c - \underline{\pi}_c^e, 1]$, $\pi^e > \max\{\underline{\pi}_c^e, \tilde{\pi}_c\} = \tilde{\pi}_c$. Therefore, D will offer to settle at S^e, which $\pi_c \in [\underline{\pi}_c^e, \pi^e]$ will accept, and $\pi_c \in [\pi^e, 1]$ will reject and proceed to the panel stage. On the other hand, for all $\pi_d \in [0, \tilde{\pi}_c - \underline{\pi}_c^e]$, D will not settle. In this case, $\pi_c \in [\underline{\pi}_c^e, \tilde{\pi}_c]$ will withdraw the complaint and $\pi_c \in [\tilde{\pi}_c, 1]$ will continue and proceed to the panel. These outcomes are illustrated in Figure 4 under the title "FW2".

To derive the condition on $\tilde{\pi}_c$ under which such an equilibrium will arise, note that for $\pi_c = \underline{\pi}_c^e$, the expected payoff from filing is

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

Using the formula for S^e from equation (7), it is straightforward to show that

$$E\Delta W_c^f(\underline{\pi}_c^e) = \frac{1}{4}\frac{\delta\beta V}{1-\delta}[-4(1-\delta)\tilde{\pi}_c + \delta(1 - \tilde{\pi}_c + \underline{\pi}_c^e)^2].$$

The condition that $E\Delta W_c^f(\underline{\pi}_c^e) = 0$ implies that $\underline{\pi}_c^e = \tilde{\pi}_c + 2\sqrt{\frac{1-\delta}{\delta}}\sqrt{\tilde{\pi}_c} - 1$. As the conditions on this equilibrium suggest, $\underline{\pi}_c^e$ has to be between zero and $\tilde{\pi}_c$ and such that $\tilde{\pi}_c + \underline{\pi}_c^e < 1$. These conditions translate correspondingly into the conditions on the scope of $\tilde{\pi}_c$. They are:

(a) $0 \leq \underline{\pi}_c^e \Rightarrow \tilde{\pi}_c \geq \frac{2-\delta}{\delta} - \frac{2\sqrt{1-\delta}}{\delta}$;

(b) $\underline{\pi}_c^e < \tilde{\pi}_c \Rightarrow \tilde{\pi}_c < \frac{\delta}{4(1-\delta)}$;

(c) $\underline{\pi}_c^e + \tilde{\pi}_c < 1 \Rightarrow \tilde{\pi}_c < \frac{1+\delta}{2\delta} - \frac{\sqrt{1+2\delta-3\delta^2}}{2\delta}$.

Therefore, this equilibrium can be summarized as follows:

$$\text{Equilibrium ``FW2''} \begin{cases} \frac{2-\delta}{\delta} - \frac{2\sqrt{1-\delta}}{\delta} \leq \tilde{\pi}_c < \min\{\frac{\delta}{4(1-\delta)}, \frac{1+\delta}{2\delta} - \frac{\sqrt{1+2\delta-3\delta^2}}{2\delta}\} & \\ \underline{\pi}_c^e = \tilde{\pi}_c + 2\sqrt{\frac{1-\delta}{\delta}}\sqrt{\tilde{\pi}_c} - 1 & \\ \pi^e = \frac{1}{2}(\pi_d + \tilde{\pi}_c + \underline{\pi}_c^e) & \forall\ \pi_d \in [\tilde{\pi}_c - \underline{\pi}_c^e, 1] \\ \text{`not settle'} & \forall\ \pi_d \in [0, \tilde{\pi}_c - \underline{\pi}_c^e] \end{cases}$$

For $\pi_c \in [\underline{\pi}_c^e, \tilde{\pi}_c]$, they face a probability $\tilde{\pi}_c - \underline{\pi}_c^e$ that $\pi_d \in [0, \tilde{\pi}_c - \underline{\pi}_c^e]$, in which case, D will not settle and they will have to withdraw the dispute. It can be shown that this withdrawal probability, $\tilde{\pi}_c - \underline{\pi}_c^e = 1 - 2\sqrt{\frac{1-\delta}{\delta}}\sqrt{\tilde{\pi}_c}$, decreases as $\tilde{\pi}_c$ increases. Therefore, from Equilibrium "FW1" to Equilibrium "FW2", as the political cost $\tilde{\pi}_c$ increases, the incidence of "withdrawal" outcome increases at first but then starts to decrease as $\tilde{\pi}_c$ increases further.

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

As $\tilde{\pi}_c$ keeps increasing such that $\tilde{\pi}_c + \underline{\pi}_c^e \geq 1$, however, D's settlement offer will hit the upper bound $\pi^e = 1$. In equation (8), note that $\pi^e = 1$ when $\pi_d = 2 - \tilde{\pi}_c - \underline{\pi}_c^e$, which is no bigger than 1 if $\tilde{\pi}_c + \underline{\pi}_c^e \geq 1$. For all $\pi_d \in [\tilde{\pi}_c - \underline{\pi}_c^e, 2 - \tilde{\pi}_c - \underline{\pi}_c^e]$, $\pi^e > \max\{\underline{\pi}_c^e, \tilde{\pi}_c\} = \tilde{\pi}_c$. Therefore, D will offer to settle at S^e, which $\pi_c \in [\underline{\pi}_c^e, \pi^e]$ will accept, and $\pi_c \in [\pi^e, 1]$ will reject and proceed to the panel stage. For all $\pi_d \in [2 - \tilde{\pi}_c - \underline{\pi}_c^e, 1]$, D will offer to settle at the upper bound $\pi^e = 1$, which all $\pi_c \in [\underline{\pi}_c^e, 1]$ will accept. At last, for all $\pi_d \in [0, \tilde{\pi}_c - \underline{\pi}_c^e]$, D will not settle. In this case, $\pi_c \in [\underline{\pi}_c^e, \tilde{\pi}_c]$ will withdraw the complaint and $\pi_c \in [\tilde{\pi}_c, 1]$ will go on to the panel procedure. These outcomes are illustrated in Figure 4 under the title "FW3".

