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'TWIN CASES'

Cartels and European Antidumping Policy

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Abstract

Messerlin (1990) provides empirical evidence of European Antidumping cases which are 'twinned' to Antitrust cases. In this paper we model the effects of European Antidumping policy with injury margin calculation on the basis of price-undercutting, on a Foreign exporter and a European cartel under the assumption of a policymaker which is concerned with European welfare. We use the framework of Sutton (1992) to derive results which hold both under homogeneous Bertrand and homogeneous Cournot competition. The model suggests that a rational policymaker will always prefer an Antidumping Duty over a price-Undertaking in case of an Antidumping complaint. It will be shown that the threat of an Antidumping Duty is sufficient to withhold the Foreign firm from predation and that the European cartel does not survive the Foreign competition. However the evidence presented by Messerlin (1990) suggest that in a large number of cases price-Undertakings are observed. The model in this paper allows us to strongly discourage the use of price-Undertakings because they induce predatory action by the Foreign firm and result in an international cartel in the long run.

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1. Introduction

At the European Commission, Antidumping matters are the responsibility of DG I¹ while competition issues are dealt with by DG IV. Stegemann (1989), Messerlin (1990) and others have expressed their concern over the division between investigations of 'injurious dumping' and of 'market structure'. In their view Antidumping policy should be made subordinate to competition policy for the following reasons. The first reason is that from an economic point of view predatory dumping is the only rationale for taking Antidumping measures. Predation can only be profitable in concentrated industries with substantial entry barriers. A second reason has recently been put forward by Messerlin (1990), who suggests that Antidumping action may be part of the strategy of European cartels to force Foreign exporters to the EU, to join the cartel. Messerlin (1990) provides evidence of Antidumping cases which are 'twinned' to Antitrust cases. European firms which ask for Antidumping protection in DG I at a certain moment in time were fined under the Antitrust provisions in DG IV² later on.

In this paper we model the effects of European Antidumping policy on a Foreign exporter and a European cartel under the assumption of a rational policymaker. For this purpose we use a Home country and a Foreign country. In the absence of trade the monopoly price rules in both markets which are identical in size and taste. The Home monopoly before Foreign entry is a Home cartel where the members in the cartel jointly maximise their profits through price-collusion³. In what follows we will present the cartel by one Home firm. The existence of a pre-entry cartel is an indication that the Home firm prefers *cooperation* to non-cooperation. After trade opens up, the Foreign firm can

¹ Directorate-Generale

² Messerlin (1990) only looked at cases in the chemical sector but suggests that other 'twin studies' are most likely to be found in consumer electronics and ball bearings.

³ Suppose for instance that the Home monopoly consists of two firms whose actions are perfectly coordinated.

export towards the Home market in an *aggressive* way or in a *non-aggressive* way. Aggressive entry refers to predation, whereas non-aggressive entry refers to competition in a non-cooperative way meaning Bertrand or Cournot competition. In this paper we model varying price-competition by both looking at homogeneous Bertrand and homogeneous Cournot competition. This framework is the one of Sutton (1992). Homogeneous Bertrand is used to model the limit of strong price competition. Homogeneous Cournot is used to model weak price competition. A result which occurs in both these extreme types of competition can be shown to hold for any level of price competition which lies in between these two extremes. The analysis will be carried out under symmetric marginal costs⁴.

An Antidumping investigation in the European Union involves the calculation of a *dumping* and an *injury margin* by the Antidumping Committee of the European Commission. The *dumping margin* is usually calculated as a positive price difference between the Foreign and the European market for the same product. The *injury margin* calculation is confidential. Several authors (Tharakan, 1993; Vermulst and Waer, 1990) have pointed out that the most preferred method of the Antidumping Committee for the determination of the injury margin in Antidumping Duty cases seems to be the level of *price-undercutting* and *price-underselling*. *Price-Undercutting* refers to the price difference between the European product and the Foreign 'like' product sold in the EU whereas *price-underselling* refers to the price difference between European *target prices* and the price of the Foreign 'like' product sold in the EU. A *target price* is often constructed when there is no positive price difference between European products and Foreign imports. A target price is constructed with the European cost of production added with a 'reasonable' profit margin for the industry involved which is usually the profit margin which was being earned prior to Foreign dumping. The Antidumping legislation does not in any instance refer to market structure. The legislation therefore is not well suited to discriminate between injury which is the result of normal competition and injury which will lead to the exit of the European firms. This situation makes it possible for European firms who price-collude before the Foreign entry and who see their profits reduced due to Foreign

⁴ In the case of asymmetric marginal costs where the Foreign firm has lower costs, the Foreign firm could drive out the Home firm without making use of its long purse but simply by pricing at marginal cost.

competition to turn to the Commission in order to get protection. Nevertheless a number of quotes from EU officials (see Vandebussche 1991), clearly indicate that the goals set out to achieve by the Antidumping legislation are to prevent European firms being driven out of business and to safeguard competition and welfare in the European market.

In both cases the Home firm can file a complaint to the Antidumping Committee. The Committee conducts the Antidumping investigation⁵ and writes a report for the Council of ministers where one out of three possible actions has to be decided upon : 'No measures', an 'Antidumping Duty' or a 'Price-Undertaking'.

By law an *Antidumping duty* has to eliminate the injury margin or the dumping margin, whichever is lower. This is called the 'lesser duty' rule.

No information is available on injury margin calculation in the Undertakings cases. For analytical purposes we feel it is not unreasonable to assume that for the determination of injury margins, the Commission makes use of the same rules of thumb as in the duty cases. In this paper we assume that the Council of ministers wants to take an action which maximizes the unweighted Community welfare which consists of European producer surplus, European consumer surplus and government revenue in case of an Antidumping duty.

In what follows we will show how the Home cartel is affected by the presence of the Antidumping legislation and implementation in the EU in an industry where predatory action can be worthwhile. The plan of the paper is as follows. In section 2 we discuss the general set up of the game. In section 3 we look at Bertrand competition under symmetric costs while in section 4 we discuss the results under Cournot competition. In section 5 we compare the empirical findings of Messerlin (1990) with the results we derived in the oligopoly model. Section 6 concludes.

⁵ The Antidumping Committee consists of bureaucrats who's task consists in determining whether or not the Home industry has suffered injury. Empirical evidence has shown that they do not investigate the market structure in the Home market and that they use rule of thumbs for the injury margin calculation. The actual decision of protection is taken by the Council of ministers on the basis of the evidence presented by the Antidumping Committee. Even if decision makers act in the interest of the community, bureaucrats need not to.

2. Players, Actions and Strategies

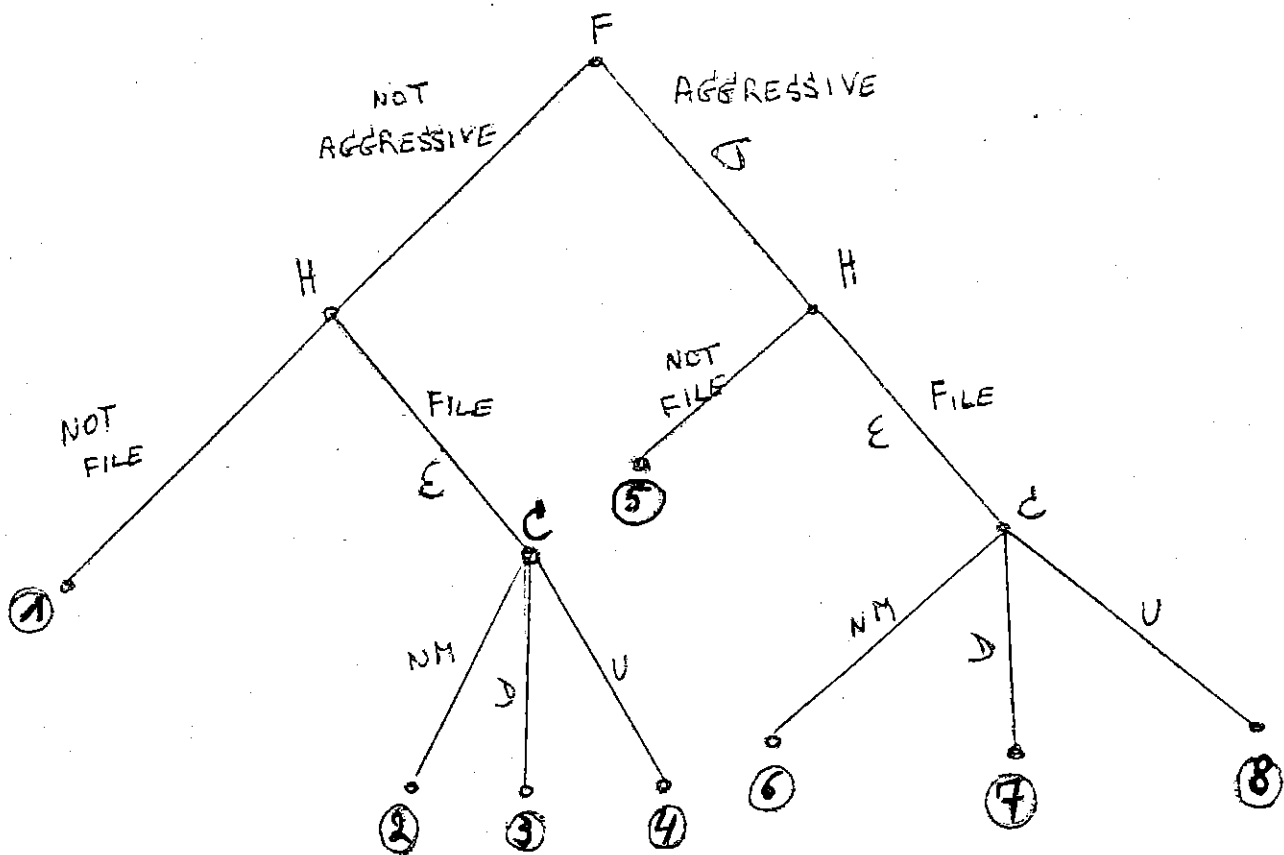
In this section we describe the basic set up of the game and the players' actions and strategies⁶. Dumping is inherent to the set up of the game because of the asymmetry between the Home and the Foreign country. After the Foreign firm enters the Home market, competition between the two firms in the Home market will always result in lower prices than in the Foreign country where there is no competition. With respect to the injury margin we only consider cases where the injury margin and the level of the duty is determined on the basis of price-undercutting which is believed to be the Council's most preferred method in the duty cases (Vandenbussche, 1992).

