Why are so many antidumping petitions withdrawn?

Thomas J. Prusa*

Department of Economics, State University of New York at Stony Brook, Stony Brook, NY 11794-4384, USA

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The number of antidumping petitions initiated has increased dramatically in recent years. However, only one-third of antidumping cases actually result in dumping duties being levied. Surprisingly, nearly as many antidumping cases are withdrawn or are voluntarily terminated. We present data that show that these withdrawn cases have at least as great an effect on trade as cases which resulted in duties. We discuss legal reasons why such settlements are possible and present a model of the bargaining process. We find that petitions with low probability of success ('nuisance' suits) actually confer large gains to both domestic and foreign firms.

1. Introduction

The number of antidumping petitions initiated has increased dramatically in recent years. In 1986, for instance, over 70 antidumping petitions were initiated by U.S. firms. This is an extremely large number especially when one realizes that fewer than 20 petitions were initiated in 1981. Many observers interpret this trend as an indication of a greater incidence of dumping than in previous years; however, there is a growing suspicion that countries, limited in their use of tariffs and quotas by GATT agreements, are now using the fair trade laws as a remedy for various economic woes [UNCTAD (1984), Yarrow (1987)]. Moreover, it is becoming increasingly evident that many businessmen view antidumping law as an offensive weapon, even though the law was clearly intended to be a defensive statute. For instance, one author recently wrote

"Every U.S. business should be aware of, and seek protection against, the increasingly pervasive effects of foreign imports with in the U.S. market."

Correspondence to: T.J. Prusa, Department of Economics, State University of New York at Stony Brook, Stony Brook, NY 11794-4384, U.S.A.

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Companies should consider the *offensive* use of the U.S. trade laws as a *strategic business tool* in the same sense as more traditional elements of business planning such as research and development, capital investment, productivity improvements . . . [Hartquist (1987, p. 54, emphasis added)].

There is, however, very little definitive evidence that firms are in fact abusing the law. The fact that more cases are being initiated does not imply that more duties are being levied or that the United States has become more protectionist. For example, only nine cases resulted in dumping duties in both 1980 and 1984, even though twice as many cases were initiated in 1984. One interpretation of the data is that the International Trade Commission (ITC) is able to maintain its objectivity and eliminate frivolous cases, and hence that current antidumping law remains an efficient mechanism for insuring fair trade. Others argue that the large increase in antidumping petitions reflects that the mere initiation of an investigation against a foreign rival benefits the domestic industry by harassing the foreign rival, a tactic referred to in the legal literature as the *interrorem* effect.

Since Viner's (1923) seminal exposition on dumping, trade theorists have been preoccupied with developing theories that explain why firms might price discriminate across markets [Brander and Krugman (1933)] or engage in below-cost sales [Davies and McGuinness (1982), Ethier (1982)], and have failed to analyze the economic effects of how antidumping law is implemented. Recently, a number of authors have begun to address this issue [Prusa (1987), Ethier and Fischer (1987), Fischer (1988), Messerlin (1988, 1989)]. There is much to be learned by examining how trade laws are implemented. For example, a review of antidumping case history reveals that only a relatively small percentage of cases result in duties, and this is not because the majority of cases are rejected. Many antidumping cases are resolved with settlement agreements; moreover, these agreements have significant efficiency and welfare effects. By 'settlement agreement' we mean a negotiated agreement between the parties (with or without government intervention) which results in some type of price or quantity undertaking. Given that many antidumping cases are settled, an accurate understanding of the welfare affects of antidumping law should account for this outcome.

In the legal literature it is argued that the settlement agreements are desirable since they save the government investigative expense and also reduce the international tensions created by dumping actions. This viewpoint, of course, assumes that the settlements mimic the expected ITC decisions. If, however, firms use the settlement agreements to achieve collusive outcomes, the efficacy of such agreements must be severely questioned. This paper will measure and analyze the effect of the settlement agreements and compare them with the effect of levying dumping duties. We find that empirically
these settlements entail greater distortions than those associated with the imposition of dumping duties. We interpret this as evidence that an antidumping investigation allows firms to achieve outcomes that are unattainable in a standard noncooperative trade environment.

The paper proceeds as follows. Section 2 presents data on the incidence of antidumping actions and analyzes the economic effect of these cases, and discusses the legal issues behind the settlement option. Section 3 presents a stylized bargaining model that is used to analyze the magnitude of the settlements and the affect of the legal rules governing the agreements. The bargaining over the price undertakings is modeled as a Nash bargaining problem. The use of this solution concept can be justified using the known relationship between the Nash solutions and noncooperative dynamic bargaining. In particular, the outcome of the cooperative bargaining process, as characterized by the Nash bargaining solution, is identical to the subgame perfect equilibrium of a noncooperative bargaining game. Concluding comments are made in section 4.

2. Antidumping investigations and trade

Traditionally, economists have modeled the proceedings of an antidumping investigation as follows [see fig. 1(a)]: (1) a domestic industry bands together, collects data, and files a petition with the ITC against a foreign industry at a cost of $C_1$; in the absence of governmental intervention, the industries compete noncooperatively; (2) within 45 days the ITC issues a preliminary determination; a negative finding ends the investigation; (3) given the information signalled by the ITC's preliminary finding, the domestic firms have an opportunity to withdraw the petition; if the case is not withdrawn, the industry incurs additional ongoing legal expenses of $C_0$; (4) if the petition is not withdrawn, the ITC issues its final determination no later than 420 days after the petition was originally initiated.