Note that C views the probability that $\pi_d \in [2 - \tilde{\pi}_c - \underline{\pi}_c^e, 1]$ to be $\tilde{\pi}_c + \underline{\pi}_c^e - 1$. In that case, D will offer to settle at $\pi^e = 1$, which corresponds to $S^e = (1 - \tilde{\pi}_c)\frac{\delta^2\beta V}{1-\delta}$ (see equation (2)). Therefore, for $\pi_c = \underline{\pi}_c^e$, the expected payoff from filing is

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

Using the formula for S^e from equation (7), it can be shown that

$$E\Delta W_c^f(\underline{\pi}_c^e) = \frac{\delta\beta V}{1-\delta}[-(1-\delta)\tilde{\pi}_c + \delta\underline{\pi}_c^e(1-\tilde{\pi}_c)].$$

The condition that $E\Delta W_c^f(\underline{\pi}_c^e) = 0$ implies that $\underline{\pi}_c^e = \frac{(1-\delta)\tilde{\pi}_c}{\delta(1-\tilde{\pi}_c)}$. As the conditions on this equilibrium suggest, $\underline{\pi}_c^e$ has to be between zero and $\tilde{\pi}_c$ and such that $\tilde{\pi}_c + \underline{\pi}_c^e \geq 1$. These conditions translate correspondingly into the conditions on the scope of $\tilde{\pi}_c$. They are:

(a) $0 < \underline{\pi}_c^e$: This is automatically satisfied by the fact that $0 < \delta < 1$ and $0 < \tilde{\pi}_c < \delta$;

(b) $\underline{\pi}_c^e < \tilde{\pi}_c \Rightarrow \tilde{\pi}_c < \frac{2\delta-1}{\delta}$;

(c) $\underline{\pi}_c^e + \tilde{\pi}_c \geq 1 \Rightarrow \tilde{\pi}_c \geq \frac{1+\delta}{2\delta} - \frac{\sqrt{1+2\delta-3\delta^2}}{2\delta}$.

Therefore, this equilibrium can be summarized as follows:

$$\text{Equilibrium "FW3"} \begin{cases} \frac{1+\delta}{2\delta} - \frac{\sqrt{1+2\delta-3\delta^2}}{2\delta} \leq \tilde{\pi}_c < \frac{2\delta-1}{\delta} & \\ \underline{\pi}_c^e = \frac{(1-\delta)\tilde{\pi}_c}{\delta(1-\tilde{\pi}_c)} & \\ \pi^e = \frac{1}{2}(\pi_d + \tilde{\pi}_c + \underline{\pi}_c^e) & \forall\ \pi_d \in [\tilde{\pi}_c - \underline{\pi}_c^e, 2 - \tilde{\pi}_c - \underline{\pi}_c^e] \\ \pi^e = 1 & \forall\ \pi_d \in [2 - \tilde{\pi}_c - \underline{\pi}_c^e, 1] \\ \text{'not settle'} & \forall\ \pi_d \in [0, \tilde{\pi}_c - \underline{\pi}_c^e] \end{cases}$$

For $\pi_c \in [\underline{\pi}_c^e, \tilde{\pi}_c]$, they face a probability $\tilde{\pi}_c - \underline{\pi}_c^e$ that $\pi_d \in [0, \tilde{\pi}_c - \underline{\pi}_c^e]$, in which case, they will have to withdraw the dispute. This withdrawal probability, $\tilde{\pi}_c - \underline{\pi}_c^e = \tilde{\pi}_c - \frac{(1-\delta)\tilde{\pi}_c}{\delta(1-\tilde{\pi}_c)}$, can be shown to decrease as $\tilde{\pi}_c$ increases. Therefore, when the political cost $\tilde{\pi}_c$ increases further, the incidence of "withdrawal" outcome decreases further until it disappears, as is the case in the following two equilibria.

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

The next two equilibria still concerns the situation when $0 < \tilde{\pi}_c < \delta$. However, the magnitude of the cost $\tilde{\pi}_c$ is relatively large such that $\underline{\pi}_c^e < \tilde{\pi}_c$ will not be sustainable. In other words, for $\pi_c < \tilde{\pi}_c$, they will not attempt to file the complaint at all. Instead, in the equilibrium, $\underline{\pi}_c^e \geq \tilde{\pi}_c$ so that if D refuses to settle, all C who file will proceed to the panel procedure.