The sequence of the game tree is illustrated in graph 1. It starts off with a Foreign firm which can enter the Home market in an aggressive (right) or a non-aggressive way (left). *Aggressive entry* means that the Foreign firm is willing to use its profits in the Foreign market to cover temporary losses which result from predatory action in the Home market. These temporary losses incurred by the Foreign firm in order to drive the Home firm out of the market, can be thought of as a cost which we represent by σ . *Non-aggressive entry* implies that the Foreign firm considers both markets as separate entities and is not willing to use its long purse to cover losses in the Home market. Whatever the Foreign firm decides, the Home firm has the option of *filing* or *not filing* a complaint to the Commission after Foreign entry. In case the Home firm decides to file, there are legal expenses for both firms presented by ϵ ⁷. Once the case arrives at the Council three things can be decided upon: 'no measures', a 'Duty' or an 'Undertaking'.

⁶ A more general approach is developed in Vandenbussche and Walsh (1994)

⁷ The legal expenses in Antidumping cases are the same for both firms and they are very considerable. They do not only represent the expensive lawyer bills, but also the opportunity cost of resources which have to be made available within the firms to follow up the Antidumping investigation which on average lasts one year. Therefore the legal expenses are sufficiently important to be taken on as a strategic variable in the analysis.

Graph 1: General set up of the Antidumping game



The three players: the Foreign firm (F), the Home firm (H) and the Policymaker (C) have the following action sets :

Actions Foreign firm = { Non-Aggressive Entry (NAE), Aggressive Entry (AE) }

Actions Home firm = { File (F), Not File (NF) }

Actions Council = { No measures (NM), Duty (D), Price-Undertaking (U) }

In any game a player's *strategy* is a complete plan of action which specifies an action for the player in every contingency of the game the player might be called upon to act (Gibbons 1992).

From the action sets above and from the game tree we can derive all the possible strategies of the three players in this game:

It will be shown that a rational policymaker always prefers a Duty¹⁰ to an Undertaking while the Foreign firm is always better off under an Undertaking than under a Duty

3. Bertrand Price-competition and symmetric marginal costs

In this section we analyze the model under the assumption of homogeneous Bertrand competition. Homogeneous Bertrand competition is the most extreme case of tough price-competition and will be used as a modeling building block (Sutton, 1991).

Under Bertrand competition the strategic variable is price and the objective is to find a Nash equilibrium in prices. Bertrand competition leads to the demand for output for firm i in the Home market:

$$\begin{aligned}
 (1)' \quad Q^i(p^i, p^j) &= a - p^i && \Leftrightarrow p^i < p^j \\
 &= 0 && \Leftrightarrow p^i > p^j \\
 &= (a - p^i)/2 && \Leftrightarrow p^i = p^j
 \end{aligned}$$

Superscript $i = H, F$ and $j = F, H$ but $i \neq j$ where H and F represent the Home and the Foreign firm respectively. The size of the Home market is represented by a .

The demand functions imply that the firm with the lowest price serves the entire market.

The firm with the highest price sells nothing. We assume that the firm for who not selling anything becomes a permanent position will leave the market which gives monopoly power to the other firm because entry barriers prevent re-entry.

In case of equal prices the market is split into two equal parts. Both firms' profit functions are given by:

¹⁰ In principle the Foreign firm can get the duty revenue back. However it can last up to 10 years before the Home country actually pays the duty revenue. The sunset clause stipulates that Antidumping duties lapse after 5 years unless a new complaint is filed. Case evidence has shown that after that it can last another 5 years before the Foreign firm receives the duty revenue paid. Whatever the exact length of this period we will assume that it is long enough to allow the Home country to invest the duty revenue in a profitable way.

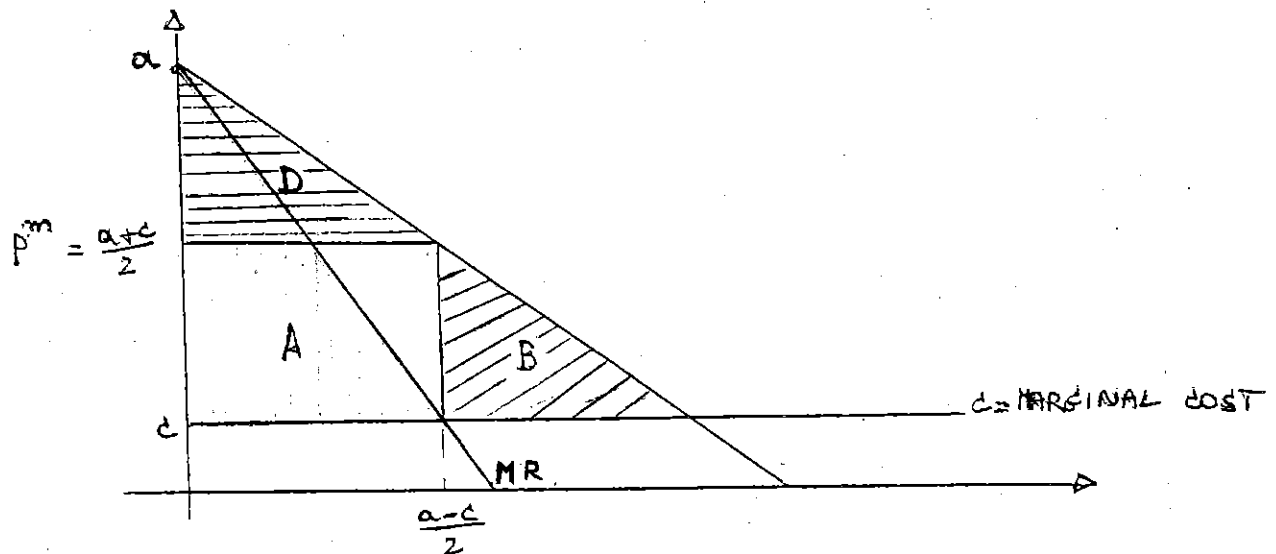
$$(2) \quad \Pi^i = Q(p^i, p^j) * (p^i - c^i)$$

where c^j present marginal cost of the Foreign firm and the Home firm respectively. It can be shown that in case of symmetric marginal cost ($c^F = c^H = c$), the prices in the Bertrand Nash equilibrium equal marginal cost, leaving both firms with zero (Bertrand) profits:

$$(3) \quad p^i = p^j = c$$

We assume that the prior to Foreign entry the non-cooperative Nash equilibrium is not played because the firms in the Home cartel prefer to cooperate and price collude. The initial situation is one where the Home price prior to Foreign entry is the monopoly price p^m . This is given in graph 2

Graph 2: Initial situation in the Home country prior to Foreign entry



- where D = Home consumers' surplus under monopoly
- A = Home firm's profit prior to Foreign entry
- W = Total Home welfare
- = $D + A$
- B = unused surplus under Home monopoly

In the initial situation, the Home firm has monopoly profits and Home consumers have minimal consumer surplus. We will look at the payoff in the Home market for each player (F, H and C) in each of the eight final nodes in the game tree in graph 3 compared to the initial situation prior to entry. Table 1 gives the players' new payoffs in each of the nodes of the three stage game (PS^F , PS^H , W^H) while table 2 gives the change in welfare for each player compared to the initial situation (ΔPS^F , ΔPS^H , ΔW^H) whereby the (change in) total Home Welfare is given by $(\Delta)W^H$ which is the sum of the (change in) Home firm's surplus (ΔPS^H) and the (change in) Home consumers' welfare (ΔCS^H). In case of an Antidumping duty the Government Revenue in the Home country (GR^H)¹¹ is also included in Home welfare.

We will first describe the payoffs in the first four nodes on the left hand side of the tree and than look for the subgame perfect Nash equilibrium path starting in the last subgame. We do the same thing for the right hand side of the tree in order to compare the Foreign firm's payoffs in the two actions (NAE,AE) he can choose between. The action which renders the highest payoff will be the subgame perfect equilibrium of the entire game.

Going left in the tree in graph 3 implies that the Foreign firm enters the Home market in a *non-aggressive*¹² way. When the Home firm does *not file* a complaint the 'normal' non-cooperative Bertrand game is played and we end up in node 1. In this node the Home market goes from a monopoly situation to an allocationally efficient outcome. Both firms have zero (Bertrand) profits which we present by H^B and F^B for the Home firm and the Foreign firm respectively to indicate the difference with a situation in which one of the firms is not selling anything which is indicated with a payoff of zero. Home consumers now have maximal welfare ($D+A+B$). Compared to the initial situation in graph 2, Home producers (ΔPS^H) loose A, while Home consumers (ΔCS^H) gain A + B. Total Home welfare (ΔW^H) increases by B.

¹¹ We do not make any assumption on how this government revenue is distributed in the Home country. A mere addition of Government Revenue to Consumer and Producer surplus in the Home country gives an indication of Home welfare.

