Does Anti-dumping Enforcement Generate Threat?

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Abstract

The last two decades witnessed countries across the world being guided by the statues of multilateral trading institutions (e.g., WTO, IMF) in order to promote free and fair trade through gradual reduction in trade barriers. However, we still find dumping and few other trade strategies of the exporting countries as a major hindrance to free and fair trade. This led to "contingent protection" as a tool of *new-protectionism*. Among the contingent protection measures, anti-dumping has evolved as the most popular strategy choice for the trading nations. The anti-dumping policy invokes a threat to the exporter and thereby can change its strategic behaviour. We describe the phenomenon of dumping through a price-leadership model and thereby compute the *optimal* level of anti-dumping duty that can *offset* dumping. Using a sequential game, we conclude that the credible threat of an AD duty restricts dumping and thereby leads to a win-win situation for both the foreign and domestic firms.

***Keywords*:** Price-leadership, Dumping, Anti-dumping duty, Sequential game
***JEL Classification codes*:** C02, C72, D43, F13, L40

1. Introduction

The post-war period had witnessed international trade been mainly guided by the multifarious statues of the multilateral trading institutions (e.g., IMF, WTO) whose major objectives were to promote *free* and *fair* trade. One of such means was by gradually bringing down the tariff rates, abolishing quota and other trade restrictions. Initially, the emerging economies (e.g., India, Argentina, Brazil and South Africa, among a few others) were not in favour of accepting the *new* trade policies framed by these institutions. These economies were sceptical because exposing the domestic economy to international competition can create distortions in the form of *material injury* to the firms in the respective home country.[1] In response to the divergence in trade policies of developed and developing countries, WTO [GATT (1948) and in subsequent rounds of deliberations] provided a platform for the harmonization of the same and thereby promoting world trade. One such policy measure was providing protection through *contingent protection*.

Contingent protection comprises of Anti-dumping (AD) measures, Countervailing and Safeguard measures. AD duty is used by the importing country to offset the price advantage exploited by the foreign firms on their low priced exports. An anti-dumping initiation has two components: (i) a dumping component based on price discrimination (i.e., export price below the *normal value*) and (ii) the 'material injury'.[2] Under the WTO rules [Uruguay Round (1994)], AD duty can *only* be applied if these two conditions are satisfied simultaneously. Countervailing measures on the other hand, help the domestic firms in offsetting the advantages that the foreign firms posses in terms of an export subsidy given by their respective home countries. Lastly, the safeguard measures allow a grace period to those importing countries whose domestic industries have lost comparative advantage due to the competition faced from huge imports. The intricate process of the safeguard and countervailing measures make them quite conservative in nature among the trading countries. On the contrary, AD procedures are flexible and gets over within a period of 18 months; moreover, it is case specific which is unlike the typical tariff policy. It is argued that AD has a unique combination of economic and political applicability; Prusa, 2001. On the other hand, Finger, 1993, demonstrates that anti-dumping as practised today comprises largely of *bad*

[1] Material Injury to any industry means the actual or potential decline in sales, profit, output, market share, productivity, return on investment, etc. See, Article 3 of GATT (1994) for details.

[2] AD initiation refers to the legal procedural action taken by an importing country in order to investigate an imported product subsequently taken up by government authorities in both importing and exporting countries.

economics and *power politics*.[3] See, Bekker, 2006, for similar arguments. AD law justifies the trade restriction it creates. Moreover, this law allows meagre firms to initiate AD cases, bring imports under scrutiny and thereby protect themselves from competition. Otherwise, the low priced exports can be countered with orthodox trade protectionist measures.

The main theme of the paper is to explore whether the (credible) threat of an AD enforcement by the import competing domestic firm would alter the decision of foreign exporting firm with regard to selling *below* the 'normal value'.

1.2 Anti-dumping — Its Popularity and Concerns

Market distortions in the form of dumping signal price changes that over time lead to various market adjustments. If these disturbances are temporary, then there would be few adjustments. One such temporal adjustment is imposition of an anti-dumping duty. The emergence of new protectionism in the form of anti-dumping across the developing nations seems to be mostly concerned with safeguarding the domestic industries against these market distortions. Sometimes, nations use AD initiations as a threat to counter attack low priced exports or to protect their own sick industries.