Suppose initially the lowest type of C who files is $\underline{\pi}_c$. Again, at the equilibrium, the expected payoff $E\Delta W_c^f$ for the lowest type of C who files should be non-negative. Unlike in the "FW1"

equilibrium, however, $E\Delta W_c^f$ for the lowest filing type can not be positive, because if it is, lower types of C than $\underline{\pi}_c$ will file the complaint. This will continue until $E\Delta W_c^f = 0$ for $\underline{\pi}_c^e$, which is still bigger than or equal to $\tilde{\pi}_c$, or continue until $\underline{\pi}_c^e < \tilde{\pi}_c$, which will fall into the former "FW" equilibria and contradict the premise. Therefore, at the equilibrium, $E\Delta W_c^f$ should be equal to zero for $\underline{\pi}_c^e$ ($\geq \tilde{\pi}_c$). Analogous to Equilibria "FW2–3", there are two possible scenarios, depending on the magnitude of $\tilde{\pi}_c$. They are "FP2" when $\tilde{\pi}_c$ is relatively small ($\tilde{\pi}_c + \underline{\pi}_c^e < 1$) and "FP3" when $\tilde{\pi}_c$ is relatively large ($\tilde{\pi}_c + \underline{\pi}_c^e \geq 1$).

Refer to equations (7) and (8) again. The condition $\tilde{\pi}_c + \underline{\pi}_c^e < 1$ implies that π^e will be less 1 for all possible types of D. For $\pi_d \in [\underline{\pi}_c^e - \tilde{\pi}_c, 1]$, $\pi^e > \max\{\underline{\pi}_c^e, \tilde{\pi}_c\} = \underline{\pi}_c^e$. Therefore, D will offer to settle at S^e, which $\pi_c \in [\underline{\pi}_c^e, \pi^e]$ will accept, and $\pi_c \in [\pi^e, 1]$ will reject and proceed to the panel. On the other hand, for all $\pi_d \in [0, \underline{\pi}_c^e - \tilde{\pi}_c]$, D will not settle, in which case, $\pi_c \in [\underline{\pi}_c^e, 1]$ will go on to the panel procedure. These outcomes are illustrated in Figure 4 under the title "FP2".

The condition on $\tilde{\pi}_c$ under which such an equilibrium will arise is derived as follows. Note that for $\pi_c = \underline{\pi}_c^e$, the expected payoff from filing is

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

Using the formula for S^e from equation (7) again, it can be shown that

$$E\Delta W_c^f(\underline{\pi}_c^e) = \frac{1}{4}\frac{\delta\beta V}{1-\delta}[\delta \underline{\pi}_c^{e2} + 2\delta(1-\tilde{\pi}_c)\underline{\pi}_c^e + \delta\tilde{\pi}_c^2 + (2\delta - 4)\tilde{\pi}_c + \delta].$$

The condition that $E\Delta W_c^f(\underline{\pi}_c^e) = 0$ implies that $\underline{\pi}_c^e = \tilde{\pi}_c + 2\sqrt{\frac{1-\delta}{\delta}}\sqrt{\tilde{\pi}_c} - 1$. As the conditions on this equilibrium suggest, $\underline{\pi}_c^e$ has to be bigger than $\tilde{\pi}_c$ and such that $\tilde{\pi}_c + \underline{\pi}_c^e < 1$. These conditions translate correspondingly into the conditions on the scope of $\tilde{\pi}_c$. They are:

(a) $\tilde{\pi}_c \leq \underline{\pi}_c^e \Rightarrow \tilde{\pi}_c \geq \frac{\delta}{4(1-\delta)}$;

(b) $\underline{\pi}_c^e + \tilde{\pi}_c < 1 \Rightarrow \tilde{\pi}_c < \frac{1+\delta}{2\delta} - \frac{\sqrt{1+2\delta-3\delta^2}}{2\delta}$.

Therefore, this equilibrium can be summarized as follows:

$$\text{Equilibrium ``FP2''} \begin{cases} \frac{\delta}{4(1-\delta)} \leq \tilde{\pi}_c < \frac{1+\delta}{2\delta} - \frac{\sqrt{1+2\delta-3\delta^2}}{2\delta} & \\ \underline{\pi}_c^e = \tilde{\pi}_c + 2\sqrt{\frac{1-\delta}{\delta}}\sqrt{\tilde{\pi}_c} - 1 & \\ \pi^e = \frac{1}{2}(\pi_d + \tilde{\pi}_c + \underline{\pi}_c^e) & \forall\ \pi_d \in [\underline{\pi}_c^e - \tilde{\pi}_c, 1] \\ \text{`not settle'} & \forall\ \pi_d \in [0, \underline{\pi}_c^e - \tilde{\pi}_c] \end{cases}$$

It can be shown that $\underline{\pi}_c^e - \tilde{\pi}_c = -1 + 2\sqrt{\frac{1-\delta}{\delta}}\sqrt{\tilde{\pi}_c}$ increases as $\tilde{\pi}_c$ increases. Therefore, as the cost $\tilde{\pi}_c$ increases, the portion of C who files, $(1 - \underline{\pi}_c^e)$, shrinks at a faster rate than the increase in $\tilde{\pi}_c$.

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

Use D's settlement decision equations (7) and (8) again. In this scenario, $\tilde{\pi}_c + \underline{\pi}_c^e \geq 1$ so that when $\pi^e = 1$, $\pi_d = 2 - \tilde{\pi}_c - \underline{\pi}_c^e$ is no bigger than 1. For all $\pi_d \in [\underline{\pi}_c^e - \tilde{\pi}_c, 2 - \tilde{\pi}_c - \underline{\pi}_c^e]$, $\pi^e > \max\{\underline{\pi}_c^e, \tilde{\pi}_c\} = \underline{\pi}_c^e$. Therefore, D will offer to settle at S^e, which $\pi_c \in [\underline{\pi}_c^e, \pi^e]$ will accept, and $\pi_c \in [\pi^e, 1]$ will reject and proceed to the panel. For all $\pi_d \in [2 - \tilde{\pi}_c - \underline{\pi}_c^e, 1]$, D will offer to settle at the upper bound $\pi^e = 1$, which all $\pi_c \in [\underline{\pi}_c^e, 1]$ will accept. At last, for all $\pi_d \in [0, \underline{\pi}_c^e - \tilde{\pi}_c]$, D will not settle, in which case, $\pi_c \in [\underline{\pi}_c^e, 1]$ will go on to the panel procedure. These outcomes are illustrated in Figure 4 under the title "FP3".