Referring to fig. 1(a), let $\Pi_N - C_1$ denote the domestic industry's net profit when the petition is withdrawn, where $\Pi_N$ is the domestic industry's 'no dumping duty' oligopoly profit and $C_1$ reflects the costs of initiating a petition. To keep things as simple as possible we will think of the domestic industry as acting as a single player, and hence we will use the terms industry and firm interchangeably. In section 3 we will specify more carefully how $\Pi_N$ is determined, but for the time being we will take it as given.

Let $p$ denote the probability that the ITC will levy dumping duties and $\Pi_D$ denote the profit that will be earned by the domestic industry if dumping duties are levied against the foreign industry. Clearly, $\Pi_D > \Pi_N$. The domestic

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1 In fact, the petition is filed simultaneously with the ITC and the Commerce Department. For the issues analyzed in this paper, we can assume without loss of generality that the ITC is the lone decision-maker.
firm’s expected profit, given that the investigation proceeds to a final ITC decision, can be written as

$$E\Pi = \rho \Pi_D + (1 - \rho) \Pi_N - C_I - C_O,$$

$$= \Pi_N + \rho(\Pi_D - \Pi_N) - C_I - C_O. $$

Under the traditional model of antidumping actions, the case will be withdrawn only if

$$\rho(\Pi_D - \Pi_N) - C_O < 0. \quad (1)$$

However, since the bulk of the legal expenses are sunk and the ongoing legal expenses are relatively small, we would expect most cases to proceed to a
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Table 1

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<tr>
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<tbody>
<tr>
<td>Dumping duties</td>
<td>10  (27%)</td>
<td>5    (23%)</td>
<td>13   (20%)</td>
<td>19  (41%)</td>
<td>10  (14%)</td>
<td>25   (40%)</td>
<td>82   (27%)</td>
</tr>
<tr>
<td>Petition rejected</td>
<td>9    (24%)</td>
<td>6    (40%)</td>
<td>21   (32%)</td>
<td>5   (11%)</td>
<td>43  (58%)</td>
<td>20   (32%)</td>
<td>104  (35%)</td>
</tr>
<tr>
<td>Petition withdrawn</td>
<td>18   (49%)</td>
<td>4    (27%)</td>
<td>31   (48%)</td>
<td>22  (48%)</td>
<td>21  (28%)</td>
<td>18   (29%)</td>
<td>114  (38%)</td>
</tr>
<tr>
<td>Total no. of cases</td>
<td>37</td>
<td>15</td>
<td>65</td>
<td>46</td>
<td>74</td>
<td>63</td>
<td>300</td>
</tr>
<tr>
<td>initiated</td>
<td></td>
<td></td>
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<td></td>
<td></td>
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</tr>
</tbody>
</table>

Note: Numbers in parentheses are the percent of the total cases initiated for that year.

Source: Author's compilation from various issues of U.S. International Trade Commission *Annual Report.*

In a sense, the null hypothesis of the traditional model is that very few petitions would be withdrawn.

We can use table 1 to help us analyze how well this standard model describes antidumping actions. Table 1 gives a breakdown of the outcomes of antidumping cases initiated between 1980 and 1985. The cases can be broadly classified into one of three ways: petition accepted (duties levied), petition rejected, and petition withdrawn. It is clear that initiating a petition by no means implies that duties will be levied – on average duties were levied only 27 percent of the time. It is somewhat surprising that each of the three possible outcomes accounts for approximately a third of the outcomes. As aforementioned, since the large fraction of legal fees and expenses are sunk we would expect few cases to be withdrawn. The rather large percentage of withdrawn petitions suggests that the characterization depicted in fig. 1(a), and summarized by eq. (1), does not accurately describe the proceedings.

In fact, typically the withdrawal of an antidumping petition is not evidence that the domestic industry’s case has failed. Frequently a petition is withdrawn only after the domestic industry has achieved some type of out-of-court settlement with its foreign rival. The settlement may involve either a price undertaking or a quantity restriction. Furthermore, settlements can be made with or without governmental approval. Therefore a more accurate characterization of the proceedings should incorporate the ability of the domestic industry to extract a settlement from its foreign rival. Since settlements are possible, the extensive form representation depicted in fig. 1(b) is more appropriate. This characterization is identical to that in fig. 1(a) except that we allow the domestic and foreign industries to negotiate before

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2The ongoing expenses (for the domestic industry) are relatively small since once the petition is filed, the ITC carries out its own investigation. In a sense, the ITC is an arbitrator, using the data each side presents (along with collecting its own data) to come to a binding decision. See Barshefsky and Cunningham (1981) for a discussion of legal expenses incurred in an antidumping investigation.
the final ITC decision. Referring to fig. 1(b), let $\pi_S - C_1$ denote the net profit from settling, where $\pi_S$ is the profit resulting from a settlement. We would expect $\pi_S > \pi_N$. As before, $\pi_N + \rho(\pi_D - \pi_N) - C_1 - C_O$ denotes the expected profit when the investigation proceeds to a final ITC decision. In this framework, if

$$\pi_N + \rho(\pi_D - \pi_N) - C_O < \pi_S,$$

the case will be settled. Since the foreign rival can offer to restrict its prices/quantity to insure $\pi_S > \pi_N$, this latter model is more consistent with the large number of petition withdrawals.

