Do Anti–Dumping Rules Facilitate the Abuse of Market Dominance?

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Abstract

We discuss the effects of AD–protection in a standard Dixit model of entry deterrence. In an AD–regime, the newcomer is constrained by a minimum–price rule in addition to existing irreversible entrance costs. For minimum prices which lie below the Stackelberg one, we find that AD–rules distort competition. We show that AD–protection increases the advantages of entry deterrence for a wide range of combinations of sunk costs and minimum prices. When entrance costs are high, consumer welfare is lower in an AD–regime than under free trade. Consequently, AD–protection facilitates the abuse of market dominance.

1 Introduction

Anti–dumping (AD-) actions are legitimate measures permitted under Article VI GATT/WTO rules, and are by now the most frequently employed instrument of 'contingent protection'[1]. Over the past decade, almost 2,500 AD cases were investigated and notified to the GATT. Of these, almost 50 per cent were initiated by the four 'traditional' user countries[2] and approximately 40 per cent by developing countries as Mexico, South Africa or India.[3] Hence, AD–protection is a global phenomenon. The effects of AD–measures therefore deserve scrutiny.

The rational of AD–laws is to protect domestic competition from 'unfairly' low priced imports. However, a large and still growing body of literature has argued that it is not dumping but AD–policy, which undermines competition as AD–rules have unintended, anti–competitive side–effects. Here, the bulk of the literature has concentrated on the 'collusive impact' of anti–dumping, i.e. on only one particular type of competition restricting behaviour.[4]

The objective of this paper is to analyse whether AD-policy facilitates the 'abuse of a dominant market position', which is another form of anti–competitive business conduct. According to an OECD-definition, a firm abuses its dominance, if "it is systematically restricting the ability of actual or potential competitors to serve consumers, and is doing this without at the same time achieving efficiencies benefiting consumers." (OECD, 2000, p. 2) The main question we pose in this paper is how AD–rules alter the capability of incumbent firms to defend their monopoly position vis–a–vis *potential* competition, in other words how AD–legislation affects the contestability of a market.

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1 Contingent protection refers to anti–dumping and countervailing duties (Article VI) and emergency protection under the GATT–WTO's principal safeguards clause (Article XIX).

2 They are the European Union (EU), Australia, the United States (US) and Canada.

3 These numbers are taken from UNCTAD (2000). A number of recent studies have also documented the recent increase in the global importance of anti–dumping. See e.g. Miranda et al. (1998), Kempton et al. (1999) as well as Finger and Schuknecht (1999).

4 For example, Prusa (1992) and Panagariya and Gupta (1998) demonstrate how AD legislation can be used to *reach* collusive agreements, Fischer (1992), Reitzes (1993), Prusa (1994), Steagall (1995) and Pauwels et al. (1997) show how contingent protection may facilitate *tacit collusion* , while Staiger and Wolak (1989) as well as Hartigan (2000) discuss how AD-rules affect the ability to *sustain* collusion among domestic and foreign firms.

To analyse this question, we employ a variant of the well–known Dixit model of entry deterrence where an incumbent firm and a potential foreign rival interact.[5] We compare two different regimes: a free trade regime as well as an AD–regime. Under free trade, market access of the potential foreign entrant is restricted only due to the existence of sunk costs. Under AD–rules, the newcomer additionally faces a price restriction, which forbids him to undercut an exogenously specified minimum price.

The paper proceeds as follows: in section 2, we describe the indispensable institutional and legal framework of AD–legislation and explain why AD–rules serve to establish minimum prices. In section 3 we briefly present Dixit's model. The effects of the minimum price rule are analysed in section 4. We discuss our main results in section 5. Section 6 concludes.

2 Institutional and legal background

Article VI of the GATT–1994 and the WTO–AD–Agreement (ADA) allow its signatories to impose duties on imports if two conditions are met: first, products are dumped, i.e. introduced into the commerce of the importing country at less than their 'normal' or 'fair' value. Second, dumping causes 'material' injury to the domestic firm. The ADA requires that AD–duties must be ne higher than the dumping margin (i.e. the difference between the normal value and the import price). Moreover, their imposition is only allowed after dumping and injury have been proven in a formal investigation, initiated by an application by or on behalf of the domestic industry.[6]

In section 4, we model AD–legislation as a minimum price rule which forbids the foreign firm to undercut the 'normal value' or the 'fair price' of the product. Moreover, we assume that the normal value is exogenous to domestic and foreign firms. In the following, we briefly explain the reasons for these two assumptions.

The assumption that AD–legislation de facto establishes a minimum price, has two reasons: first, WTO rules explicitly envisage the *direct* introduction of import minimum prices through the negotiations of so–called price undertakings. According to Article 8.1 ADA, authorities have the discretion to terminate or suspend proceedings without imposing duties if an exporter commits to "revise its prices [...] so that the authorities are satisfied that the injurious effect of the dumping is eliminated".[7] Moreover and secondly, minimum prices may also be established *indirectly*: For example, in the US, no duties as such are levied, but exporters are required to make cash deposits: if no dumping is found in a review investigation one year later, the exporter receives a full refund of the cash deposit, including interest. Hence, exporters have strong incentives to adjust their prices to the minimum price in order to avoid the duty payment. [8]