¹² Non-aggressive entry by the Foreign firm means that the Foreign firm does not make use of its long purse but sees the Home and the Foreign market as separate entities. This implies that the Foreign firm will prefer to exit the Home market if necessary rather than to use its long purse in the Foreign market to make up for losses in the Home market.

Graph 3: Bertrand competition and symmetric costs

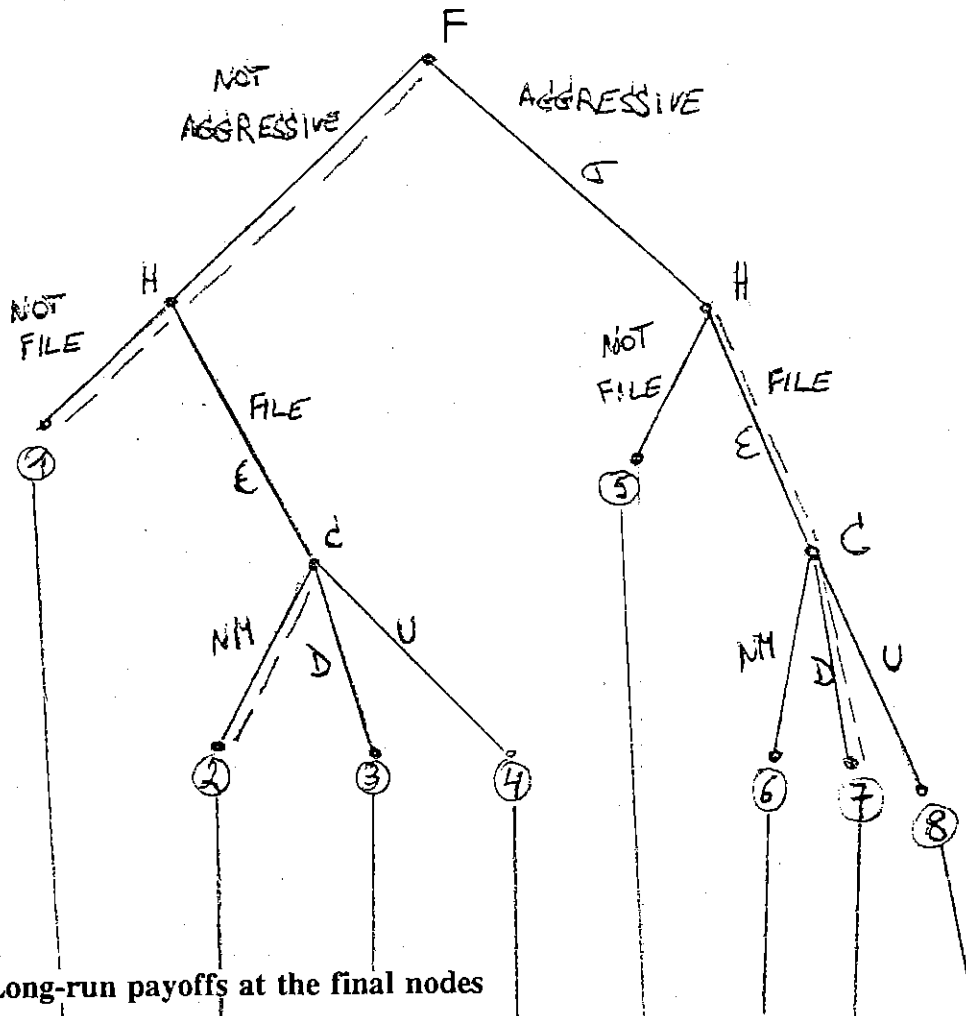


Table 1: Long-run payoffs at the final nodes

Long-run Payoffs	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
PS ^F	F ^B	F ^B - ε	exit (-ε)	A/2 - ε	A - σ	A - σ - ε	F ^B - σ - ε	A/2 - σ - ε
PS ^H (I)	H ^B	H ^B - ε	A - ε	A/2 - ε	exit	exit(-ε)	A/2 - ε	A/2 - ε
CS ^H (II)	D + A + B	D + A + B	D	D	D	D	D	D
GR ^H (III)	0	0	0	0	0	0	A/2	0
W (I + II + III)	D + A + B	D + A + B - ε	D + A - ε	D + A/2 - ε	D	D - ε	D + A - ε	D + A/2 - ε

$A = (a-c)^2/4; D = (a-c)^2/8; B = (a-c)^2/8$

Table 2: Welfare changes under Bertrand competition compared to the initial situation

Welfare Changes	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
PS ^F		F ^B - ε	- ε	A/2 - ε	A - σ	A - σ - ε	F ^B - σ - ε	A/2 - σ - ε
ΔPS ^H (I)	-A	-A - ε	- ε	-A/2 - ε	-A	-A - ε	-A/2 - ε	-A/2 - ε
ΔCS ^H (II)	+A+B	+A+B						
GR ^H (III)							A/2	
ΔW (I + II + III)	+B	+B - ε	-ε	-A/2 - ε	-A	-A - ε	-ε	-A/2 - ε

* empty cells in table 2 means that 'no changes' have taken place compared to the initial situation

We continue on the left hand side of the tree, looking at the payoffs when the Home firm decides to *file* to the Commission. One of three actions will be chosen.

If the Council of ministers decides to take '*No Measures*' we end up in node 2. The change in welfare for the players involved will be the same as in node 1 but for each player the legal expenses (ε) involved in an Antidumping investigation reduce their payoffs.

Acceptance of the complaint is possible because the Antidumping committee, in charge of the injury investigation in the European Commission, does not discriminate well between injury suffered as a result of competition or injury which will lead to the exit of the Home firm.

In the event of an *Antidumping duty* (ADT) we arrive at node 3. Both the dumping and the injury margin calculation result in the difference between the Home price prior to entry (p^m) and the price after Foreign entry which is the Bertrand Nash equilibrium price (c). The Antidumping duty is set equal to this price difference :

$$(4) \quad ADT = p^m - c$$

After the installation of the Antidumping duty on Foreign imports, the Foreign firm has to charge the monopoly price in order not to make a loss. This is illustrated in table 3. Let us start in the top left cell where both firms charge the monopoly price in the market which results in half the monopoly profits for the Home firm ($A/2$) and zero (Bertrand) profits for the Foreign firm (F^B) after the duty. However the Home firm can get a higher payoff by undercutting the Foreign firm by a fraction δ which yields $(A-\delta^2)$. If the Foreign firm continues to charge a price which consists of its marginal cost + ADT after the undercutting by the Home firm it will sell nothing and have zero profit. If the Foreign firm decides to follow the price set by the Home firm it will incur a loss. Given that the Foreign firm in case of a non-aggressive entry is not willing to use its long-purse, not selling anything will be preferred over incurring a loss in the Home market. Earlier we stated that a permanent not selling position will lead to the exit of the Foreign firm. After the exit of the Foreign firm entry barriers prevent it from re-entry in which case the Home cartel in the Home market is restored and makes a profit of A . This is the only scenario where neither of both firms wants to deviate which makes this the long-run equilibrium. The reason why the Home firm avoided price-wars and price-undercutting before the Foreign entry is because this would have led to a 'no-win' situation for the members of the cartel¹³. However even a cooperative player will want to deviate if that leads to a 'win' situation. By charging a fraction below the monopoly price the Home firm can drive out the Foreign firm and put the Home cartel back in place.

Table 3: The effect of an Antidumping duty after non-aggressive entry of the Foreign firm

Home Firm \ Foreign Firm	$p^m = c + ADT$	$p^m - \delta$	exit
p^m	$(A/2, F^B)$	$(0, \text{loss})$	(A, exit)
$p^m - \delta$	$(A - \delta^2, 0)$	$(A/2 - \delta^2/2, \text{loss})$	$(A - \delta^2, \text{exit})$

where $A = (a-c)^2/4$

¹³We stated at the beginning that the cartel can be thought of as two identical Home firms whose actions are perfectly coordinated. The non-cooperative solution if the two Home firms had played Bertrand was zero profits for both which is a 'no win' situation. By cooperation in a cartel both firms win by reaping half the monopoly profits.

Should the Commission decide on an *Undertaking* the payoffs are the ones given in node 4. Article 10 2 b) of EC antidumping regulation 2423/88 stipulates that '*prices should be reviewed by the Foreign firm in order to eliminate the injurious effects of dumping*'. Given that we measure the injury margin by means of price-undercutting, an undertaking implies that the Foreign firm agrees to align its price to the level of the Home firm's price. It is clear that an undertaking can only achieve its goal if the Commission can monitor the prices perfectly and can penalize the Foreign firm in a way which makes price-undercutting after the undertaking unprofitable. Article 13 4 b iii) of the legislation stipulates that when an undertaking is violated, the Council can install Antidumping duties¹⁴. The legislation does not stipulate how, in the event of the violation of undertakings, the level of the duty has to be determined. We assume that when violation of the price-agreement is observed the duty is given by (4)¹⁵. A duty is less favorable for the Foreign firm, therefore the Foreign firm has every incentive to follow any price set by the Home firm. We illustrate this on the basis of the table.4. We let firm H and firm F choose between three different prices: p^m , the monopoly price, $p^m - \delta$, a price which lies a fraction below the monopoly price, $p^m - 2\delta$, a price which lies two fractions below the monopoly price and p^B , the Bertrand price. We assume that when the Foreign firm charges a price below the Home firm's, the Antidumping duty given in (4) is installed immediately. The payoffs of each of the combinations are given between brackets.

¹⁴ Article 7 of the Gatt Antidumping code on Price-undertakings stipulates that: in case of violation of undertakings, the authorities of the importing country may take antidumping duties in a retroactive way on imports entered since the beginning of the violation of the undertaking.