To derive the condition on $\tilde{\pi}_c$ under which such an equilibrium will arise, note that for $\pi_c = \underline{\pi}_c^e$, the expected payoff from filing is

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

The formula for S^e in equation (7) can be used again to show that

$$E\Delta W_c^f(\underline{\pi}_c^e) = \frac{\delta\beta V}{1-\delta}[\delta(1-\tilde{\pi}_c)\underline{\pi}_c^e - (1-\delta)\tilde{\pi}_c].$$

The condition that $E\Delta W_c^f(\underline{\pi}_c^e) = 0$ implies that $\underline{\pi}_c^e = \frac{(1-\delta)\tilde{\pi}_c}{\delta(1-\tilde{\pi}_c)}$. As the conditions on this equilibrium suggest, $\underline{\pi}_c^e$ has to be bigger than $\tilde{\pi}_c$ and such that $\tilde{\pi}_c + \underline{\pi}_c^e \geq 1$. These conditions translate correspondingly into the conditions on the scope of $\tilde{\pi}_c$. They are:

(a) $\tilde{\pi}_c \leq \underline{\pi}_c^e \Rightarrow \tilde{\pi}_c \geq \frac{2\delta-1}{\delta}$;

(b) $\underline{\pi}_c^e + \tilde{\pi}_c \geq 1 \Rightarrow \tilde{\pi}_c \geq \frac{1+\delta}{2\delta} - \frac{\sqrt{1+2\delta-3\delta^2}}{2\delta}$.

Therefore, this equilibrium can be summarized as follows:

$$\text{Equilibrium "FP3"} \begin{cases} \max\{\frac{1+\delta}{2\delta} - \frac{\sqrt{1+2\delta-3\delta^2}}{2\delta}, \frac{2\delta-1}{\delta}\} \leq \tilde{\pi}_c < \delta & \\ \underline{\pi}_c^e = \frac{(1-\delta)\tilde{\pi}_c}{\delta(1-\tilde{\pi}_c)} & \\ \pi^e = \frac{1}{2}(\pi_d + \tilde{\pi}_c + \underline{\pi}_c^e) & \forall\ \pi_d \in [\underline{\pi}_c^e - \tilde{\pi}_c, 2 - \tilde{\pi}_c - \underline{\pi}_c^e] \\ \pi^e = 1 & \forall\ \pi_d \in [2 - \tilde{\pi}_c - \underline{\pi}_c^e, 1] \\ \text{'not settle'} & \forall\ \pi_d \in [0, \underline{\pi}_c^e - \tilde{\pi}_c] \end{cases}$$

It can be shown that $\underline{\pi}_c^e - \tilde{\pi}_c = \frac{(1-\delta)\tilde{\pi}_c}{\delta(1-\tilde{\pi}_c)} - \tilde{\pi}_c$ increases as $\tilde{\pi}_c$ increases. Therefore, again, as the political cost $\tilde{\pi}_c$ increases, the portion of C who files, $(1 - \underline{\pi}_c^e)$, shrinks at a faster rate than the increase in $\tilde{\pi}_c$.

Equilibrium "NF": $\tilde{\pi}_c \geq \delta$

When $\tilde{\pi}_c$ is larger than δ, it can be shown that the expected payoff from the panel procedure, withdrawal, or settlement will all render C negative payoffs regardless of his type π_c. Therefore, C will not file the complaint. Let us denote this scenario Equilibrium "NF". This situation happens when the political cost $\tilde{\pi}_c$ is too high, and C will not attempt to bring the dispute against D.

The argument is as follows. First of all, recall that $E\Delta W_c^p = \pi_c \beta \frac{\delta^2}{1-\delta} V - \frac{1}{1-\delta} K^f$. It is straightforward to show that $E\Delta W_c^p = 0$ when $\pi_c = \frac{\tilde{\pi}_c}{\delta} \equiv \hat{\pi}_c$. In the case that $\tilde{\pi}_c \geq \delta$, it follows that $\hat{\pi}_c \geq 1$. Therefore, for all $\pi_c \in [0, 1]$, $E\Delta W_c^p < 0$. Second, since $\tilde{\pi}_c \geq \delta > 0$, it implies that $K^f > 0$. Therefore, $\Delta W_c^w = -K^f < 0$, for all types of C. Third, even if D is willing to settle at $\pi^e = 1$, i.e., with all possible types of C, the corresponding settlement amount is $S^e = (1 - \tilde{\pi}_c)\frac{\delta^2 \beta V}{1-\delta}$ (see equation (2)). The payoff to C is

$$\Delta W_c^s = S^e - K^f = (1 - \tilde{\pi}_c)\frac{\delta^2 \beta V}{1-\delta} - K^f = \frac{\delta^2 \beta V}{1-\delta}(1 - \frac{\tilde{\pi}_c}{\delta}) < 0,$$

because $\tilde{\pi}_c > \delta$. 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 is equivalent to $\underline{\pi}_c^e = 1$.