The ability to achieve a settlement is similar to litigants bargaining over an out-of-court settlement. The domestic industry, or the plaintiff, files a petition against its foreign rival, or the defendant. The award/penalty is the change in profits when the dumping duty is levied. The analogy underlies the legal literature's benign view of settlements. In the standard litigation model [Shavel (1982)] the parties are merely negotiating how to divide the damages and since legal fees are costly, it will be beneficial for risk-neutral parties to settle. In the context of an antidumping case, the parties would negotiate how much prices will be changed.

There are, however, a number of problems with this analogy. Unlike the standard legal examples, the amount of damages is not fixed. In fact, given that the parties are competitors in a market, it is possible that a price restriction could benefit both parties. This issue will be more fully discussed in the following sections. Furthermore, the foreign and domestic firms are competitors in a market, and these price/quantity agreements restrain trade. One would expect that such agreements violate antitrust law. However, there has never been an antitrust action due to an antidumping settlement. There are several reasons why the settlement option is likely to be exempt from antitrust prosecution. First, many cases are settled under the auspices of the U.S. government. That is, the U.S. Trade Representative (USTR) acts on behalf of the domestic industry and negotiates the settlement with the foreign government/industry. Even though these settlements may be anticompetitive, the domestic firms are not directly involved, and therefore they are not directly engaged in anticompetitive behavior. Once the USTR has negotiated the settlement, the domestic industry withdraws its petition. Second, in many other cases the antidumping petition is withdrawn after the foreign industry voluntarily raises its prices or restricts its quantities. Thus, the settlement outcome may involve tacit rather than direct collusion between parties. Third, the settlement process is protected by the legal principle called the *Noerr–Pennington* doctrine. The *Noerr–Pennington* doctrine is a judicially created antitrust exemption for lawful efforts to obtain legislative, judicial, or executive action. The *Noerr–Pennington* doctrine implies that antitrust
considerations must be subordinated to the firms' constitutional right to participate in the legislative process. Even though the doctrine was formulated with domestic issues in mind, it appears that it applies equally to cases involving international parties. The Noerr-Pennington exemption broadens the scope for relief and allows the domestic industry to withdraw its petition after achieving a settlement. All in all, considering that it is the domestic firms who initiate the petition and given the variety of ways a settlement can be achieved, it is plausible that a number of antidumping petitions are filed explicitly with the intent of obtaining a settlement offer.

The data in table 2 quantify the effects of these settlement agreements. The table compares the value of trade in the year after the petition was resolved

\[\text{Table 2}
\]

<table>
<thead>
<tr>
<th>Product subject to antidumping/countervailing duty petitions in 1980</th>
<th>Ratio of 1981 value of trade to 1980 value of trade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duties levied</td>
<td>0.44</td>
</tr>
<tr>
<td>Petition rejected</td>
<td>1.12</td>
</tr>
<tr>
<td>Petition withdrawn</td>
<td>0.57</td>
</tr>
<tr>
<td>All cases</td>
<td>0.77</td>
</tr>
<tr>
<td>All imports</td>
<td>1.09</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Product subject to antidumping/countervailing duty petitions in 1981</th>
<th>Ratio of 1982 value of trade to 1981 value of trade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duties levied</td>
<td>0.84</td>
</tr>
<tr>
<td>Petition rejected</td>
<td>1.07</td>
</tr>
<tr>
<td>Petition withdrawn</td>
<td>0.80</td>
</tr>
<tr>
<td>All cases</td>
<td>0.92</td>
</tr>
<tr>
<td>All imports</td>
<td>0.97</td>
</tr>
</tbody>
</table>

with the value of trade in the year the petition was filed. A number less than one implies that trade fell the year following the petition. This table is based upon data collected by the United Nations in 1982. The products involved in each antidumping case are identified by a seven-digit TSUSA code. The TSUSA codes were used to calculate trade volume for those products involved in antidumping investigations.5

We look first at those products that were subject to investigation during 1980 (the upper panel of table 2). Those products that had antidumping petitions rejected had a 1981 trade value that was 112 percent of their 1980 value—a number nearly the same as the change in the value of all imports (109 percent). This suggests that a petition by itself does not adversely affect competition and hence that the domestic industry does not gain a strategic advantage over its foreign rivals by merely initiating a petition. In other words, this suggests that the in terrorem effect is not evidenced in the data.

In comparison, those products that were granted protection (i.e. had duties levied) had a 1981 trade value that was only 44 percent of its 1980 value. This is exactly what theory suggests should be observed—the imposition of duty on a product will lower the demand for the product. The fall in trade as a result of duties is generally recognized as the main reason why domestic firms initiate antidumping petitions.