¹⁵ The assumption of a fixed duty is a reasonable but not a necessary one. It is clear that the legislator has included the possibility of a duty to prevent the Foreign firm from deviating from the Undertaking. Any duty level which can achieve this will do.

Table 4 : Analysis of payoffs after an Undertaking where in case of violation an Antidumping duty is installed (ADT = $p^m - c$)

F	p^m	$p^m - \delta$	$p^m - 2\delta$	...	$p^B = c$
H					
p^m	(A/2, A/2)	(0, $-\delta(a-c+2\delta)/2$)	(0, $-2\delta(a-c+4\delta)/2$)	...	(0, -2A)
$p^m - \delta$	(A- δ^2 , 0)	(A/2- $\delta^2/2$, A/2- $\delta^2/2$)	(0, $-2\delta(a-c+4\delta)/2$)	...	(0, -2A)
$p^m - 2\delta$	(A-4 δ^2 , 0)	(A-4 δ^2 , 0)	(A/2-2 δ^2 , A/2-2 δ^2)	...	(0, -2A)
...
$p^B=c$	(H ^B , 0)	(H ^B , 0)	(H ^B , 0)	...	(H ^B , F ^B)

with $p^m = (a + c)/2$; $p^m - \delta = (a + c)/2 - \delta$; $A=(a-c)^2/4$; $H^B = F^B=0$

From table 4 it becomes clear that whatever the price level chosen by the Home firm, the Foreign firm's optimal reply is to set the same price as the Home firm which results in equal payoffs for both firms. This can be seen from the payoffs on the top-left, bottom right diagonal in table 4. In all the cells to the right of this diagonal the Foreign firm breaches the undertaking by setting a lower price than the Home firm. This leads to the installation of an Antidumping duty as given in (4) and results in losses for the Foreign firm. In the cells to the left of the diagonal in table 4, the price of the Home firm is lower than the price set by the Foreign firm which means that the Home firm serves the entire Home market while the Foreign firm does not sell anything.

The Home firm's payoff is always higher in the cell just below the diagonal cell which means that the Home firm always has an incentive to undercut the Foreign firm by a fraction δ . Let us look at the top left cell in the table which gives both firms' payoffs when they set a price equal to the monopoly price. The Foreign firm has no incentive to set a different price, but the Home firm can do better by charging a price which lies a fraction δ below the monopoly price. The Home firm can then serve the whole market and the Foreign firm sells nothing. The only Nash equilibrium in this game is the

Bertrand outcome¹⁶ in the bottom right cell.

However we know that previous to Foreign entry the Home firm preferred cooperation to non-cooperation because it belonged to a Home cartel. After Foreign entry and the installation of an Undertaking the Home firm knows that non-cooperation will bring both firms to the Bertrand outcome which is a 'no win' situation because it results in zero profits for both. Therefore the Home firm will turn to cooperative behaviour because this will result in the monopoly price, giving the Home firm the highest payoff possible ($A/2 = (a-c)^2 / 8$). From table 4 we know that, in contrast to the situation in node (1), the incentive for the Foreign firm to undercut the Home firm is now removed by the Undertaking and the Foreign firm will therefore follow the monopoly price which results in the same profits ($A/2 = (a-c)^2 / 8$) as the Home firm. The undertaking in fact turns the Foreign firm into a cooperative player so that a cooperative outcome can be reached and the cartel is in fact restored. The players' payoffs are given in table 1 at node 4. Both firms will share the market and each firm will have half the monopoly profits¹⁷. Compared to the initial situation in the Home market, the Home firm loses half its profits to the Foreign firm. The welfare of the Home consumers is still the minimal level D.

When looking for the subgame perfect equilibrium path on the left hand side we start by analyzing the game in the last subgame which is in stage 3 at the node where the policymaker has to decide on an action. We assume that the policymaker presented by player C is rational and will want to choose the action which maximizes Home welfare (W^H). (see table 1):

node 2	node 3	node 4
'No Measures'	'Duty' ($ADT = p^m - c$)	'Undertaking'
$W = D + A + B - \epsilon$	$W = D + A - \epsilon$	$W = D + A/2 - \epsilon$

¹⁶ The Undertaking in fact turns the 'normal' Bertrand game where both firms have an incentive to undercut the other into a modified version where now only the Home firm has an incentive to undercut and the Foreign firm has an incentive to follow any price set by the Home firm.

¹⁷ The difference with an Antidumping duty is that the government revenue in the duty case now goes to the Foreign exporter.

Given that the Council of ministers wants to maximise Home welfare 'no measures' will be taken after a complaint is filed. The Home firm will now compare its payoff before and after filing and will prefer not to file in order not to incur the legal expenses.

$$(5) \quad H^B > H^B - \epsilon$$

This suggests that *if* the Foreign firm decides to go left, it is facing a profit F^B . This will be compared with the profit the Foreign firm gets by going right.

Going right in graph 3 means *aggressive* entry in the Home market. Aggressive entry refers to *predation* which is *pricing behaviour by the Foreign firm with the intention of driving out the rival Home firm in order to charge the monopoly price afterwards*. The Foreign firm no longer considers the Home and the Foreign market separately but is willing to use its profits in the Foreign market to finance losses in the Home market. When the Foreign firm sets a price in the Home market $c-\delta$, the Home firm will not sell anything because selling below marginal cost leads to a loss. The Foreign firm can use its long purse to finance the loss. Given that the Home and the Foreign market are identical (apart from the nature of the firm operating in the market), we can calculate the extent of the long purse which is the profit of the Foreign firm in the foreign market ($\Pi^{*F} = A$) :

$$(6) \quad \begin{aligned} \Pi^{*F} &= p^m \cdot q^m - c \cdot q^m \\ &= [(a-c)/2]^2 = A \end{aligned}$$

We assume that the Foreign firm is willing to incur losses in the Home market as long as the losses do not exceed the long purse profit given by (6).

The Home firm does not have a long-purse and will therefore be forced to leave the market. At that stage, the Foreign firm can pull up the price in the Home market to monopoly level and make monopoly profits A , leaving Home consumers with minimal welfare D . These are the payoffs given in table 1 at node 5. We assume that the entry barriers in the industry are sufficiently high to allow for a monopoly to survive long enough to make predation worthwhile. From an economic point of view complaining to the Commission is now justified. Again the Council can choose between three actions.

No Measures (node 6 in the tree in graph 3) will most definitely drive the Home firm out, leaving the Home market monopolized with a profit of A for the Foreign firm. Consumers have minimal surplus D in this scenario.

The injury margin (IM) is calculated as the difference between the monopoly price which ruled in the Home market prior to entry and the price at which the Foreign firm entered the Home market which was at a fraction below marginal cost. The dumping margin however, which is the monopoly price minus marginal cost, is smaller. The lesser-duty rule stipulates that the Antidumping duty (ADT) should be set equal to the smallest of dumping margin and injury margin which in this case gives :

$$(8) \quad ADT = p^m - c$$

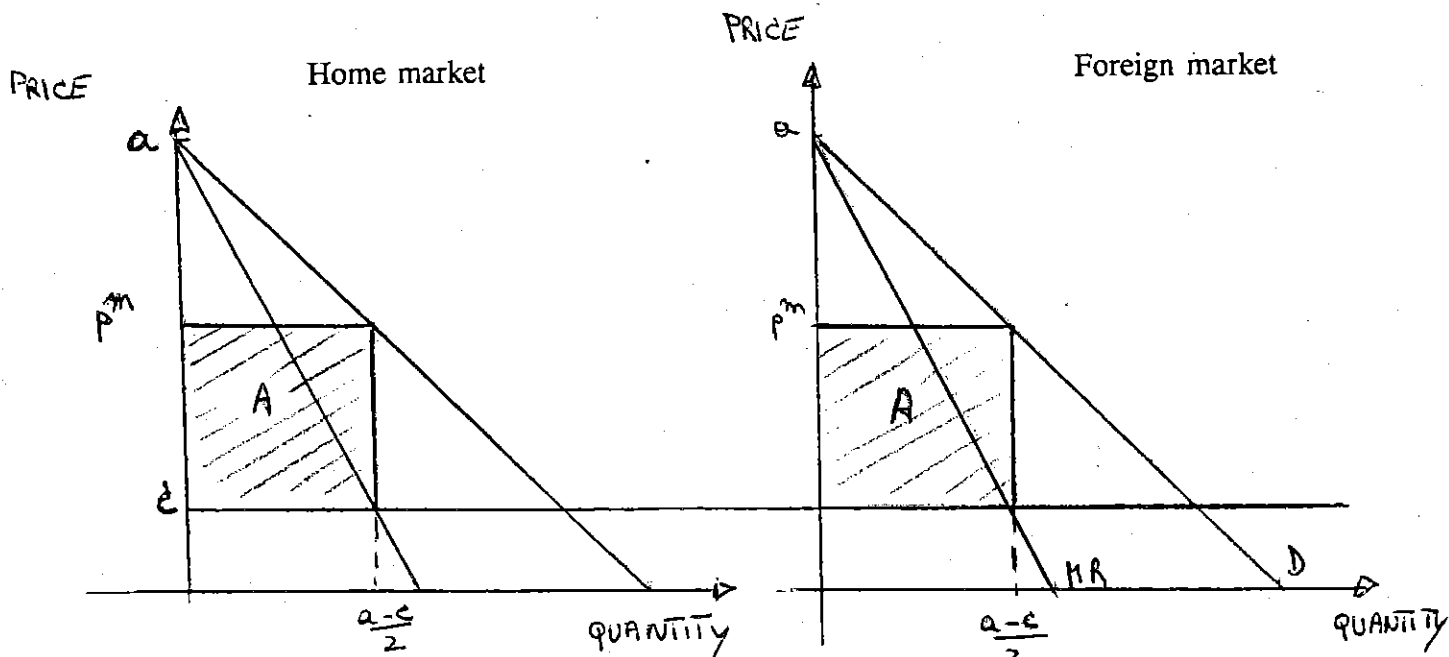
The duty analysis differs from the left hand side of the tree in graph 3. Undercutting by the Home firm after the duty on the left hand side led to a 'win' situation because the Foreign firm could be driven out. On the right hand side, the Home firm can no longer force the Foreign firm out by undercutting because the Foreign firm is willing to use its long purse to incur losses in order to stay in the Home market. Undercutting by the Home firm would result in the Nash equilibrium which is given in table 5 in the bottom right corner where both firms charge a price equal to marginal cost. This gives the Home firm zero (Bertrand) profits (H^B), while the Foreign firm incurs a loss of $A = [(a-c)/2]^2$ in the Home market which equals the long purse in (6). This is illustrated in graph 4. Here neither firm has an incentive to deviate. The Home firm can no longer undercut without a loss, while the Foreign firm will not undercut because that would imply an overall loss since its long purse profits no longer suffice to cover losses in the Home market. Because non-cooperative behaviour leads to a 'no win' situation the Home firm will prefer *cooperation*. The Home firm will therefore set the monopoly price, knowing that the Foreign firm's optimal reply is to follow that price. The Home firm gets half the monopoly profits ($A/2$) while the Foreign firm gets Bertrand profits (F^B) and pays his monopoly rent to the Home country as an Antidumping duty ($GR = A/2$). Home Consumers get minimal surplus just as before the Foreign entry. The payoffs are summed up in table 1 at node 7.