The dawn of the 21st century marked the centennial year (2004) of the anti-dumping measures and also by this time it had become the (trade) policy choice for both developing and developed nations. Particularly, in the last two decades 'new' AD users (comprising of India, Argentina, Brazil, Mexico and South Africa, among a few others) have outpaced the 'traditional' AD users (U.S., Canada, Australia, New Zealand and the European Community) in terms of AD filings. In the immediate aftermath of the Uruguay Round, these 'new' AD users had initiated AD complaints at an unprecedented rate. Compared to 1980s when only a handful of nations had anti-dumping codes, over 40 nations had joined the AD club in the 1990s.

The significant spurt in AD activities across the world over the period 1980-2011 has led to the dilemma of *whether anti-dumping is actually a form of protection from genuine harmful*

[3] Practitioners of anti-dumping laws have mechanized ways to convert initiations into measures. Turning down an anti-dumping initiation by the government allows the practisers to find another means to make the case into an affirmative one.

practices or is it just a modified form of a protectionist measure?[4] Recent available data reveal that AD initiations constitute around 89% of the total contingent protection measures all over the world and are significantly greater when average tariff rates across the globe have been declining.

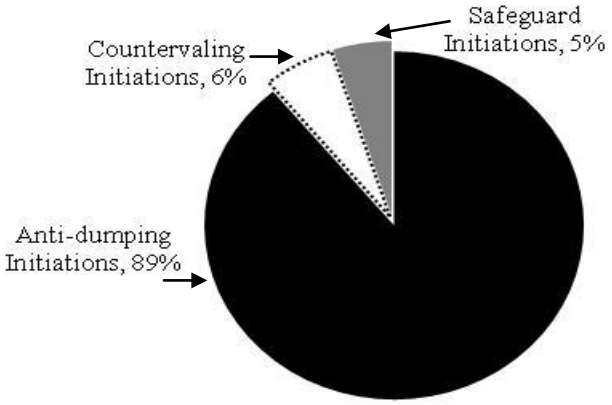

Figure 1: Distribution of Various Contingent Protections, 1995 – 2011
Data Source: WTO Reports on Anti-dumping, Safeguard and Countervailing Initiations

Since the Uruguay Round till date, WTO data specify India as the top users of AD. The first AD initiation of India was in 1992 against the U.S., Japan and Brazil for the product PVC resin. In particular during the period 1995-2011, India has filed 16% of all global anti-dumping cases, quite disproportionate to its share in global imports (2.04% in 2010-11).[5] As the economy progressively opened up under the statutes of multilateral trading institutions, India's share in global AD activities also increased.

[4] Prior to the 1980s there were less than 100 AD cases across the world; whereas, in the period between 1995 and 2011 there were more than 250 cases on an average every year.
[5] Authors' calculation based on 2010-11 data available in the WTO Statistics data base.

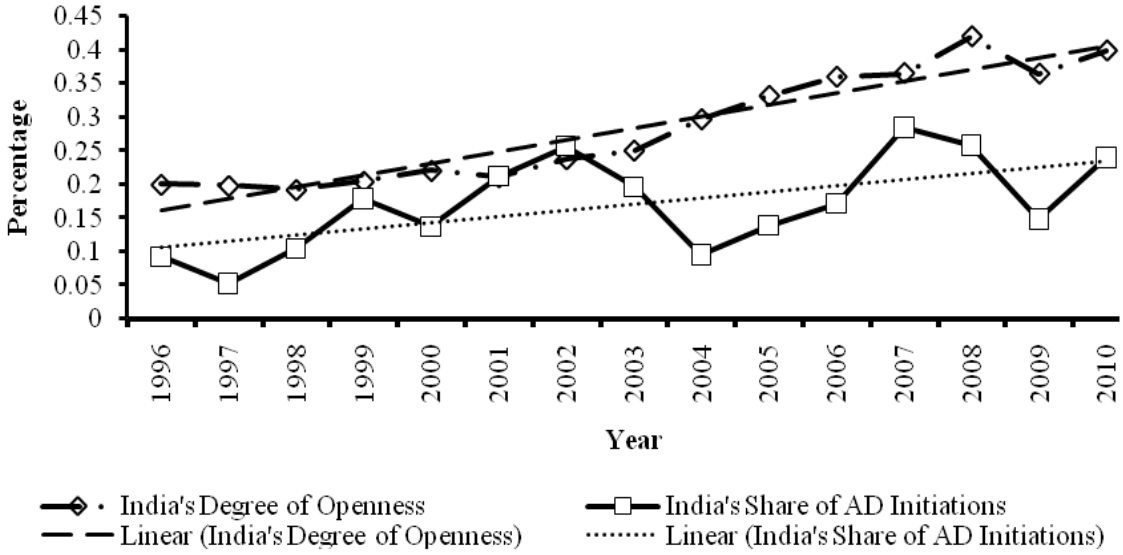

Figure 2: Anti-dumping Initiations and Degree of Openness in India

Data Source: WTO Reports on AD Initiations; WTO Statistics Database and The World Development Indicators (World Bank).