Thus, the data clearly show the great advantage to having a petition accepted rather than rejected. Somewhat surprisingly though, we do not observe a great difference between a petition that results in duties being levied and a petition that is withdrawn. For instance in 1980–1981, the value of trade fell to 57 percent of its previous value for those products that had petitions withdrawn. This suggests that, on average, withdrawing a petition has nearly the same effect as having duties levied. The 1981–1982 data confirm these findings. In particular, for the 1981–1982 period, dumping duties lowered the value of trade to 84 percent of its previous value while petition withdrawals were associated with a value of trade that was 80 percent of its previous value. In summary, two key facts emerge from this analysis. First, the imposition of antidumping duties significantly reduces the growth in the value of trade relative to either those products that had petitions rejected or those that were not involved in an antidumping case. Second, petition withdrawals have essentially the same effect on the growth in the value of trade as does levying duties.

While it is possible that these settlements actually increase domestic welfare (since on average they achieve the same outcome as the ITC but save the ITC investigative expense) one must question whether this is a plausible interpretation of the data, especially in light of the fact that not all

5Unfortunately, the United Nations does not report trade data for antidumping cases alone. Since the legal procedures involved in countervailing duty investigations are very similar to antidumping investigations, the results are likely to be consistent with antidumping cases alone.
withdrawn cases involve agreements. Unfortunately, given the way the government reports case outcomes, it is difficult to determine precisely which cases are withdrawn with a settlement and which are withdrawn without any type of an agreement. This ambiguity is due in part to the fact that an agreement with governmental assistance is only one way a settlement might be achieved. UNCTAD (1984) estimates that only 50 percent of the withdrawn cases involve agreements.6 Since many cases do not involve any agreement and those cases withdrawn without an agreement do not restrain trade, the simple averages presented in table 2 underestimate the true restraint of trade that is implied by a settlement. Clearly, UNCTAD's estimate implies that the subset of cases involving agreements must restrain trade by far more than duties. Vermulst (1987) estimates that nearly 80 percent of the petitions withdrawn involved some type of settlement. Although this estimate somewhat attenuates the magnitude of the trade restraint implied by settlements, it still implies that settlement agreements must restrain trade by more than duties do. Regardless which estimate is correct, the general insight – that on average a settlement has a large and significant impact on trade – is nonetheless confirmed. These results make it clear that a normative analysis of antidumping law that only discusses how duties affect consumers ignores an important way in which the law affects welfare.

Using either UNCTAD's or Vermulst's estimate we find that settlement agreements grant significant market power to domestic firms. Even though domestic firms may prefer settling, they cannot unilaterally impose a settlement agreement on their foreign rivals. The foreign firms will only agree to settle with the domestic firms when they too gain from an agreement; however, if the foreign firms prefer settling, the desirability of such agreements must be carefully questioned. For instance, if the settlement implies that the price received by the foreign firm for its products is the same as it would be if the ITC levied duties, the agreement is probably desirable. On the other hand, if the settlement allows the foreign firm to price in such a way that it earns greater profits than it would without an antidumping action, we must question the use of such settlement agreements. This would suggest that the settlements promote collusion rather than fair trade. We analyze this issue in the following section.

3. Price agreements and the nature of competition

The model developed in this section is aimed at explaining the empirical facts discussed in the preceding section and clarifies whether settlements are

6It should be noted that UNCTAD's method of classifying cases differs slightly from the ITC's method. It seems likely that UNCTAD's calculations underestimate the true percentage of cases involving assurances and thus overestimate the fall in trade involved in a settlement agreement.
welfare-improving. By welfare we are referring to consumer’s welfare. In particular, the model shows (1) why initiating a petition creates the opportunity for settlements that are mutually beneficial relative to the expected ITC outcome and also relative to free trade, and (2) why the rules governing the settlement process crucially influence how beneficial such settlements are.

Consider a market with two risk-neutral firms, one foreign and one domestic, which sell slightly differentiated products. For convenience, we will denote foreign variables with an asterisk. Furthermore, we will assume that each firm sets price and can sell all output demanded at that price. Note that in many applications the outcome of the game is extremely sensitive to the choice of strategic variable [Bulow, Geanakoplos and Klemperer (1985)]; however, the results of this model are robust to whether firms choose prices or quantities.7

We will assume that there exists a unique, stable Nash equilibrium and that in equilibrium both firms’ prices and output are strictly positive.8 Denote the domestic (foreign) firm’s best response function as \( \beta(P^*)[\beta^*(P)] \). The Nash equilibrium is defined by the two-tuple \((P_D, P_F)\) which satisfies \( \beta^*(P_F) = P_D^* \) and \( \beta(P_D^*) = P_F^* \).

Fig. 2 depicts the Bertrand–Nash equilibrium in price space. \( \beta(P^*) \) defines the domestic firm’s price that allows the highest iso-profit loci to be reached, given \( P^* \). \( \beta^*(P) \) can be interpreted in a similar fashion. The Nash equilibrium is at point \( n \). The foreign and domestic firms’ Nash profits are \( \Pi^*_F = \Pi^*(P_D, P_F^*) \) and \( \Pi^*_D = \Pi(P_D, P_F^*) \), respectively. The point \( s^*(s) \) is the Stackelberg leader equilibrium when the foreign (domestic) firm can pre-commit to a price.

Fig. 3 depicts the Nash equilibrium, \( n \), in profit space. The profit possibilities attainable in any period are also depicted in fig. 3. The curve \( m^*jm \) is the profit possibilities frontier (PPF). This frontier is the locus of maximum profit attainable by the firms. Any point on or below this frontier is attainable by a suitable pair of prices \( \{P, P^*\} \). The point \( m^*(m) \) depicts the monopoly level of profit for the foreign (domestic) firm while \( j \) depicts the joint profit-maximizing level of profits. As is well known, the Nash profit levels are strictly interior to the efficient locus. It is clear that both firms could be made better off if they could commit to prices that would generate profits on the profit frontier on the segment \( uy \) (or, more generally, the region northeast of \( n \)).