Table 5: Analysis of payoffs after Antidumping duty (ADT = $p^m - c$)

F \ H	p^m	$p^m - \delta$	$p^m - 2\delta$	...	$p^B = c$
p^m	$(A/2, F^B)$	$(0, -\delta(a-c/2 + \delta))$	$(0, -2\delta(a-c/2 + 2\delta))$	...	$(0, -2A)$
$p^m - \delta$	$(A-\delta^2, 0)$	$(A/2 - \delta^2/2, -\delta((a-c)/4 + \delta/2))$	$(0, -2\delta(a-c/2 + 2\delta))$	...	$(0, -2A)$
$p^m - 2\delta$	$(A-4\delta^2, 0)$	$(A-4\delta^2, 0)$	$(A/2-2\delta^2, -2\delta((a-c)/4 - \delta^2))$	...	$(0, -2A)$
...
$p^B = c$	$(H^B, 0)$	$(H^B, 0)$	$(H^B, 0)$	...	$(H^B, -A)$

The symbol δ in the table is used to indicate 'a fraction' which should be understood as a 'very small amount'

Graph 4: Profits of both firms in the Nash equilibrium with the use of the long purse by the Foreign firm



with $A = (a-c)^2/4$

Should the Commission decide on *Undertaking*, the payoffs are the same as on the left hand side of the tree : both the Home and the Foreign firm get half the monopoly rent minus legal expenses ($A/2-\epsilon$), while Home consumers get minimum surplus D (see table 1 node 8).

We now derive the subgame perfect equilibrium path on the right hand side of the game tree in graph 3 by starting in the last subgame and working our way up. In the last subgame the player C has to take the action which yields highest Home welfare (W^H): (see table 1)

node 6	node 7	node 8
'No Measures'	'Duty' (ADT= $(p^m - c)$)	'Undertakings'
$W=D - \epsilon$	$W= D + A - \epsilon$	$W=D + A/2 - \epsilon$

In contrast to the left hand side, it is now optimal for the Commission to choose for the 'duty' because this yields the highest Home welfare. Working our way up, we know that the Home firm will definitely file because the duty protects the Home firm from being driven out of the market :

$$(7) \quad 0 < A/2 - \epsilon$$

The equilibrium path on the right hand side of the tree is therefore: 'File' and 'Duty'.

Now the Foreign firm knows that *going right* and entering in an *aggressive way* leads to the installation of an Antidumping duty (node 7), *going left* and entering in a *non-aggressive way* leads to a situation where no complaint is filed (node 1).

The Foreign firm will compare its payoff in both situations and choose for the left hand

side of the tree where it has Bertrand profits¹⁸ (F^B) rather than the right hand side where the Foreign firm has Bertrand profits minus cost of predation (σ) and legal expenses (ϵ):

$$(8) \quad F^B > F^B - \sigma - \epsilon$$

We summarize the above discussion with giving the equilibrium strategy for each player under Bertrand competition on the left hand side and the right hand side of the game tree respectively:

The equilibrium strategy for player C is {No Measures, Duty}.

The equilibrium strategy for player H is {Not File, File}.

The equilibrium strategy for the Foreign firm is {Non-Aggressive Entry}.

which leads to the following propositions :

Proposition 1 : When competition in the European market is Bertrand and costs symmetric , a rational Antidumping policy in the EU induces a unique subgame perfect Nash equilibrium {NAE, NF, NM} which means that the Foreign firm does not predate, the Home firm does not file a complaint to the Commission and No measures are taken.

Proposition 2 : When competition in the European market is Bertrand and costs symmetric, a non-cooperative Foreign entrant will break up the Home cartel in the face of a rational Antidumping policy in the EU which leads to a perfectly competitive Home market and maximal Home consumer surplus

¹⁸ We assume that none of the firms has sunk costs. Should firms have incurred sunk cost prior to the price competition stage, the Foreign firm would not enter the Home market because zero profits do not allow him to recuperate the sunk costs.

4. Cournot competition and symmetric marginal costs

In this section we analyze the model under the assumption of homogeneous Cournot competition. The set up of the game is identical to the previous section only now firms no longer compete in prices but in quantities.

Table 6 reminds us of the welfare distribution in the Home market prior to Foreign entry:

Table 6: Welfare in the initial situation in the Home market prior to entry

PS^H	$A = (a-c)^2/4$	0.25
CS^H	$D = (a-c)^2/8$	0.125
$W^H = PS^H + CS^H$	$W = 3(a-c)^2/8$	0.375

The third column in table 6 is the result of the division of the elements of column two by $(a-c)^2$ which will facilitate the comparison of the initial situation with the payoffs in each of the final nodes in the three stage Cournot game (graph 5) which are displayed in table 7 and with the welfare changes reported in table 8.

Just as in the previous section we will first describe the game and its payoffs before we look for the subgame perfect Nash equilibrium.

Graph 5: Cournot competition with symmetric costs

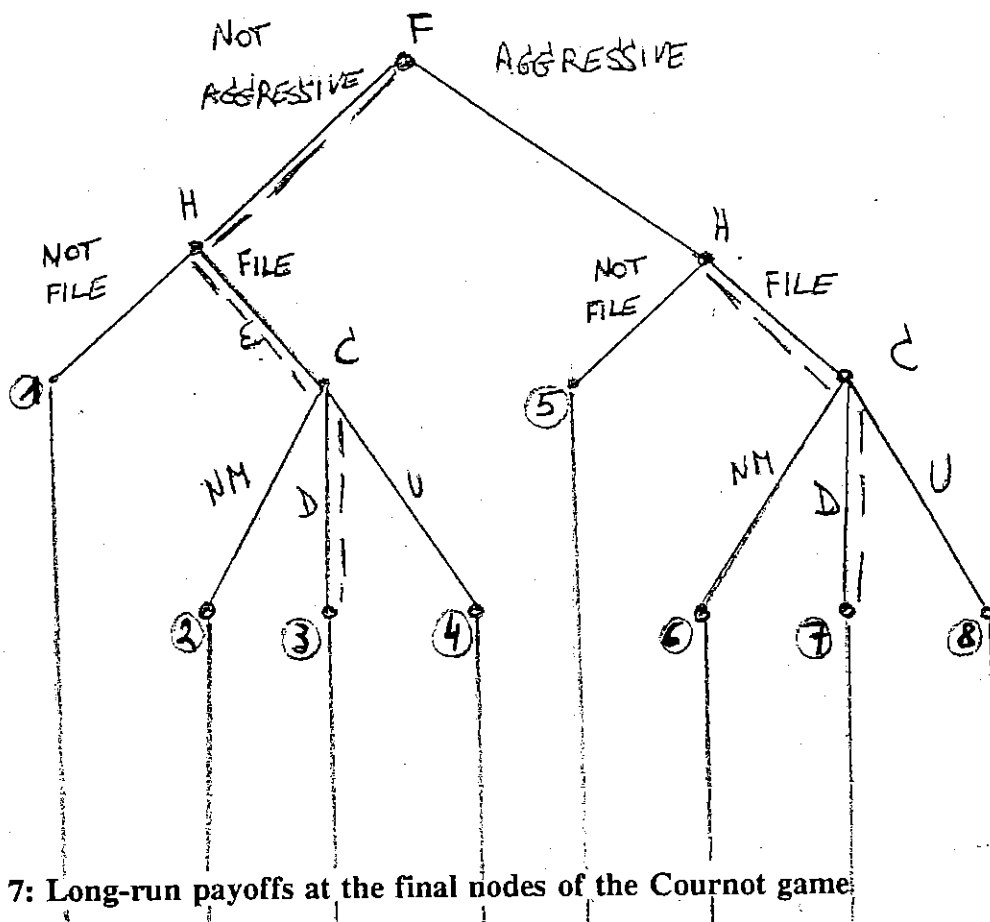


Table 7: Long-run payoffs at the final nodes of the Cournot game

Long-run pay-offs	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
PS ^F	0.11	0.11-ε'	0.04-ε'	0.125-ε'	0.25-σ	0.25-σ-ε'	exit(-σ-ε')	0.125-σ-ε'
PS ^H (I)	0.11	0.11-ε'	0.15-ε'	0.125-ε'	exit	exit (-ε')	0.25-ε'	0.125-ε'
CS ^H (II)	0.22	0.22	0.18	0.125	0.125	0.125	0.125	0.125
GR (III)	0	0	0.03	0	0	0	0	0
W ^H (I+II+III)	0.33	0.33-ε'	0.375-ε'	0.25-ε'	0.125	0.125-ε'	0.375-ε'	0.25-ε'