Note: India's Share in AD Initiations is defined as a ratio of India's AD Initiations to World AD Initiations. Degree of openness is calculated as a ratio of trade to GDP (in current year prices).

Most of the products which face AD initiations and measures are products of Chemical and Allied industries, Plastic and Rubber articles, Textiles, Base Metals, Machinery and Mechanical appliances. These industries alone initiated around 91% of AD cases during the period 1995-2011. Out of these initiations, around 61% have been converted into measures. With so many initiations across India and other nations, there is a concern among scholars of whether anti-dumping has moved away from the original intentions that created it (i.e., protection from *predatory* dumping). We do not answer such questions in this paper. However, we believe that credible threat of AD enforcement would alter trade practices of the foreign (exporting) firm with respect to selling *below* the 'normal value' and move towards free and fair trade.

The itinerary of rest of the paper is as follows. Section 2 focuses on the main theme of the paper. *With the backdrop of a price leadership model, we argue whether threat of an AD duty on the foreign firm, can effectively eliminate exports below the* '*normal value*'. Alongside, we support the argument through a game theoretic exercise. Section 3 concludes the paper.

2. The Model

We argue that the threat of an optimal *ad-valorem* AD-duty would alter the pricing decision of the foreign firm. For similar arguments see, (Reitzes, 1993; Tivig and Walz, 2000). With this proposition, we take into account the sustained 'material injury' to the domestic firm and thereby calculate the optimal duty required to offset dumping.

We consider a duopoly model involving the domestic firm and a foreign firm, both producing 'like product'.[6] The technologically superior foreign firm is the *price leader*. The foreign firm (Firm 1) exports q_1 amount of output to the home country. It enjoys a cost advantage in production of q_1 and can sell in the home (export) market *below* its 'normal value'. On the other hand, Firm 2 (the domestic firm) produces q_2 amount of output and is assumed to be the single producer of the product in its home country.

In the home market, both the firms face a linear market demand function $Q = a - bp \quad a, b > 0$.[7] Suppose that the cost functions for firm 1 and 2 are:

$$c_1(q_1) = \alpha q_1 + F_1;\ \alpha > 0 \text{ and } c_2(q_2) = \frac{q_2^2}{2} + F_2$$

F_1 and F_2 denote fixed costs for firm 1 and 2, respectively. Total market output is $Q = q_1 + q_2$. The profit-maximization problem for the domestic firm (Firm 2) in autarky is:

$$\max_Q \Pi = p(Q)Q - C(Q) - F_2 = \left(\frac{a-Q}{b}\right)Q - \left(\frac{Q^2}{2}\right) - F_2$$

Hence, the domestic firm's monopoly equilibrium price-output combination will be:

$$Q^M = \left(\frac{a}{b+2}\right), \quad p^M = \frac{a(b+1)}{b(b+2)}$$

The maximum profit of the domestic firm is: $\Pi_{\text{auturky}} = \frac{a^2}{2b(b+2)} - F_2$

However, in the *post*-trade scenario, the domestic firm can no longer charge the monopoly price as it faces competition from the foreign firm. As a result, the domestic firms lobby to

[6] Identical Products that are alike in all respects or in the absence of such a product, another product which although not alike in all respects, has characteristics closely resembling those of the product under consideration. For details see, Article 2.6 of GATT (1994).

[7] In autarky, the domestic firm also faces the same market demand function. We assume that firm 2 does not face any capacity constraint.

their government authorities for protection. One such policy choice by the domestic government is AD initiation. Considering the plausible actions of both the foreign and domestic firm, we compute and compare the optimal price, output and profit conditions under each of the following strategy combinations.