This simple Nash equilibrium will serve as a benchmark case which we will compare with an alternative situation. Consider the case when an antidumping petition has been initiated, and the ITC has given preliminary

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7The crucial condition is that the joint Nash profits are less than the joint monopoly profits, which is satisfied for both Bertrand and Cournot competition.
8Friedman (1983) discusses the sufficient conditions for these conditions to hold.
Fig. 2. Bertrand-Nash equilibrium in price space.

approval. This allows us to concentrate on the economic aspects of the bargaining process. From this viewpoint the costs of the petition $C_1$ are sunk and hence do not affect the bargaining process. Furthermore, for simplicity we assume that $C_0 = 0$. Allowing $C_0 > 0$ does not change the nature of the results and only complicates the notation. If dumping is determined, a specific duty of $(P_D^* - P_N^*)$ will be levied on the foreign product. The price domestic consumers face is $P_D^*, P_D^* > P_N^*$, while $P_N^*$ is collected by the foreign firm. In order to highlight the bargaining process we will assume that if duties are levied, the foreign firm continues to collect only $P_N^*$; however, it is clear that the foreign firm will have incentives to alter its pricing behavior when faced with the duty.

With the foreign firm burdened with duties, the domestic firm will charge $P_D = \beta(P_D^*), P_D > P_N$. For notational convenience, let $\Pi_D^\beta = \Pi^\beta(P_D, P_N^*)$ and $\Pi_D = \Pi(P_D, P_N^*)$. If duties are levied, the foreign firm will earn $\Pi_n - (P_D^* - P_N^*)Q_D^\beta$, where $(P_D^* - P_N^*)$ is the specific duty and $Q_D^\beta$ is the quantity demanded of the foreign product at prices $(P_D^*, P_N^*)$. In other words, $(P_D^* - P_N^*)Q_D^\beta$ is the dumping duty revenue collected by the government. The conditions that guarantee a unique Nash equilibrium [Friedman 1983] also imply

$$\Pi_D^\beta - (P_D^* - P_N^*)Q_D^\beta < \Pi_N^\beta.$$
If duties are levied, the domestic firm will earn \( \Pi_D \). If the petition is rejected, the firms will earn Nash profit levels, \( \{\Pi_N, \Pi_N^*\} \). Put another way, the firms’ pricing strategies are determined by the ITC’s decision. If duties are levied, the foreign firm’s price \( P_D^* \) is assigned by the ITC; the domestic firm then sets its price knowing that duties have been levied; therefore \( P_D = \beta(P_D^*) \). If duties are not levied, the foreign firm’s pricing strategy is not hindered by the ITC and thus the firms just charge their Nash equilibrium prices, \( P_N \) and \( P_N^* \).

The antidumping duty equilibrium, \( \{\Pi_D, \Pi_N^*-(P_D^*-P_N^*)Q_D^*\} \), is depicted by point \( d \) in fig. 3. The point \( e \) depicts the firms’ profits if the foreign firm did not have to pay the dumping duty (i.e. if it collected \( P_D^* \) instead of \( P_N^* \) per unit). Note that the diagram depicts the case when \( P_D^* \) is sufficiently large so that \( \Pi_N^* < \Pi_N \); this need not be the case. In particular, if \( P_D^* \) is in the neighborhood of the Stackelberg leader price, the foreign firm would earn greater profit at the higher price if it did not have to pay the duty.

The ITC has only two options: levying duties or rejecting the petition. However, because the injury and less than fair value determinations involve a tremendous amount of data collection and calculation, it is quite possible the ITC will make mistakes (owing to observation error). Moreover, because many of the calculations involve highly subjective decisions (i.e. which
exchange rate is relevant, how much of the import penetration is due to unfair practices, how to adjust for product differences, etc.), even if the foreign firm has not dumped, it may not be able to convince the ITC. Let \( \rho \) denote the ex ante probability that the ITC will levy duties. Assuming that the firms are risk-neutral and that \( \rho \) is common knowledge, we can write the expected profit of the domestic and foreign firm as

\[
E\Pi(\rho) = \rho \Pi_D + (1 - \rho) \Pi_N
\]

and

\[
E\Pi^*(\rho) = \rho \left[ (\Pi_D^* - (P_D^* - P_N^*)Q_D^*) \right] + (1 - \rho) \Pi_N^*. 
\]

Let \( E(\rho) = (E\Pi(\rho), E\Pi^*(\rho)) \). This point is depicted in profit space in fig. 3. The line segment between points \( n \) and \( d \) depicts the firms' expected profits if the antidumping case is not settled. If it is likely that the ITC will find dumping (e.g. \( \rho \) close to one), \( E(\rho) \) lies closer to the point \( d \); conversely, if it is extremely unlikely that the ITC will find dumping, \( E(\rho) \) lies closer to the point \( p \).