Each element of the table is divided by $(a-c)^2$ and cut off at maximum three decimals

$$\epsilon' = \epsilon / (a-c)^2$$

Table 8 :Welfare changes under Cournot competition compared to the initial situation

Welfare changes	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ΔPS^F	0.11	$0.11-\epsilon'$	$0.04-\epsilon'$	$0.125-\epsilon'$	$0.25-\sigma$	$0.25-\sigma-\epsilon'$	exit($-\sigma-\epsilon'$)	$0.125-\sigma-\epsilon'$
ΔPS^H (I)	-0.13	$-0.13-\epsilon'$	$-0.09-\epsilon'$	$-0.125-\epsilon'$	-0.25	$-0.25-\epsilon'$	$-\epsilon'$	$-0.125-\epsilon'$
CS^H (II)	+0.09	+0.09	+0.06					
ΔGR (III)			+0.03					
ΔW^H (I+II+III)	-0.04	$-0.04-\epsilon'$	$-\epsilon'$	$-0.125-\epsilon'$	-0.25	$-0.25-\epsilon'$	$-\epsilon'$	$-0.125-\epsilon'$

Empty cells mean that nothing has changed compared to the initial situation

Each element in the table has been divided by $(a-c)^2$ and cut off at maximum three decimals

$$\epsilon' = \epsilon / (a-c)^2$$

Going left in the tree in graph 5 implies that the Foreign firm will set the Cournot quantity which maximizes its profits. The optimal way to respond for the Home firm is to take this quantity as given and to set a quantity which maximizes its profits accordingly. The aggregate quantity on the market results in one single price for both firms in the Home market.

$$(9) \quad p^H(q^H, q^F) = a - q^H - q^F$$

The profit functions for both firms in the Home market are given by:

$$(10) \quad \Pi^i = P^H(q^i, q^j) \cdot q^i - c^i \cdot q^i$$

where $i = H, F$ and $j = F, H$ and $i \neq j$

Under the assumption of symmetric marginal costs the Cournot equilibrium quantities are :

$$(11) \quad q^H = (a-c)/3^{19}$$

$$(12) \quad q^F = (a-c)/3$$

which yields a price :

$$(13) \quad p^H = (a + 2.c)/3$$

The Cournot profits are the same for both firms $(a-c)^2/9$ and reported in table 7 at node 1 as 0.11. The Home firm which previously held profits equal to 0.25 suffers a decline in profits of 0.13²⁰. The increase in competition leads to a welfare gain for Home consumers of 0.09. The total gain of the Home consumers cannot compensate for the loss in Home producers' profits which leads to a decline in total Home welfare after Foreign entry of 0.04. This may seem odd at first since more competition is generally believed to increase welfare. However, the implicit assumption behind this outcome is that, for a given market size, the Foreign entrant does not spend the profits earned in the Home market but repatriates them leaving the Home country worse off than under a Home monopoly.

Let us continue on the left hand side of the tree. The Home firm can decide to go to the Commission in order to ask for protection by showing that injury is suffered due to cheap Foreign imports. Either the Commission declines or accepts the complaint. When it declines 'no measures' are taken and the payoffs in node 2 are the same as in node 1 apart from legal expenses.

As we have no reason to believe that the injury margin is calculated differently in industries which compete in quantities, this is the difference between the monopoly price (p^m) prior to entry and the cournot price (p^H) in the Home market after entry of the Foreign firm in the Home market. The duty calculation on the basis of the level of price-undercutting is:

¹⁹ Note that the aggregate Cournot outcome in the Home market $2(a-c)/3$ is bigger than the output in the initial situation under Home monopoly $(a-c)/2$.

²⁰ cut off at two decimals.

$$(14) \quad ADT = p^m - p^H \\ = (a-c)/6$$

After the duty the Cournot competition resumes. The firms' profit functions in the Home market now look as follows :

$$(15) \quad \Pi^H = p^H(q^H, q^F) \cdot q^H - c^H \cdot q^H$$

$$(16) \quad \Pi^F = p^H(q^F, q^H) \cdot q^F - c^F \cdot q^F - ADT \cdot q^F$$

which lead to the Cournot Nash equilibrium quantities:

$$(17) \quad q^H = (a - c + ADT)/3$$

$$(18) \quad q^F = (a - c - 2 \cdot ADT)/3$$

resulting in the payoffs listed in table 7 at node 3; a profit of 0.04 for the Foreign firm , 0.15 for the Home firm and consumer welfare of 0.18 which involves a rent transfer from Home producers to Home consumers compared to pre-entry (cf. table 8). The government revenue of 0.03 as a result of the Antidumping duty takes away some of the Foreign firm's profits. Total Home welfare after the duty is exactly the same as in the initial situation minus the legal expenses.

If the commission should decide to accept an Undertaking by the Foreign firm, than according to the law a *revision of prices by the Foreign firm is necessary in order to eliminate injury*.

The explicit mention of prices in the legislation, turns the quantity game which ruled previous to institutional intervention into a pricing game²¹ . The payoffs under an Undertaking are the same as in the case of symmetric Bertrand competition and are listed in table 7 at node 4; each firm gets half the monopoly profits 0.125, consumers have the minimal surplus 0.125 and total Home welfare is 0.25.

²¹ which in principle is also possible in the case of an Antidumping duty

Now that we have described all the possible nodes after non-aggressive entry by the Foreign firm we look for the subgame perfect equilibrium path by starting in the final subgame. The policymaker will want to take a measure that on the one hand stops the Home industry from being injured but which at the same time gives highest Home Welfare:

node 2	node 3	node 4
'no measures'	'Duty' ($ADT = p^m - p^H$)	'Undertaking'
$W = 0.33 - \epsilon$	$W = 0.375 - \epsilon$	$W = 0.25 - \epsilon$

These considerations will result in the 'duty'. From the game tree in graph 5 we can see that the Home firm's payoff is bigger under the duty than in the absence of filing but only *if* the legal expenses do not outweigh the increase in profits that the duty brings about. By comparing the Home profits in node (1) with the one in node (3) we can say that the Home firm will only file²² when

$$\begin{aligned}
 (19) \quad & 0.11 < 0.15 - \epsilon/(a-c)^2 \\
 \text{or} \quad & \epsilon/(a-c)^2 < 0.04 \\
 \text{or} \quad & \epsilon/4A < 0.04 \\
 \text{or} \quad & \epsilon < 0.16.A
 \end{aligned}$$

which means that the Home firm will file when the legal expenses involved in an Antidumping case are less than 16% of the total monopoly profits A in the industry .

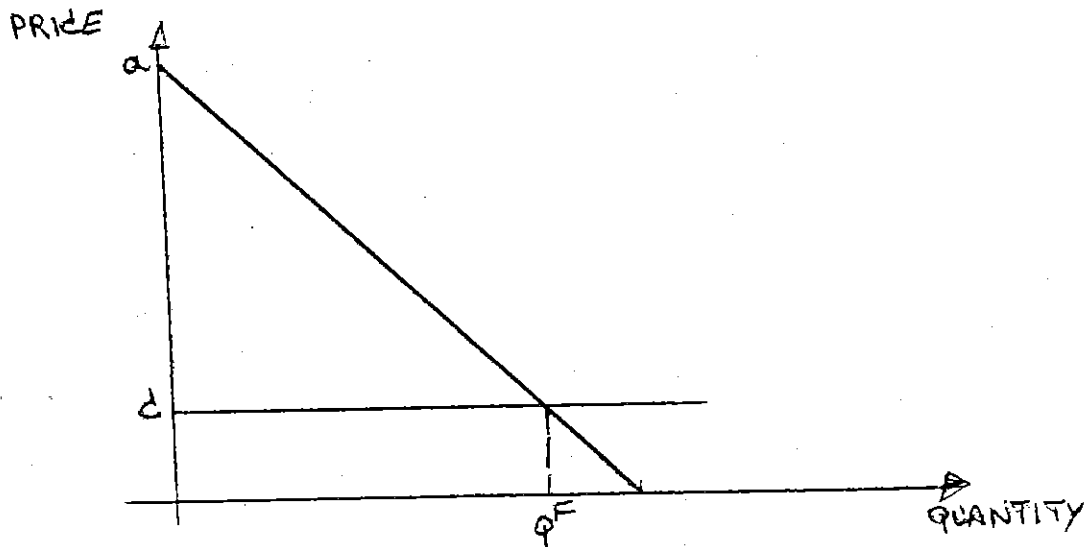
Going left for the Foreign firm means that a case will be *filed* and a *duty* installed.