Implications:

The various sorts of equilibria discussed above and their corresponding parameter space are illustrated in Figure 5. Depending on the level of the discount factor, as the political cost $\tilde{\pi}_c$ increases, some equilibrium may not exist at all. At $\delta = \frac{2}{3}$, the three lines, "$\frac{\delta}{4(1-\delta)}$", "$\frac{1+\delta}{2\delta} - \frac{\sqrt{1+2\delta-3\delta^2}}{2\delta}$", "$\frac{2\delta-1}{\delta}$", cross one another. For larger discount factor relative to $\frac{2}{3}$, the equilibrium "FP2" does not exist. On the other hand, when the discount factor is relatively small, the equilibrium "FW3" is not sustainable. Otherwise, corresponding to a rising political cost $\tilde{\pi}_c$, the different kinds of equilibria emerge successively in the order that were discussed above.

Two implications follow immediately from the model above. First, recall from the discussion of the equilibria above that as the political cost $\tilde{\pi}_c$ increases, the incidence of "withdrawal" outcome increases at first (Equilibrium "FW1"), but then starts to decrease as $\tilde{\pi}_c$ continues increasing (Equilibrium "FW2"), and decreases furthermore (Equilibrium "FW3") until it disappears (Equilibrium "FP2"/"FP3"). Therefore, the most "withdrawal" incidence should occur at the point where equilibrium turns from "FW1" to "FW2". These ideas can be similarly illustrated by Figure 4. In Figure 4, the incidence of "withdrawal" outcome can be represented by the region denoted "w". The region starts small in Equilibrium "FW1" and grows large toward Equilibrium "FW2". As Equilibrium "FW2" begins, the area is substantial. However, the region will start to shrink toward Equilibrium "FW3" (if we assume the discount factor δ to be relatively high so that "FW3" but not "FP2" exists) and continue to shrink through it until the area disappears as in Equilibrium "FP3". Second, the equilibrium outcomes also suggest that as the political cost $\tilde{\pi}_c$ increases, the portion of C who files decreases monotonically. The portion of C who files can be represented by the segment $[\underline{\pi}_c^e, 1]$ as in Figure 4. As the political cost $\tilde{\pi}_c$ increases, the portion of C who files stays the same at first (Equilibrium "FW1"), but then starts to decrease as $\tilde{\pi}_c$ continues increasing (Equilibrium "FW2"), and decreases furthermore (Equilibrium "FW3" $\rightarrow$ "FP3") until it disappears (Equilibrium "NF").

Therefore, if we are willing to assume that the population of trade disputes are uniformly distributed across different pairs of subjective predictions (π_c, π_d), then corresponding to different levels of political cost $\tilde{\pi}_c$, we should observe some systematic patterns of filing and withdrawal. When the political cost $\tilde{\pi}_c$ is very low, a lot of complaints will be filed but relatively few complaints will be withdrawn (as in Equilibrium "FW1"). When the political cost $\tilde{\pi}_c$ is medium, fewer

complaints will be filed but a lot of them will be withdrawn (as in Equilibrium "FW2"). When the cost $\tilde{\pi}_c$ is high, even fewer complaints will be filed and relatively few will be withdrawn (as in Equilibrium "FW3"). Finally, the cost becomes so high that very few complaints will be filed and none of them withdrawn (as in Equilibrium "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 to the 1980s when we witnessed a surge in both the litigation activities (115 complaints) and cases withdrawn (40 cases).

To understand the data, we can use the results from the model above and assign a likely level of political cost to each decade that might be experienced on average by all countries of utilizing the GATT dispute settlement system. Judging from the amount of complaints and withdrawn cases in each decade, the order of magnitude of political cost for each decade, starting from small, 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 treated as ordinary business, with no significant feeling of hostility about it. Therefore, the international political cost of using the GATT dispute settlement procedure should not be 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 of these groups demanded greater freedom from the GATT obligations and the former urged a negotiated, diplomatic approach to all policy conflicts instead of resorting to the formal GATT legal procedures. This "antilegalist" position won enough adherents, including the US, among developed countries that it created a climate in which formal legal claims were viewed as unfriendly actions. Therefore, it corresponds in the model to a very high international political cost for a complaint during this decade.

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

5 Conclusion

This paper develops a unified theoretical model of the dispute settlement mechanism to explain the stylized facts observed across different decades of the GATT/WTO regimes. At the panel stage, it first investigates the benefits and costs that disputants might have faced when they decided to block an adverse panel ruling under the GATT and how the new appellate procedure under the WTO has altered the disputants' incentive structure to challenge a panel ruling. The model explains the surge in blocking incidence during the 1980s over the preceding GATT years and the immense frequency at which the new appellate procedure under the WTO is invoked. At the consultation stage, this paper then studies the effects of political power on countries' incentives to use, and interactions in using, the GATT/WTO dispute settlement mechanism. It is shown that the magnitude of the political cost relative to the potential benefit that the complainant stands to gain when 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 us 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.

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Table 1: Blocking/Appealing Incidence of Panel Reports under the GATT/WTO

Regimes	Pre-Tokyo Round			Post-Tokyo Round	WTO
Decades	1950s	1960s	1970s	1980s	1995–2000
Total Rulings	21	5	15	47	46
(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	36
Percentage of Total Rulings	5%	0%	0%	21%	78%

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

Note 4: The data on the WTO era were taken from Park and Umbricht (2001). Their number on "Total Rulings" here excluded some panel reports whose time for appeal had not run out and some other panel reports for reasons specified therein.