Case I: Exports Below Normal Value With No AD Initiation

With trade, the domestic firm would accept the price '*p*' (as parameter) set by the foreign firm, and choose its output level.[8]

The post-trade profit maximization problem for the domestic firm can be written as:

$$\max_{q_2} \pi_2 = pq_2 - \frac{q_2^2}{2} - F_2$$

The follower (Firm 2) would choose an output level where price is equal to its marginal cost. With p as the (parametric) prevailing price in the domestic market, the foreign firm would be serving the *residual* demand.

The profit maximization problem of the foreign firm is:

$$\max_{q_1} \pi_1 = \left(\frac{a}{b+1} - \frac{q_1}{b+1} \right) q_1 - \alpha q_1 - F_1$$

The trade equilibrium price-output combinations for the two firms are:

$$q_1^* = \frac{a - \alpha(b+1)}{2}; \quad q_2^* = \frac{a + \alpha(b+1)}{2(b+1)} = p^*$$

The profit of the two concerned firms will be:

$$\pi_1^* = \frac{\{a - \alpha(b+1)\}^2}{4(b+1)} - F_1; \quad \pi_2^* = \frac{\{a + \alpha(b+1)\}^2}{8(b+1)^2} - F_2$$

In order to highlight the sustained 'material injury' and argue in favour of the AD policy we compare the *pre*-trade optimal price, output and profit level with the corresponding trade equilibrium price, output and profit values for the domestic firm. See, Table 1 in which we consider some hypothetical values for *a*, *b* and α.

[8] '*p*' being the export price which is below 'normal value'.

Table 1: Analysis of The Model Based on Hypothetical Values

Values	Autarky	Post-Trade	Material Injury
$a=100$ $b=0.1$ $\alpha=0.6$	$p_{\text{autarky}}=523.8$ $Q_{\text{autarky}}=47.61$ $\Pi_{\text{autarky}}=23809.52$	$p^*=45.75$ $q_1^*=49.67, q_2^*=45.75,$ $\pi_1^*=2242.82, \pi_2^*=1046.73$	Firm 2 suffers 3.9% and 95.6% decline in output share and profit levels, respectively.
$a=100$ $b=0.2$ $\alpha=0.4$	$p_{\text{autarky}}=272.72$ $Q_{\text{autarky}}=45.45$ $\Pi_{\text{autarky}}=11363.63$	$p^*=41.87$ $q_1^*=49.76, q_2^*=41.87,$ $\pi_1^*=2063.38, \pi_2^*=876.40$	Firm 2 suffers 7.87% and 92.28% decline in output share and profit levels, respectively.
$a=100$ $b=0.3$ $\alpha=0.4$	$p_{\text{autarky}}=188.40$ $Q_{\text{autarky}}=43.47$ $\Pi_{\text{autarky}}=7246.37$	$p^*=38.66$ $q_1^*=49.74, q_2^*=38.66,$ $\pi_1^*=1903.12, \pi_2^*=747.35$	Firm 2 suffers 11.06% and 89.68% decline in output share and profit levels, respectively.
$a=100$ $b=0.4$ $\alpha=0.8$	$p_{\text{autarky}}=145.83$ $Q_{\text{autarky}}=41.67$ $\Pi_{\text{autarky}}=5208.54$	$p^*=36.11$ $q_1^*=49.44, q_2^*=36.11,$ $\pi_1^*=1745.72, \pi_2^*=651.96$	Firm 2 suffers 13.34% and 87.48% decline in output share and profit levels, respectively.
$a=100$ $b=0.5$ $\alpha=0.5$	$p_{\text{autarky}}=120$ $Q_{\text{autarky}}=40$ $\Pi_{\text{autarky}}=4000$	$p^*=33.58$ $q_1^*=49.62, q_2^*=33.58,$ $\pi_1^*=1641.42, \pi_2^*=563.80$	Firm 2 suffers 16.05% and 85.9% decline in output share and profit levels, respectively.
$a=100$ $b=1$ $\alpha=1$	$p_{\text{autarky}}=66.67$ $Q_{\text{autarky}}=33.33$ $\Pi_{\text{autarky}}=16666.67$	$p^*=25.5$ $q_1^*=49, q_2^*=25.5,$ $\pi_1^*=1200, \pi_2^*=325.125$	Firm 2 suffers 23.49% and 80.49% decline in output share and profit levels, respectively.
$a=100$ $b=2$ $\alpha=2$	$p_{\text{autarky}}=37.5$ $Q_{\text{autarky}}=25$ $\Pi_{\text{autarky}}=625$	$p^*=17.67$ $q_1^*=47, q_2^*=17.67,$ $\pi_1^*=736.49, \pi_2^*=156.11$	Firm 2 suffers 29.32% and 75.02% decline in output share and profit levels, respectively.
$a=100$ $b=3$ $\alpha=3$	$p_{\text{autarky}}=26.67$ $Q_{\text{autarky}}=20$ $\Pi_{\text{autarky}}=333.33$	$p^*=14$ $q_1^*=44, q_2^*=14,$ $\pi_1^*=484, \pi_2^*=98$	Firm 2 suffers 30% and 70.59% decline in output share and profit levels, respectively.