Going right in the tree in graph 5 implies *aggressive entry*. Predation in a Cournot game is different than in the Bertrand game. Price-undercutting is not possible because both

²² This assumption is a valid one in large cases but is not necessarily true for small cases. Legal expenses are like fixed costs which are independent of the size of the case. With a 'large' case we mean that the volume of import is large enough to reduce the costs of the legal expenses per unit to a fraction of the price. When the import volume is 'small' however the legal expenses per unit of imports weigh heavily and outweigh the benefits of protection. In that case there will be no complaint to the Commission. As we will see later on this will not change the conclusions with respect to the action of the Foreign firm.

firms will sell at the same price, the level which is determined by the sum of their output levels and the market demand. Predatory dumping or aggressive entry by the Foreign firm may be thought of as follows. The Foreign firm can decide to export a quantity $q^F = a - c$ to the Home market such that the price level on the basis of q^F equals marginal cost in the Home market (see graph 6).

Graph 6: Predation under Cournot competition



For any additional quantity that the Home firm puts on the Home market, the price drops below marginal cost. The Foreign firm can make up for losses in the Home market because of the monopoly profits in the Foreign market. The sales of the Home firm however are limited to the Home market only. In this case it is better for the Home firm not to sell anything which gives a zero profit. We assume that entry barriers prevent the Home firm to enter the industry again once it has left. After the exit of the Home firm, the Foreign firm becomes a monopolist and gets payoff $(a-c)^2/4$ which in table 7 is presented by 0.25. Home consumers get 0.125 which is the same welfare as under the Home monopoly. Total Home welfare decreases by 0.25.

In the case where the Home firm files a complaint to the European Union, the policymakers will want to safeguard competition. It can do so by making use of a duty or an undertaking.

The Antidumping duty is the difference between the price prior to entry and after entry

of the Foreign firm in the Home market:

$$(19) \quad ADT = p^m - c \\ = (a-c)/2$$

When Cournot competition is resumed after the duty, firms face the profit functions in the Home market given by (15 and 16) which results in the following Cournot Nash equilibrium quantities (20 and 21):

$$(20) \quad q^H = (a-c)/2$$

$$(21) \quad q^F = 0$$

which suggests that after the duty it is no longer profitable for the Foreign firm to sell on the Home market. The quantity offered by the Home firm after the duty is the monopoly quantity giving the Home firm monopoly profits minus legal expenses $(0.25 - \epsilon)$. The Home cartel is restored and Home consumers still have minimal welfare of 0.125 like before the Foreign entry.

The payoffs under an Undertaking are given in node 8 of the tree in graph 5. They are the same as in symmetric Bertrand competition. The Home firm, cooperative by nature and not in a position to drive the Foreign firm out, will set the monopoly price and the Foreign firm will follow this price. (see table 4) leaving each firm in the Home market with half the monopoly profit $A/2 = 0.125$ minus legal expenses and Home consumers with minimal surplus $D = 0.125$.

Now we start at the lower end of the tree on the right hand side and we ask ourselves what action would be chosen by the rational policymaker when a case arrives at the Council after an aggressive entry by the Foreign firm. Home welfare (W^H) under the three actions is:

node 6	node 7	node 8
No measures	'Duty' ($ADT = p^m - c$)	'Undertaking'
$W = 0.125 - \epsilon$	$W = 0.375 - \epsilon$	$W = 0.25 - \epsilon$

The 'duty' yields the highest Home welfare which implies that the Home firm will file a complaint. The equilibrium path on the right hand side of the tree in 7 is therefore: 'file' and 'Duty'.

The Foreign firm will compare its payoff on the left with the payoff on the right. In both cases a duty awaits him. The Foreign firm will decide to go left because there the Antidumping duty gives him a positive profit whereas on the right hand side he would have to leave the market:

$$(22) \quad 0.11 > 0$$

We summarize the above discussion with the equilibrium strategies of the three players:

The equilibrium strategy for player C is {Duty, Duty}

The equilibrium strategy for player H is {File, File}

The equilibrium strategy for player F is {Non-Aggressive Entry}

which leads to the following proposition :

Proposition 3: When there is Cournot competition and costs are symmetric, the unique subgame perfect Nash equilibrium is {NAE, F, D} which means that the Foreign firm does not predate, nevertheless the Home firm files a complaint to the Commission and an Antidumping duty is installed

The theoretical framework which we developed also suggests several robust results by which we mean that they hold irrespective of whether we work under the Cournot or the Bertrand assumption:

Proposition 4 : Irrespective of the degree of price-competition after the Foreign entry, a rational policymaker in the Home country always prefers and Antidumping duty to an Undertaking.

which automatically leads to the next proposition

Proposition 5 : Irrespective of the degree of price-competition after the Foreign entry, the preference for an Antidumping duty inhibits the Foreign firm from predatory action

and with respect to the survival of the Home cartel we can say that:

Proposition 6: Irrespective of the degree of price-competition, the Home cartel will disappear after the Foreign entry in the presence of a rational policymaker which leads to lower Home producers' profits but increased Consumer welfare.

Another result which may seem trivial here but which will become important in the next section is that :

Proposition 7: Irrespective of the degree of price-competition after the Foreign entry, the Foreign firm will always prefer an Undertaking to a Duty

From the theoretical point of view Undertakings are not interesting because they should never be decided upon by a rational government acting in the interest of total Home welfare. Empirical evidence presented in the next section suggests otherwise.

5. Antidumping Policy and cartel survival

In the above, it became clear that when the Policymaker maximizes Home welfare, we should either not observe any Antidumping measures at all (Bertrand competition) or the use of Antidumping duties (Cournot competition). In both cases the Home cartel is broken up after Foreign entry. The theory suggests that irrespective of the degree of price competition, Undertakings should never be chosen because they are never optimal.

Table 9 lists the evidence reported by Messerlin (1991) on 98 antidumping cases initiated and decided upon between 1980 and 1989, which are related to antitrust cases. Especially the non-market economies (NME's) are often involved in antidumping cases twinned to anticartel cases. These antidumping cases represent 25% of all cases of that period. In 15 of these cases, duties were the only measure taken. However in 21 instances, the Commission decided to end the Antidumping case with the acceptance of a Price-Undertaking. The Commission's preference for Undertakings is in sharp contrast with what the theory predicts. Because of their detrimental effect on Home consumers' welfare we expect a rational policymaker always to prefer duties. Several reasons have been suggested which could explain this observation. Tharakan (1992) puts forward the 'compensation for vulnerability' hypothesis. His findings suggest that especially the non-market economies are subject to the finding of dumping. In order to compensate this country group for this affirmative finding bias of dumping, the Commission accepts the 'softer' option of an Undertaking which allows exporters from these countries to increase their prices and pocket the price difference. Anderson (1992) points out that when the retaliatory power of an exporting country is considerable, a price-agreement can be preferred to a duty²³. Both elements imply that it may very well be that the Commission's objective function is not limited to Home welfare, but that the Foreigner's welfare is also taken into account. Another explanation for the use of Undertakings could be that the policymakers act in the interest of well organised special interest groups in society rather than in the overall interest. This hypothesis is the subject of the political economy of protection studies. Producers tend to be better organised and fewer in number than consumers. Since an Undertaking is profitable for both the Home and the Foreign firm the decision of protection may very well be the outcome of a political lobbying process.

In this paper we are only interested in the effects of Undertakings on firms' actions in the Antidumping game. Table 10 is constructed on the basis of table 9 and shows the number of Undertakings and duties decided upon per country group. It becomes clear that in the face of a European cartel an exporter from a non-market economy is almost certain that

²³ The model presented in this paper is a partial equilibrium analysis where the Home firms is not allowed to export. Therefore retaliation is not at issue. However in a general equilibrium framework retaliation is possible.

in the event of protection he is facing an undertaking whereas exporters from Industrialised and Newly industrialised countries on the basis of the case evidence in table 10 have a higher chance of facing an Antidumping duty. Now suppose that an exporter's subjective probability is such that he is certain that an undertaking will be accepted in the event of protection. How will this affect his behaviour ?

Table 10: Undertakings and Duties in Twin cases (1980-1989)

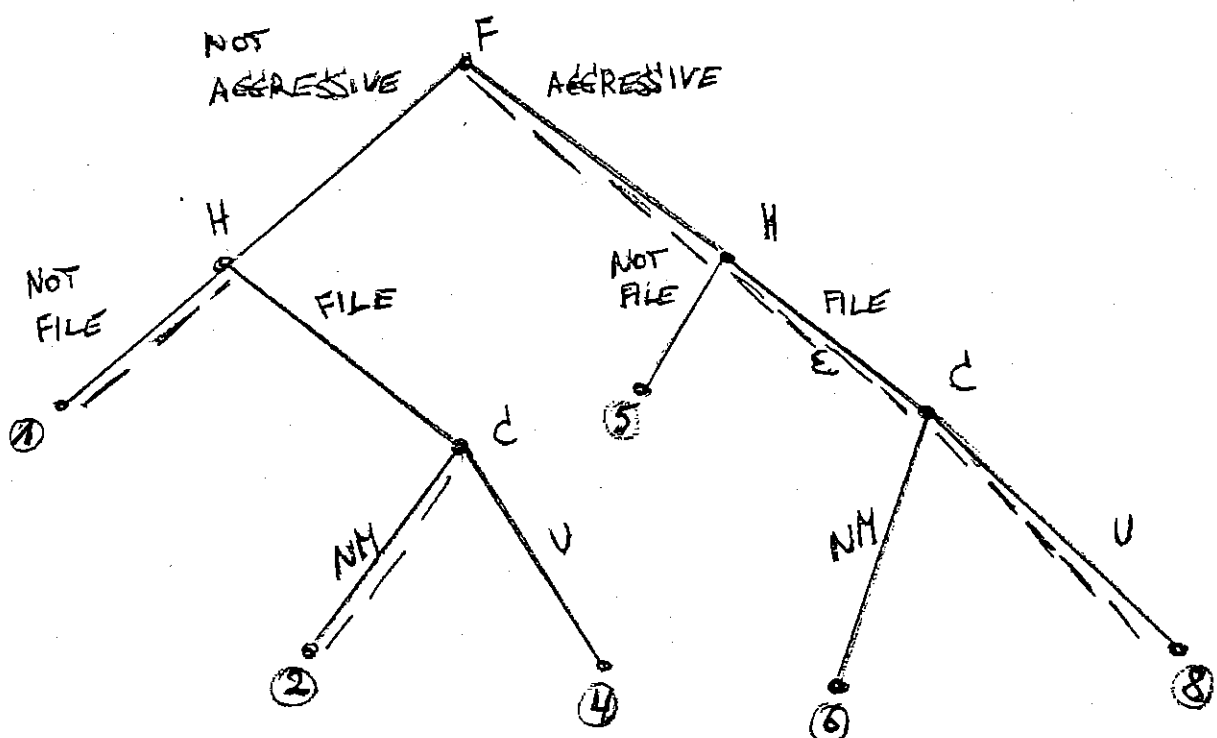
Undertakings			Duties		
IC	NIC	NME	IC	NIC	NME (a)
2	6	21	5	9	1

note: we dropped cases where table 9 reports that two types of measures were taken