In addition to ITC determined outcomes, the firms always have the option of settling the agreement. We will consider two alternative regulatory environments that govern how the settlement outcome is determined. These two regulatory environments are based on the procedures for expedited relief as defined in the Trade Adjustment Act of 1979. Let \( \Pi_S = \Pi(P_S, P_N^*) \) and \( \Pi_S^* = \Pi^*(P_S, P_N^*) \) denote profit levels that will be achieved via negotiation for the domestic and foreign industries, respectively. One set of rules governing the settlement process will be referred to as Settlement via ITC Sanctioned Suspension (SANC). The second set of rules governing the settlement process will be referred to as Settlement via Private Negotiation and Withdrawal (PRIV).

Under SANC rules an agreement to suspend the petition must (i) be agreed upon by the parties, and (ii) must be determined (by the ITC) to be in the 'public interest'. We interpret this rule as imposing the following constraints on the settlement offers: (i) \( \Pi_S^* \geq \Pi^*(\rho) \) and \( \Pi_S \geq \Pi(\rho) \), and (ii) \( P_S^* \leq P_D^* \). In other words, SANC rules constrain the potential prices over which the firms can negotiate. This seems to be a plausible interpretation, for according to the antidumping code

Proceedings may be suspended . . . without the imposition of provisional measures or antidumping duties upon receipt of satisfactory voluntary undertakings. . . . Price increases under such undertakings shall not be higher than necessary to eliminate the margin of dumping [Lorenzen (1979, p. 1429)].

In contrast, under PRIV rules an agreement must only be agreed upon by
the parties. There are no explicit restrictions imposed by the antidumping code. Therefore, under this rule a settlement offer only has to satisfy \( \Pi_S^* \geq \Pi^*(\rho) \) and \( \Pi_S \geq \Pi(\rho) \).

If the domestic firm asks for a suspension, the ITC must approve the terms of the settlement offer. On the other hand, the firm may opt to negotiate a settlement unencumbered by the ITC. In this latter case, once an agreement is made the domestic firm will withdraw the petition and petition the ITC to terminate its investigation. While the ITC always has the right to continue the investigation there has never been a case where it has failed to terminate its investigation when requested to do so.

It appears that the main advantage the SANC process offers the domestic firm is that it makes it more difficult for the foreign firm to renege or shirk on its agreement. Within practical limits, the private agreement that instigated the petition withdrawal is also enforceable – the petition can always be refiled. Thus, for the remainder of this paper we will examine settlement offers under each procedure assuming the agreements are enforceable.

We first examine when the firms will opt to settle. The alternative for either firm is to make unacceptable demands, and then wait for the ITC’s decision. If the case is not settled, the firms’ security level of profits is \( E(\rho) \). The bargaining game is solved using the well-known Nash bargaining solution. [See Roth (1979) for an excellent discussion.] The Nash bargaining solution states that if the set of profit opportunities over which the firms bargain is convex, there exists a unique settlement offer, \( \{\Pi(\Pi_S, P_S^*), \Pi^*(\Pi_S, P_S^*)\} \), that satisfies

\[
\max_{(\Pi_S, P_S)} [\Pi(\Pi_S, P_S^*) - E\Pi(\rho)] [\Pi^*(\Pi_S, P_S^*) - E\Pi^*(\rho)]. \tag{5}
\]

The price undertakings, \( \{P_S^*, P_S\} \), are implicitly defined by (5). We relegate the proof that the set of prices over which the firms bargain is convex to the appendix.

The negotiation set under SANC rules is defined by the shaded region in fig. 3. The negotiation set is found by maximizing weighted profits subject to the constraints that (i) \( \Pi(\Pi_S, P_S^*) \geq E\Pi(\rho) \) and \( \Pi^*(\Pi_S, P_S^*) \geq E\Pi^*(\rho) \), and (ii) \( P_S^* \leq P_S^* \). Clearly, the restriction on the foreign firm’s price also restricts the domestic firm’s optimal price. As depicted in fig. 3, the restriction on the

\*The following quote from the U.S. code governing antidumping law suggests that agreements are enforceable. ‘Violation of a suspension agreement will lead to ... resumption of the investigation... An intentional violation will result in civil fraud penalties’ [Barshefsky and Cunningham (1981)].

\*There are a number of examples of U.S. firms withdrawing petitions, and then later filing essentially the same complaint with the ITC.
foreign firm's price offers implied by SANC rules causes the boundary of the negotiation set to be strictly interior to the PPF. If $P^*_B$ is sufficiently large, the boundary of the negotiation set could coincide with the PPF.

In contrast, the negotiation set under PRIV rules is defined by the points northeast of $E(p)$ in the feasible set. The negotiation set under PRIV rules is found by maximizing weighted profits subject to the constraints that $\Pi(P, P^*_S) \geq E\Pi(p)$ and $\Pi^*(P, P^*_S) \geq E\Pi^*(p)$. The boundary under PRIV rules is the PPF.

The Nash bargaining solution implies that the firms will choose prices that maximize (5). This in turn implies that the solution must lie on the upper boundary of the negotiation set. We can graphically depict the Nash bargaining solution by finding the tangency of the upper boundary of the negotiation set and a rectangular hyperbola that is asymptotic to the broken lines through $E(p)$. Along this rectangular hyperbola $[\Pi(P, P^*_S) - E\Pi(p)][\Pi^*(P, P^*_S) - E\Pi^*(p)]$ is constant. In profit space, the point $x_5$ depicts the solution under SANC rules, while $w_5$ depicts the solution under PRIV rules.