Had the domestic firm, accepted the prevailing export price, it would not have been able to sustain the losses, as it can nowhere reach the price level that the foreign firm charge. We argue that an AD duty would yield the best result for the domestic firm as the magnitude of 'material injury' sustained to the domestic firm (Firm 2) varies with the elasticity of demand and it is case specific.

Also, it is found that unlike orthodox protectionist measures, the rate of an AD duty can be varied depending upon the magnitude of 'material injury'. Further, one can say from fig. 3 that beyond the profit maximizing price of firm 1 (the foreign firm), imposition of an AD duty would cause the export price to increase. This will lead to a decline in profits of foreign firm.

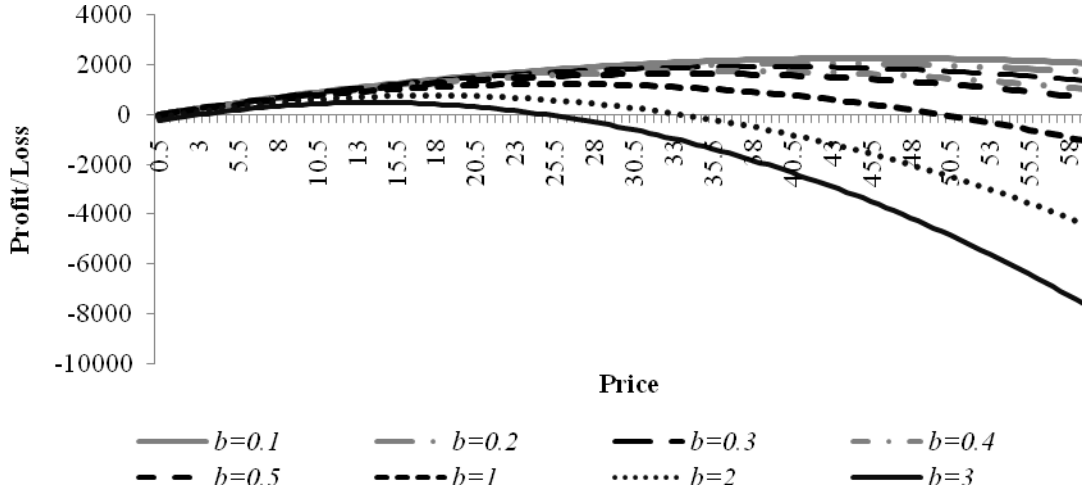

Figure 3: Profit Curves of the Foreign Firm

Case II: Exports Below Normal Value With Affirmative AD Case

We consider an *ad-valorem* anti-dumping duty on equilibrium price *below* 'normal value' $\left(p^*\right)$. Domestic firm would now accept the price $\tilde{p} = p^* + tq_1$ where $t > 0$ is the rate of AD duty. Such an AD duty will raise the export price to the level of 'normal value' and ensure *dumping margin* to be zero.[9] Accordingly, the domestic (importing) firm would choose its output level ($\tilde{q}_2$).

The profit maximization problem of the domestic firm now becomes:

$$\max_{\tilde{q}_2} \tilde{\pi}_2 = \tilde{p}\tilde{q}_2 - \frac{\tilde{q}_2^2}{2} - F_2$$

Since the foreign firm would operate in the domestic market based upon the *residual* demand, the profit maximization problem for the foreign firm would be

$$\max_{\tilde{q}_1} \tilde{\pi}_1 = \left(\frac{a}{b+1} - \frac{(bt+t+1)}{b+1}\tilde{q}_1\right)\tilde{q}_1 - \alpha\tilde{q}_1 - F_1$$

[9] Dumping margin is defined as the difference between export price and 'normal value'.