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		1995–2000	
Total Complaints	53	7	32	115		219	
Cases in Progress						116	
Rulings	21 (40%)	5 (71%)	15 (47%)	47	(41%)	55	(53%)
Settled	22 (42%)	2 (29%)	12 (38%)	28	(24%)	35	(34%)
Withdrawn or Abandoned	10 (19%)	0 (0%)	5 (16%)	40	(35%)	13	(13%)

Note 1: The data were compiled from Hudec (1993, p. 287) and Park and Umbricht (2001) for complaints filed under the GATT and the WTO regimes, respectively.

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

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

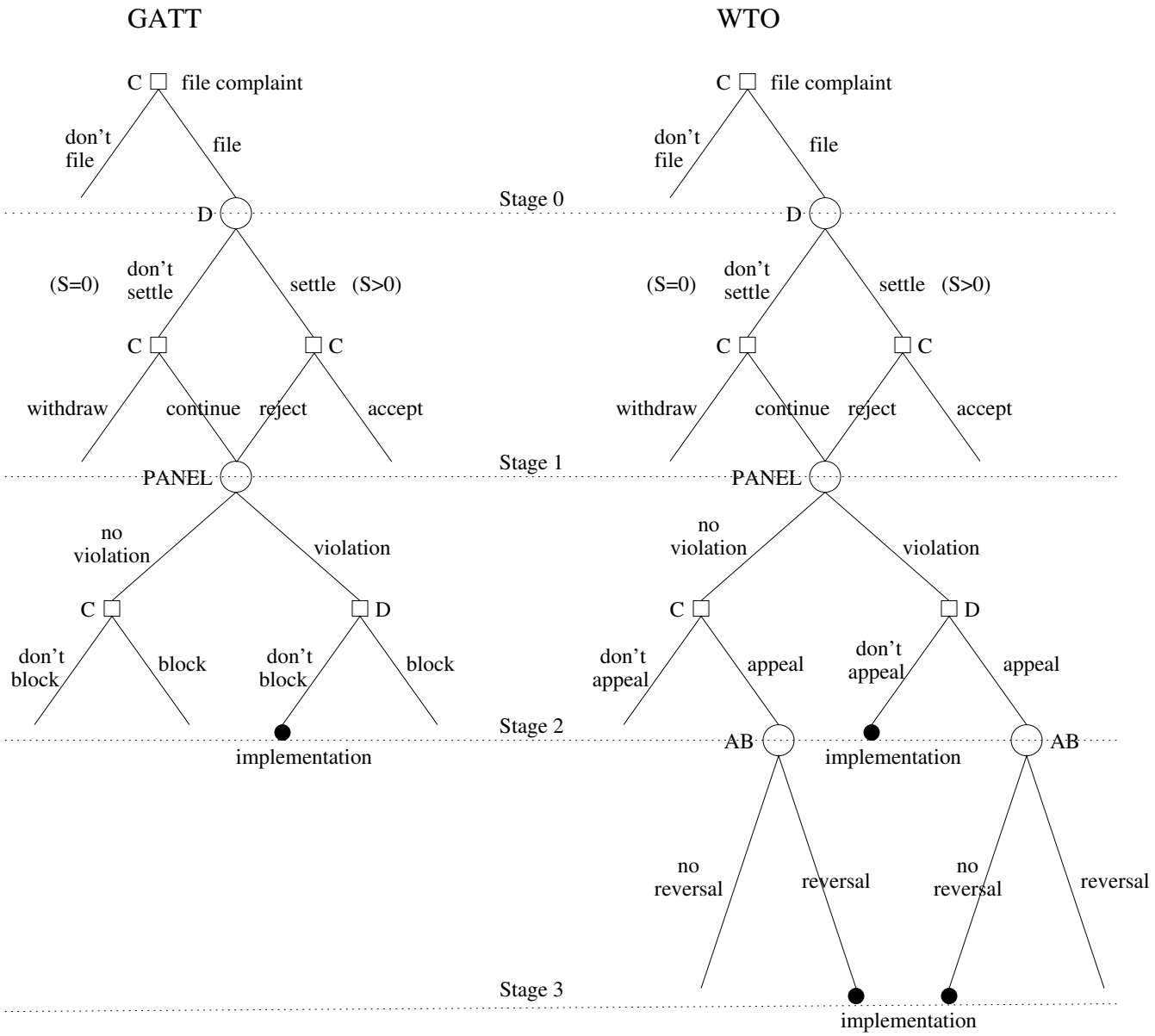
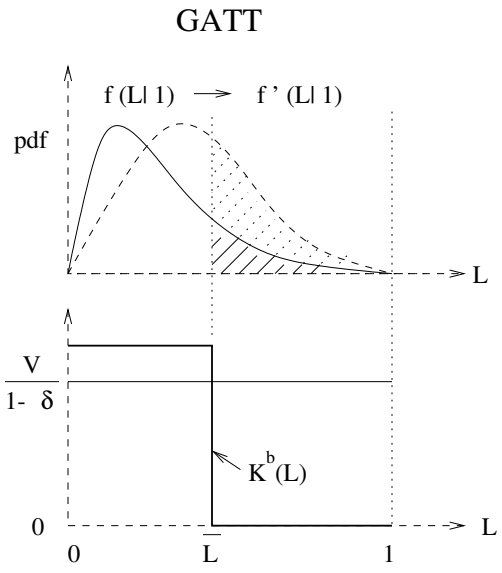
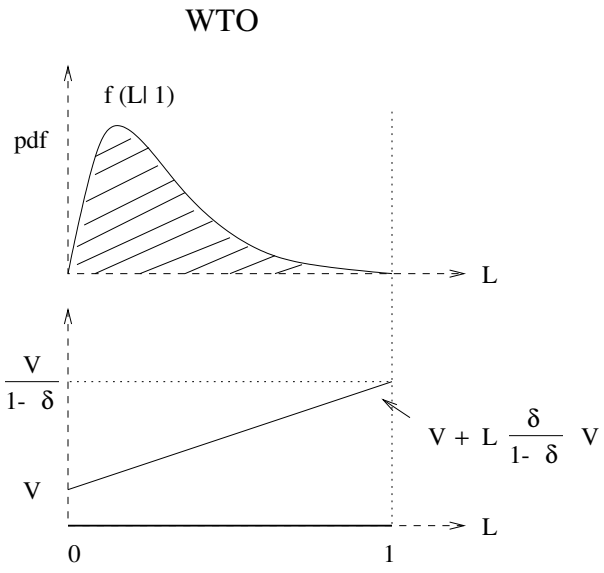