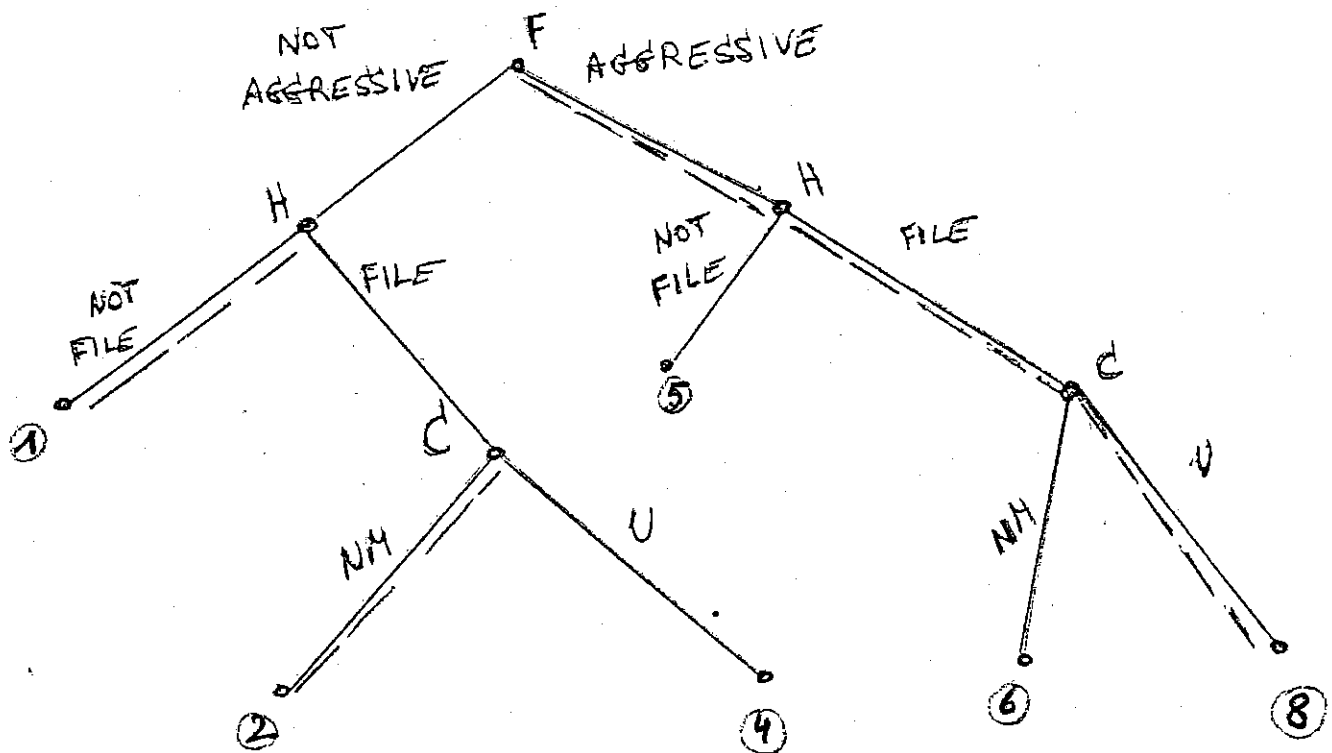
(a)IC: Industrialised Countries; NIC: Newly Ind countries; NME: Non-market Economies

Graph 7 shows this new game tree under Bertrand competition and graph 8 under Cournot competition. We still assume that the policymaker C trades off Home welfare in the presence compared to the absence of protection but now we limit the range of instruments for protection to 'Undertakings' only.

Graph 7: Bertrand competition where firms face Undertakings



Graph 8: Cournot competition where firms face Undertakings



The subgame perfect Nash equilibrium is the same irrespective of the degree of competition in the industry. After a non-aggressive entry on the left hand side the policymaker C chooses not to take any measures. However, after an aggressive entry by the Foreign firm on the right hand side of the trees, player C chooses for the Undertaking. Comparing its payoff left and right, the Foreign firm will now prefer to go right both under Bertrand and under Cournot competition. This implies *aggressive entry* by the Foreign firm in the Home market knowing that the Home firm will *file* a complaint to the Antidumping Committee in order to get Antidumping protection in the form of an Undertaking which makes both firms better off at the expense of Home Consumers. In both cases the Home cartel is restored and the Foreign firm is now taking part in it.

Proposition 8 : Irrespective of the degree of price-competition, the use of Undertakings gives rise to predatory action by the Foreign firm

Proposition 9: Irrespective of the degree of price-competition, the use of Undertakings gives rise to an international cartel in the Home country

Table 9: Twin cases in the EU (1980-1989)

Products	Year of anti-trust decision	Antidumping cases					Antidumping measures
		year	IC's	NIC's (a)	NME's	Total	
Glass cast	1980	1983			6	6	Undertaking
Plywood	1980	1978			1	1	No dumping
Soda Ash	1981	1978			4	4	Duty & Undert
Glass.Float	1981						
	1984	1985		2	4	6	Undertaking
Steel,cast iron	1983	1980		1		1	Undertaking
		1985	1	3		4	No dumping
Perox.Hydrog Aluminium	1984 1984	1982	1	1	2	4	No dumping
		1983	1	3	1	5	No dumping
Wood pulp	1984	1978	4			4	No injury
Polypropyl.	1986	1981	1			1	Undertaking
PVC	1988	1981			4	4	Undertaking
LdPe	1988	1982			4	4	Undertaking
Soda Ash	1989	1982	1			1	Duty & Undertak
Cement	1989	1985		2	2	4	No dumping
Tyres,trucks	1981	1979		1	3	4	Undertaking
Peroxide Org	1983	1983	1			1	Duty & Undert
Plywood	1983	1981	2			2	No dumping
Titanium	1982	1984	2			2	No injury
TV's, K7, VC R's, CD's	1981	1979	1			1	No dumping
	1982	1981	1			1	No dumping
	1983	1982	1			1	'arrangement'
	1984	1987	1	1		2	Duty
		1987	1	1		2	Duty&Undertaking
Titan,alloys	1982	1977	1			1	No dumping
Synth.Fibre	1984	1972		2		2	Undertaking
		1978	1			1	Undertaking
		1979	2	3		5	Duty & Undert
		1980	1			1	No dump&Duty

Product	Year of anti-trust decisions	Antidumping cases				Total	Antidumping Measures
		Year	IC's	NIC's	NME's		
		1983		1		1	No dumping & Undertaking
		1985		3	1	4	No dumping & Undertaking
		1986		2	2	4	No injury
		1987	1	4	1	6	Duty
		1987		4		4	Duty
Colour films	1987	1983	1			1	No dumping & Undertaking
Photocopiers	1987	1985	1			1	Duty
Printers	1987	1987	1			1	Duty
		1987	1			1	Duty
TOTAL			29	35	34	98	
% (b)	22.5		27.4	25.9	22.5	25.1	

Source : Messerlin (1991)

(a) IC: Industrialised Countries; NIC: Newly Ind countries; NME: Non-market Economies

(b) in percent of all similar antitrust or antidumping cases of the same group of countries

6. Conclusion

In this paper we have discussed the Antidumping game in the European Union under alternative degrees of price-competitions. We have assumed that the European policymakers thereby try to maximize Home welfare despite the arbitrary injury determination.

This can be thought of as follows. Every Antidumping case is investigated by the Antidumping committee who prepares a report for the Council of ministers where an

actual decision is taken. The Antidumping Committee consists of bureaucrats who simply apply the rules specified in the Antidumping legislation. Rules of thumb like the degree of Foreign price-undercutting for the purpose of injury determination can hereby be observed. This arbitrariness makes it possible for Home cartels to apply to the Commission for protection after entry of a non-cooperative Foreign firm in the Home market. Our results suggest that an Antidumping duty is always preferred to an Undertaking and that the threat of a duty is sufficient to prevent the Foreign firm from driving the Home firm out of the market. Moreover, the Home cartel will never survive. Protection in the form of a duty is a possible outcome but only in industries where there are rents to be shared after the Foreign entry.

Empirical results however suggest that the majority of antidumping cases twinned to antitrust cases result in the acceptance of Undertakings. The use of Undertakings by the Commission results in an international cartel and monopoly rents for both firms. Since this form of protection is profitable to the Foreign firm, Undertakings will induce the Foreign firm to act in an aggressive way in order for the Home firm to apply for protection. This Undertakings game is played over the heads of Home consumers who are deprived of welfare which in the absence of Undertakings would be rightfully theirs.

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