Trade equilibrium price-output combination with the AD duty prevailing in the home market for the two firms would be:

$$\tilde{q}_1^* = \frac{a-\alpha(b+1)}{2(bt+t+1)} \text{ and}$$

$$\tilde{q}_2^* = \frac{a+\alpha(b+1)}{2(b+1)} + t\left\{\frac{a-\alpha(b+1)}{2(bt+t+1)}\right\} (= \tilde{p}^*)$$

Compared to Case I, a commitment to an anti-dumping policy increases domestic output, decreases foreign exports, and increases the market price.

Case III: Exports Above Normal Value With Counterfeit AD Case

When exports are made *above* 'normal value', the prevailing price in the home market would be $\hat{p} = p^* + \mu$ and $\mu > tq_1$. As the domestic firm does not get to know *initially* whether the imports are above or below the 'normal value' before filing an AD investigation, the AD case is likely to be a counterfeit one. Under such circumstances both the firms would bear an unnecessary cost of fighting out the AD case. In order to capture such unnecessary costs, we modify the initial cost functions to the followings:

$$c_1(q_1) = \alpha q_1 + \overline{F}_1 \text{ and } c_2(q_2) = \frac{q_2^2}{2} + \overline{F}_2$$

where, $\overline{F}_i = F_i + \theta_i, i = 1,2$ and θ_i includes the monetary and non-monetary cost of an counterfeit AD case.[10]

The profit maximization problem for the domestic firm is:

$$\max_{\hat{q}_2} \hat{\pi}_2 = \hat{p}\hat{q}_2 - \frac{\hat{q}_2^2}{2} - \overline{F}_2$$

As earlier, again the follower would choose an output level where $\hat{p} = \hat{q}_2$.

The profit maximization problem of the foreign firm would be:

$$\max_{\hat{q}_1} \hat{\pi}_1 = \left(\frac{a}{b+1} - \frac{\hat{q}_1}{b+1} - \mu\right)\hat{q}_1 - \alpha\hat{q}_1 - \overline{F}_1$$

[10] Examples of non-monetary cost are loss of goodwill, frequent visits to case hearings, time cost, among others. Also known as 'harassment effect'.

Then the trade equilibrium price-output combination for the two firms would be:[11]

$$\hat{q}_1^* = \frac{a-(\mu+\alpha)(b+1)}{2} \text{ and } \hat{q}_2^* = \frac{a+(\mu+\alpha)(b+1)}{2(b+1)} (= \hat{p}^*)$$

Compared to Case I and II, *the foreign firm would not export above* '*normal value*', *as its trade equilibrium output falls*. Thus, in order to encourage exports *above* 'normal value' in the home market, the home country must have the ad-valorem duty: $t^* > \frac{\mu}{a-(\mu+\alpha)(b+1)}$.

In other words, t^* acts as a credible threat[12] for the foreign firm and restrict them only to export *above* 'normal value'. In the post-trade scenario the domestic firm enjoys a larger market share when the prevailing price in the home market (i.e., export price) is *above* the 'normal value'. Thus, we have $\hat{q}_2^* > \tilde{q}_2^* > q_2^*$.

On the contrary, when exports are made *below* the 'normal value', the domestic firm enjoys an increment in profit with an *ad valorem* AD duty levied. Given the non-monetary cost associated with a counterfeit AD case, the domestic firm would not like to engage itself in such a situation. Nonetheless, when the foreign firm exports *above* 'normal value', and there is no counterfeit AD case filed by the domestic firm, both firms(s) enjoy a higher profit share.

In order to substantiate the general validity of the model, we perform the entire exercise with different cost specifications, such as:

$$c_1(q_1) = \lambda q_1^2 + \gamma q_1 + F_1; \lambda, \gamma > 0 \text{ and}$$
$$c_2(q_2) = \rho q_2^2 + \sigma q_2 + F_2; \rho, \sigma > 0$$

With these new cost functions, the results do not change qualitatively. However, the new optimal *ad-valorem* AD duty is: $t_{\text{new}}^* > \frac{\mu[1+\lambda(b+1)]}{[a-(b+1)(\mu+\gamma)]}$.

[11] When exports are made *above* 'normal value' and there is no counterfeit AD case, the trade equilibrium price-output combinations for the foreign as well as the domestic firm will be similar to that of $\hat{q}_1^*$ and $\hat{q}_2^*$, respectively. However, the profit function for the two firms would not consider the monetary and non-monetary cost of a counterfeit AD case. In other words, profit of the two firms would be larger than what these respective firms earn (i.e. profit) in Case III.