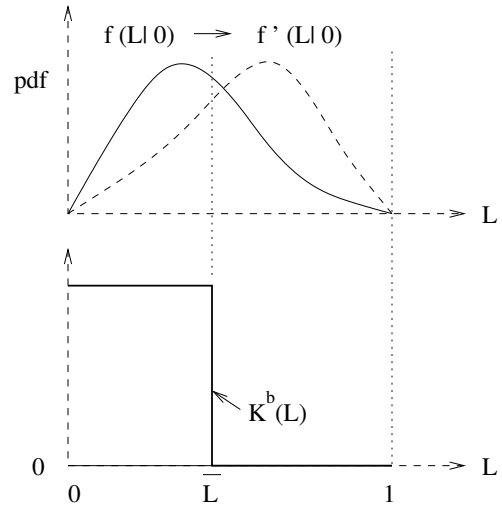
Figure 2: Incentives and Frequencies of Complainants and Defendants to Block/Appeal a Panel Report



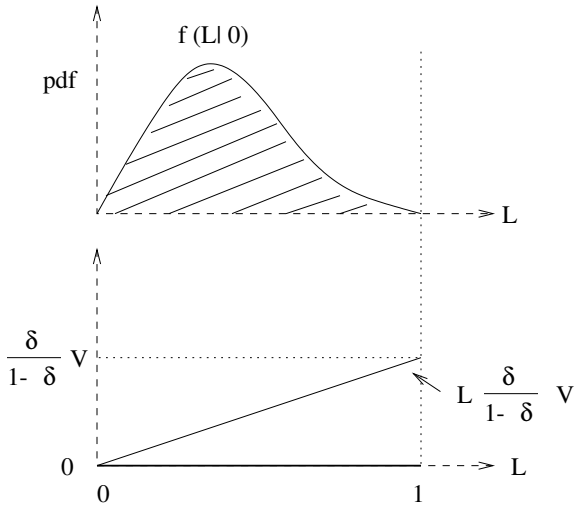
cost & benefit to D of blocking a "violation" ruling