We summarize the above discussion with the following proposition.

**Proposition 1.** Assume common knowledge over $\rho$. The Nash bargaining solution exists under either set of settlement rules. In other words, under either SANC or PRIV settlement rules, there exist settlement offers that guarantee both firms will earn no less profit than the expected ITC decision.

Proposition 1 states that there exist mutually advantageous settlement possibilities for any $\rho$ and thus that the negotiation set is nonempty under either set of rules. Even in the limit ($\rho = 1$), the firms can always at least bargain over the duty revenue. This suggests that we should not be surprised when we observe so many antidumping cases withdrawn.

The chief advantage of using the Nash bargaining solution is that we do not have to explicitly model the bargaining process. This does not imply that that bargaining game is a black-box. Rather, we can use Binmore's (1987) formulation of the Nash bargaining solution to describe a noncooperative bargaining game whose outcome is defined by (5). Binmore (1987) shows that the solution defined by eq. (5) is equivalent to a subgame perfect equilibrium of a noncooperative bargaining game. The noncooperative bargaining game described by Binmore requires us to assume that (i) a common discount rate summarizes the parties' impatience with respect to the outcome, (ii) the negotiations can be divided into discrete periods, and (iii) the foreign and domestic firms make offers in alternating periods. These are not terribly binding assumptions. For instance, perfect capital mobility will imply a single world interest rate which would justify (i). Furthermore, since the firms have approximately one year to negotiate before the ITC reaches its final decision,
it would be natural to divide the bargaining game into a day-by-day negotiation game where we assume the foreign firm makes offers on odd days and the domestic firm makes offers on even days. If an offer is accepted, the petition is settled. A subgame equilibrium of this game is defined by (5).

Since both firms are willing to settle the antidumping case, this implies that both prefer settling to the expected ITC outcome. Even when it is highly unlikely that antidumping duties will be levied (i.e. \( \rho \) close to zero) the foreign firm prefers to settle since it allows the firms to revise their prices upwards. The domestic firm will also prefer to settle in this case since continuing with the petition will almost certainly result only in \( \Pi_N \). Conversely, when it is very likely that antidumping duties will be levied (i.e. \( \rho \) close to one) the foreign firm prefers to settle since it avoids paying duties. The domestic firm will settle only if it is assured of at least \( \Pi_D \); it is always in the best interest of the foreign firm to offer a price undertaking that ensures this.

This does not imply that the foreign firm prefers settling to Nash competition. Certainly, if \( P_B^* \) is in the neighborhood of the foreign firm's Stackelberg leader price it will prefer settling to Nash competition, for any value of \( \rho \). However, if \( P_B^* \) is sufficiently large, then the foreign firm may benefit from settling (\( \Pi_B^* > E\Pi^*(\rho) \)) but it will be forced to commit to such large price undertakings that its profits are lower than under Nash competition (i.e. \( \Pi_B^* < \Pi_B \)). For example, under SANC rules and \( \rho = 1 \) the foreign firm will earn \( \Pi_B^* \) which may be smaller than \( \Pi_B \). In this case, the settlement outcome mimics the expected ITC decision.

Interestingly, a settlement will most clearly fail to mimic the expected ITC decision when \( \rho \) is small. From (5) we see that the negotiated outcome will always give both firms no less profit than the expected ITC outcome; if \( \rho \) is small, \( E\Pi(\rho) \approx (\Pi_N, \Pi_B^*) \). Any small price revision in the neighborhood of \( n \) will raise both firms' profits. Thus even under SANC rules we find that a 'nuisance suit' (i.e. a suit with small \( \rho \)) will benefit both firms, and hence will promote tacit collusion. This result sharply contrasts with the interpretation of nuisance suits found in the legal literature, where it is argued that they are aimed at harassing the foreign firm and do not directly raise profits. The value of a nuisance suit is most dramatically evidenced when \( \rho = 0 \); in this case the foreign firm need not make any price revision. One would hope the bargaining outcome would approximate the ITC's own decision. However, the opportunity to cooperate allows the firms to mutually offer to raise their prices and achieve collusive profit levels. In fact, if the firms are symmetric, the Nash bargaining outcome of a nuisance suit will entail the firms sharing the joint profit-maximizing level of profits.

As this discussion suggests, the parameter \( \rho \) plays an important role in determining the efficacy of the bargaining game. In this model, the negotiation sets are defined by the legal rules (SANC or PRIV) and prices
The parameter \( \rho \) shifts the security level of profits. As \( \rho \) increases, bargaining power is shifted toward the domestic firm and away from the foreign firm. Changes in \( \rho \) will entail changes in the settlement level of profits. As \( \rho \) increases, the domestic firm's profits will increase and the foreign firm's profits will decrease. Under SANC rules if \( \rho = 1 \), the domestic firm is indifferent between settling and letting the case continue through the ITC. In contrast, the foreign firm will strictly prefer to settle and avoid paying the duty. Under SANC rules, the only loss to consumer welfare is the loss of the duty revenue. Under PRIV rules, there will be an additional loss to welfare. For all but the most extreme cases, the point \( e \) will be the interior of the PPF. Therefore, from (5) the negotiated outcome under PRIV rules will lead not only to a loss of duties but also to greater profit for both firms relative to \( E(\rho) \).