[12] t^* would ensure, foreign firm's output in Case II to be *less* than that in Case III.

Thus, a credible threat of an AD duty can potentially alter the pricing strategy of the exporting firm from '*below*' *to* '*above*' *normal value and create a win-win situation for both the firms*.

2.1 Game Theoretic Exercise

We continue with the assumption that the foreign firm has technological superiority (and therefore, cost advantage) in producing the 'like product'. As a result, the foreign firm has a choice to sell *below* the 'normal value'.[13] In retaliation, the domestic (importing) firm can either initiate an anti-dumping investigation or can opt to set its price as that of leader.

When the foreign firm exports *below* the 'normal value', it enjoys a higher pay-off given the domestic firm does not retaliate but simply opt to set the same price as that of exporter. However, the domestic firm would not prefer to set such a price as it would be extremely difficult to reduce its selling price anywhere close to it. There is a good reason to believe that the foreign firm would have to compromise with a relatively lower pay-off when the domestic firm selects the strategy of initiating an AD case. Under such a circumstance, it is highly probable that an AD initiation by the domestic firm would get converted into an AD measure. Moreover, as the foreign (exporting) firm sells *below* the 'normal value' it may have to sustain short term losses apart from incurring a significant cost of fighting out the AD case.

On the other hand, when the foreign firm decides to sell *above* the 'normal value', the domestic firm has a higher likelihood to set its price somewhere close to the price charged by the foreign firm (leader). The domestic firm knows that not only there is a high cost of being engaged in an counterfeit AD case; also the domestic firm can now better compete with the price charged by the foreign firm.[14] In other words, when the exporting firm decides to sell *above* the 'normal value', it would be wise for the import competing domestic firm to set its price around the price charged by the exporting firm over an AD initiation. Given the common knowledge and costs associated with AD investigation for both the players, it is rational for the exporting firm to sell *above* the 'normal value'.

[13] The underlying assumption here is that exports made *below* the normal value causes 'material injury' to the domestic firm(s).
[14] Such a high cost prompts the domestic firm not to suffer from *moral hazard* problem.

We consider a *sequential form* game. The foreign firm makes the choice first and then the domestic firm retaliates. As the domestic (importing) firm does not get to realize initially whether the imports are *above* or *below* the 'normal value' before filing an AD investigation, we therefore, assign a *singleton information set* containing two decision nodes for the domestic firm.

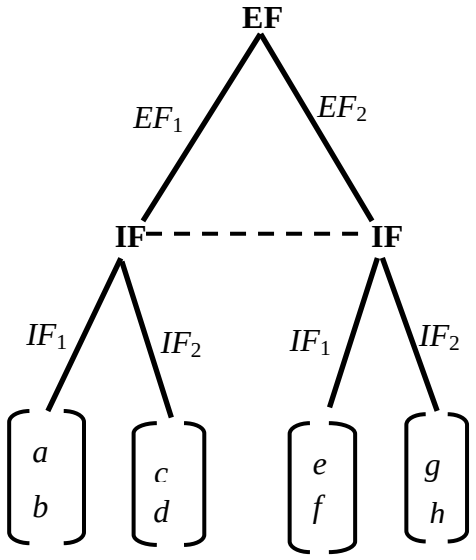

Figure 3: Extensive Form Game

where EF_1: *Price below Normal Value;* EF_2: *Price above Normal Value;* and
IF_1: *Initiate AD;* IF_2: *Accept Leader's Price.*

We impose the following restrictions on the pay-offs:

Exporting firm: $a < c$ and $e < g$

Importing firm: $b > d$ and $f < h$

When the exports are made *below* the 'normal value' and subsequently the domestic (importing) firm initiates an AD procedure (IF_1), the foreign (exporting) firm would earn a lower profit than what it would earn if the domestic firm accepts the price set by the foreign firm (IF_2); i.e., $a < c$. This is because the foreign firm has high probability to face an AD measure (which may be very costly) when selling below the 'normal value'. On the same note, an AD initiation by the domestic (importing) firm would yield it a higher pay-off (i.e., $b > d$) as there is a high probability of recovering the sustained 'material injury' through the AD measure.