cost & benefit to D of appealing a "violation" ruling



cost & (zero) benefit to C of blocking a "no violation" ruling



cost & benefit to C of appealing a "no violation" ruling

Figure 3: Defendant's Settlement Decision

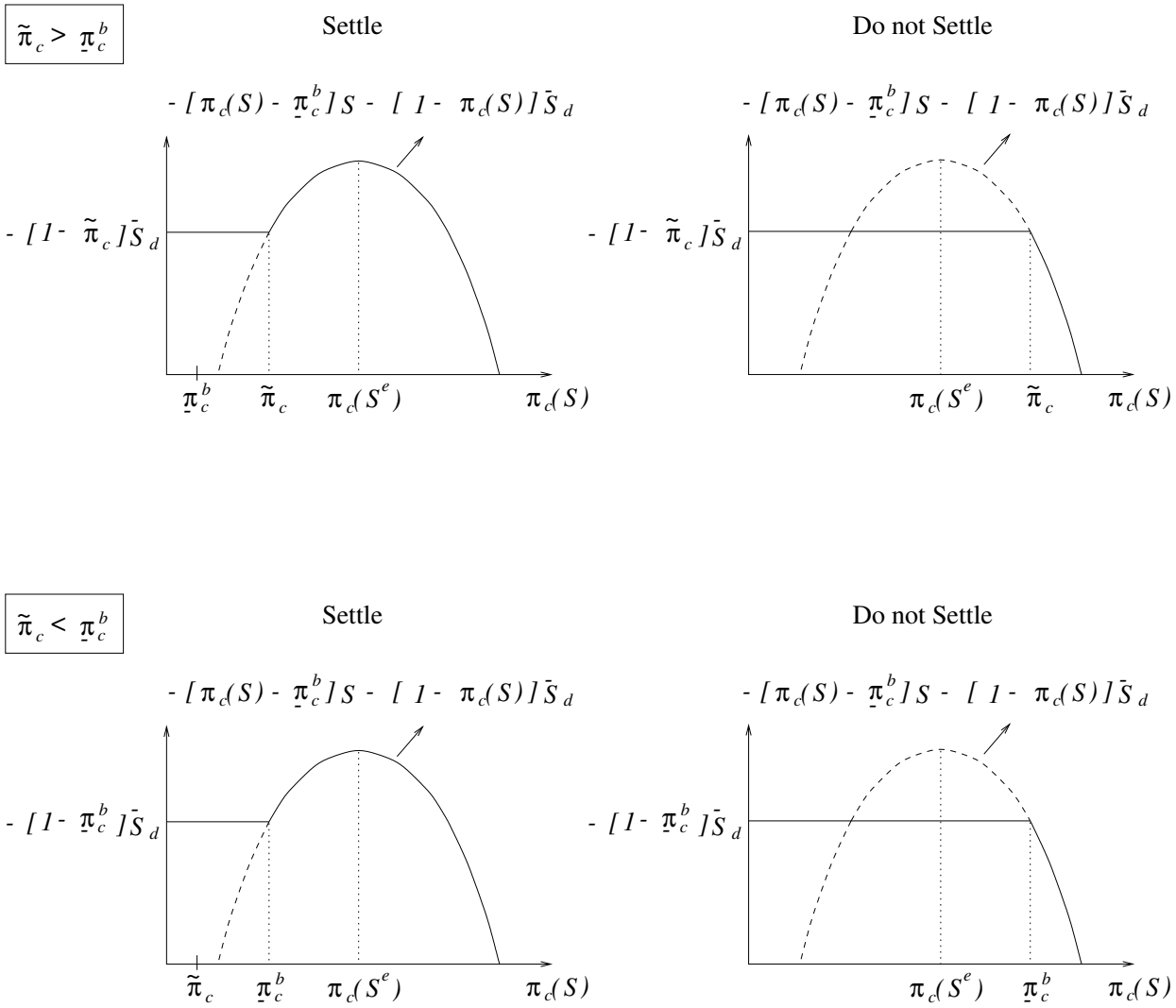


Figure 4: Equilibrium Outcomes as $\tilde{\pi}_c$ Varies ($\tilde{\pi}_c < \delta$)

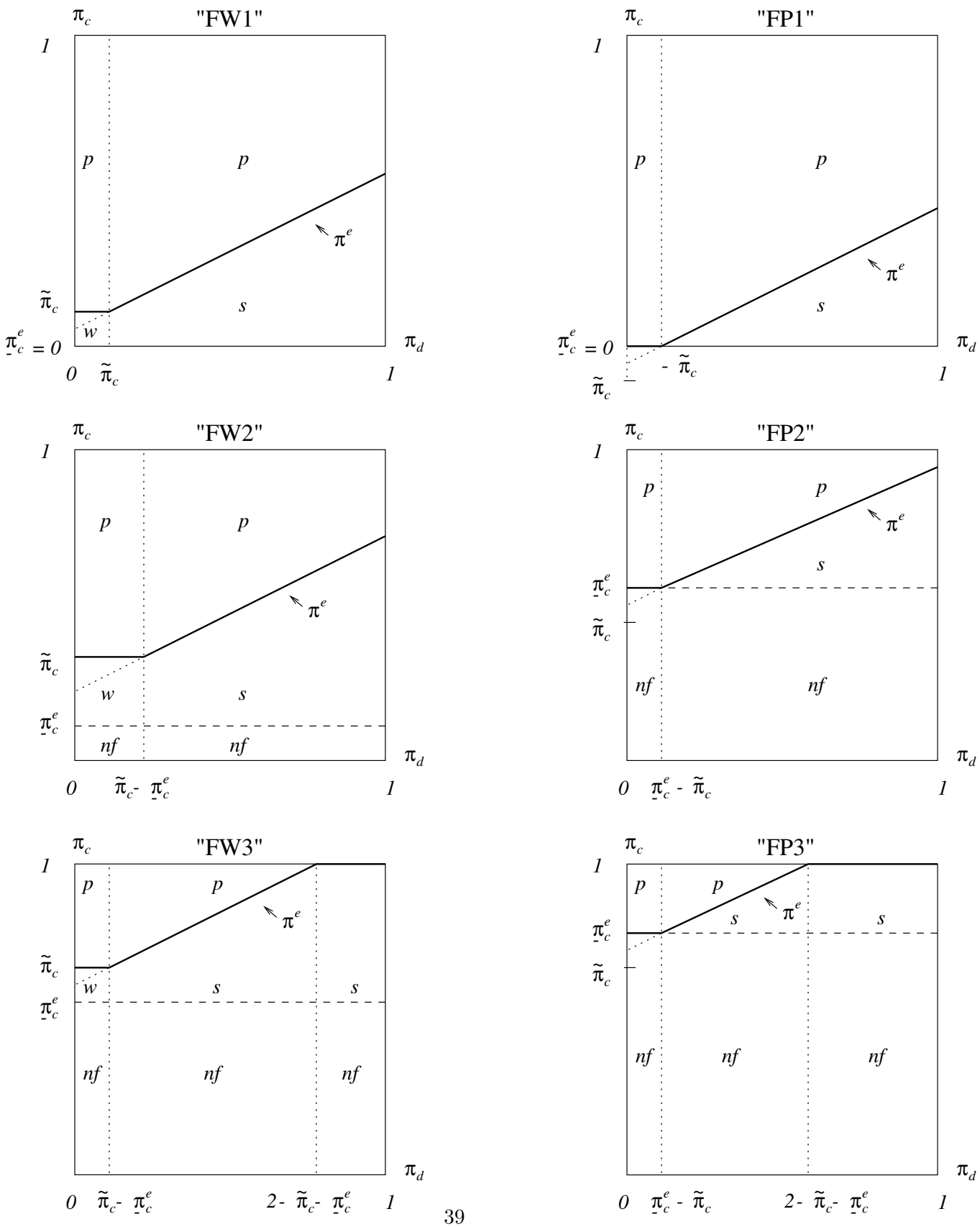


Figure 5: Parameter Space and Corresponding Equilibrium