The preceding analysis reveals that under either set of legal rules, the settlement option can lead to collusive outcomes. A few comments are in order. First, the argument that private settlements mimic the expected ITC decision (and therefore are welfare increasing) is fallacious. Note that even if \( \rho = 0 \) the foreign firm will always benefit from the settlement process. Second, the settlement process in an antidumping investigation is fundamentally different from the typical bargaining games analyzed in the literature. The standard bargaining games analyze how two players should decide to divide a 'pie'. The difference in this problem is that not only are the firms trying to decide their share of the pie, but they also have the ability to increase the size of the pie! By choosing relatively moderate price increases, both firms can earn greater profits, which is far different from the original intent of the law. The ITC could make the settlement process a fixed-size pie problem if it more strictly regulated the settlement process. For instance, the ITC could more tightly restrict price revisions and charge the firms an approval fee equal to the expected duties. Under these circumstances the settlement outcome would more closely parallel the expected ITC decision. This type of scheme is not implemented of course, since settlements are politically desirable. Third, the empirical findings reported in section 2 discussed the effect of settled cases in terms of trade data, while the model in section 3 focuses on the effect of settled cases in terms of profits. In general, the model's predictions are consistent with the empirical results. In particular, the larger profits that emerge from the bargaining game will imply a fall in trade. The model does predict that we should observe significant differences in trade when comparing cases that are settled with those that are rejected. However, the data also suggest that there is a greater restraint of trade when cases are settled than when duties are levied. This may not be implied by the model. For instance, under SANC rules, the settled price \( P_{SF} \) must be no greater than \( P_{SN} \). If the case was not withdrawn and the ITC levied duties, the domestic firm would charge \( P_D = \beta(P_{DF}) \). By the optimality of the best
response function, we know that this is the highest price the domestic firm would offer under SANC rules. This implies that when compared with a settlement under SANC rules, the ITC outcome \( \{P_n, P_h^\} \) would involve the least trade. Therefore, with the bargaining model discussed above, settled outcomes could involve more or less restraints on trade than the ITC decision. Fourth, unless one of the parties fears that the other will cheat on the settlements, the model predicts that firms should prefer settling under PRIV rules rather than SANC rules.

4. Concluding comments

The rise of administered protection during the past twenty years is quite worrisome. Traditional models and analysis of protection do not adequately describe the true effects of the new protectionism. For instance, the data and analysis presented in this paper reveal that antidumping petitions have had a much greater effect on trade than previously thought. Trade data indicate that withdrawn cases restrict trade by at least as much, and probably more than, dumping duties. This behavior is consistent with the argument that U.S. firms are using antidumping laws for reasons other than the original intent of the law. The Noerr–Pennington doctrine provides firms with an antitrust exemption and grants them the right to achieve private settlements.

This paper presents a stylized bargaining model of the settlement process. The concept of a Nash bargaining solution is used to solve for a unique equilibrium. The value of the model is that the key incentives driving the settlement process are clarified. Even when the agreement must be in the public interest, the ability to avoid dumping duties and cooperate on pricing decisions makes it strictly preferred to the expected ITC decision. The desirability of achieving a settlement is increased when the firms do not need ITC approval. One interpretation of the model is that antidumping petitions serve as a vehicle to achieve cooperative levels of profits.

Finally, note that economists typically argue that levying dumping duties increases producer surplus at the expense of consumer surplus. If antidumping petitions were resolved only via official ITC decisions, then this is a legitimate argument. However, since many petitions are withdrawn after a settlement agreement one needs to reconsider the traditional analysis of antidumping duties. One possible interpretation of the data and analysis in this paper is that levying duties may actually increase consumer surplus since the alternative is not free trade but rather a negotiated outcome.

Appendix

Proof that the bargaining set is convex. We will show the bargaining set is convex under either set of bargaining rules.
Assume SANC rules. In fig. 3 let $c_1$ depict the profits $(\Pi(P_D, P_N^S), \Pi^*(P_D, P_N^S))$, $c_2$ depict the profits $(\Pi(P_N, P_N^S), \Pi^*(P_N, P_D^S))$, $n$ depict the profits $(\Pi(P_D, P_D^S), \Pi^*(P_D, P_D^S))$, $e$ depict the profits $(\Pi(P_D, P_D^S), \Pi^*(P_D, P_D^S))$, and finally let $d$ depict the profits $(\Pi(P_D, P_D^S), \Pi^*(P_D, P_D^S) - (P_D^S - P_N^S)Q_D^S)$.

The attainable set is defined by maximizing weighted profits subject to $P_D^S \leq P_D^S$. In fig. 2 (price space) this set is defined by $\{P, P^S\} \in c_1, nec_2$. In fig. 3 (profit space) this set is defined by the frontier $c_1x_1x_2e$. Note that this set is concave and compact in both price and profit space. The concavity of this set in profit space follows directly from the concavity of each firm's profit function. The negotiation set is defined as the subset of the attainable set which gives the firms at least $E(\rho)$.

Assume PRIV rules. Without the additional constraint on the foreign prices the attainable set is defined by the PPF. This set is concave and compact in both price and profit space. The concavity of this set in profit space follows directly from the concavity of each firm's profit function. Q.E.D.

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