When the foreign (exporting) firm sells *above* the 'normal value' (EF_2), an AD initiation by the importing firm would yield a lower pay-off for both the firms (i.e., $e < g$ and $f < h$). Despite selling above the 'normal value' if the domestic (importing) firm initiates an anti-dumping case against its foreign counterpart, it will not only involve monetary cost of fighting out the AD case but also a significant time cost as well as the opportunity cost of loosing that particular export market till the case is resolved. Moreover, the foreign firm will be relatively better off if the domestic firm decides to operate upon the price set by the foreign (exporting) firm. Further one can say that given the optimal rate of AD duty, the foreign firm would like to export *above* 'normal value'. When the exports are made *above* the 'normal value', the domestic firm would prefer to accept the prevailing price than to initiate an AD case.[15] Filing a counterfeit AD case would imply unnecessary cost to the domestic (importing) firm. Also, the domestic firm can now compete with prevailing export price.

When the foreign firm decides to sell *below* the 'normal value', it earns a lesser pay-off compared to what it would earn if it sold *above* the 'normal value' (i.e., $a < e$). This is because of the possible retaliation by the domestic firm in terms of initiating an AD case against the foreign firm and therefore, imposing an AD duty on exports. As an illustration we represent the restrictions on the basis of some hypothetical values in fig. 4.

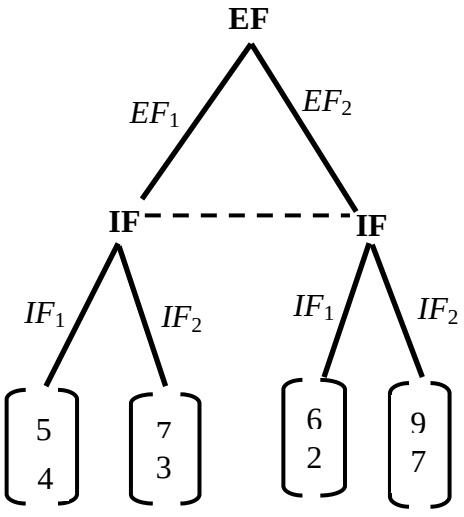

Figure 4: The Pay-off Structure of Domestic and Foreign Firm

[15] We assume here that exports *above* normal value do *not* necessarily cause any 'material injury' to the domestic firm.

When the exports are made *below* the 'normal value' (EF_1), then it is more paying for the domestic firm to initiate AD (IF_1) as the pay-off is higher. On the other hand, when exports are made *above* the 'normal value' (EF_2), the domestic firm would accept the prevailing price (IF_2) as the pay-off is relatively higher. Therefore, the strategy combination (EF_2- IF_2) is the *unique* Nash equilibrium.

No matter what the domestic firm plays, selling *above* the 'normal value' is clearly a preferred strategy for the foreign firm. As a result, the exporting firm would *not* sell *below* the 'normal value' and the importing firm would find IF_2 to be its dominant strategy. Thus, the credible threat of an anti-dumping enforcement alters the strategy choice of the exporting firm and allows for the conduct of free and fair trade

3. Summing Up

How would a domestic (importing) firm respond to the case of dumping? We analyzed the magnitude of sustained 'material injury' and a possible retaliation strategy by the firm(s) in terms of a price-leadership model. The level of AD duty varies with 'material injury' and ensures export price to rise. A strategically chosen AD duty by the government of an importing country over the profit-maximizing price of the foreign (exporting) firm will decrease its profit.

The domestic firm faces a trade-off in choosing alternative strategies (i.e., anti-dumping initiations vis-à-vis a price war). The (credible) threat of the *ad-valorem* anti-dumping duty avoids exports *below* 'normal value' by the foreign firm. An anti-dumping duty acts as an *ex-ante* threat to the exporters and thus changes the equilibrium outcome. The threat of an anti-dumping enforcement might not be a permanent one but it would manage to alter the original intentions of the exporting firm (i.e. predatory pricing).

For instance, data on AD initiations reveal that around 62% of AD initiations get converted to AD measures for the *new* users. It may be argued that owing to a high success rate, unfair trade practices pertaining to selling below the 'normal value' have been reduced and thus a decline in AD activities in recent times. Nonetheless, we still find that anti-dumping initiations are used much more than any other protectionist measures in lieu of declining

orthodox trade protectionist measures (e.g., tariff barrier or a binding constraint of import quota).

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