The assumption that the minimum price, i.e. the normal value of the product in question, is exogenous to the foreign firm, at first glance, seems to contradict the usual definition of price–dumping. In fact, article 2.1 ADA indicates that national authorities should preferably establish the normal value of the similar product on the basis of the exporter's home market price. This seems to imply that the foreign firm always has the option to avoid dumping by sufficiently raising the price he charges on his domestic market. However, if there are "not enough sales in the 'ordinary' course of trade in the

[5] See Dixit (1980). There is a considerable amount of trade policy literature which applies the capacity commitment approach, or variations on it, to analyse entry-deterring behaviour. See the papers by Brander and Spencer (1987), Dixit and Kyle (1985), Ishibashi (1991) and Campbell (2000). Neither one of this paper has applied the framework of Dixit. Moreover, most of the papers assume that the foreign firm is the incumbent and hence discuss the role of trade policy to 'promote', instead of deter entry. The exemption is Campbell (2000) who discusses the effects of an import quota on entry–deterring behaviour in a Milgrom and Roberts type model.

[6] The term 'material injury' is not precisely defined in multilateral trade rules. In fact, the ADA lists 15 injury indicators, whereas an affirmative finding can be established even if none of these indicators points towards the existence of material injury, as article 3.4 ADA explicitly states that no factor can give decisive guidance.

[7] See Moore (2000b) and Pauwels and Springael (2000) for a review of the practice of undertaking-acceptance in the US and the EU respectively.

[8] The situation is different in the EU, where a prospective duty system is employed: the level of the duties is set on the basis of past performance and applies to all future exports until the AD order expires. However, exporters can apply for a review and claim refunds if they can show they are dumping no longer. Moreover, the Commission can impose additionally (retroactive) tariffs if the foreign firm continues to dump. Again, there are considerable incentives for foreign firms to refrain from undercutting the minimum price.

domestic market of the exporting country" (ADA, Article 2.2), authorities may choose between two alternative methods of normal value calculation. The first alternative is to 'construct' the normal value, which involves adding a 'reasonable' profit margin to the production costs in the foreign local market. The second alternative is to establish the fair value on the basis of the foreign producer's export price to a third country. Obviously, national authorities have considerable discretion (and firms little direct influence besides lobbying) in determining the reasonableness of a certain profit margin, or the choice of an adequate third country. It follows that — at least in all cases where dumping is not defined as price dumping[9] —, it is sensible to assume that the normal value is a politically specified minimum price, which is exogenously imposed on the firms.[10]

3 The Basic Model

A variant of the Dixit (1980) model is applied to analyse the effects of AD–regulations in the form of a minimum–price rule. Although it is well understood, we present it elaborately as the analysis of the model below closely follows the Dixit one.

3.1 Demand, Cost and Profit Functions

We consider a two–stage model of perfect information. In the first period t_1, a domestic firm (H) operates on the market. It has the opportunity to extend its production capacity k_H. At the end of the first period, a foreign firm (F) decides whether to enter the market or not. In the second period t_2, both firms simultaneously choose the quantities. In deciding on the next period's capacity level, the domestic firm anticipates both the entry decision of the foreign firm and the outcome of the second–stage quantity game. Similarly, when the foreign firm decides on entrance, it anticipates the outcome of the second–stage game.

The firms face a time–invariant demand function. It is assumed to be linear, so that the inverse demand function can be written as

$$p(q_H, q_F) = a - b(q_H + q_F), \tag{1}$$

where q_H and q_F denote the quantities supplied by the domestic and foreign firm respectively. The parameter a is the reservation price.

In the first period t_1, the domestic firm can expand its capacity k_H. One unit of capacity can be used to produce one unit of the consumption good. When the incumbent's output in t_2 is less than the previously installed capacity, it incurs a constant unit cost c and fixed costs of rk_H to maintain the capacity.Given the domestic firm maintains a capacity level k_H at the beginning of t_2 but wishes to produce more than k_H units of output, it has to further extend the capacity level. This causes costs of $r(q_H - k_H)$ in addition to the production costs when $q_H < k_H$. Therefore, the incumbent's cost function for the entry period t_2 reads

$$C_H = \begin{cases} cq_H + rk_H & \text{if } q_H < k_H, \\ (c+r)q_H & \text{if } q_H = k_H. \end{cases} \tag{2}$$

When the previously installed capacity level is sufficient for the desired output, the marginal costs are c. In contrast, the latter equal $c + r$ when the firm chooses to extend the capacity in the second period. Hence, the incumbent's possibility to install capacity in the pre–entry period t_1 gives him a cost advantage.

In t_1, the foreign firm is not present in the market, so that it has to install the required capacity when entering the market. For the foreign firm, the operating costs are $c + r$ per unit of output. However,

[9] Even in this case, the normal value is frequently established on the basis of the 'facts available', if foreign firms are found to only partially co–operate in the investigation process. In this case, home market prices are determined on the basis of rough allegations of the complaining domestic industry. See Palmeter (1991) and Moore (2000a) for more details as well as for reasons why firms frequently fail to co–operate with AD–authorities during the investigation process.

[10] Finger (1993, p. viii) also concludes that "dumping is whatever you can get the government to act against under the anti–dumping law".

entering the domestic market is associated with irreversible expenses z. As the domestic firm is already operating in the market, it has already made this investment. The foreign firm's cost function can be written as

$$C_F = (c+r)q_F + z. \tag{3}$$

Both firms face a two–stage decision problem. In the first stage, the incumbent chooses the next period's capacity level and the foreign firm decides whether to enter. Conditional on the strategies chosen in the first period, the second stage is formed by the simultaneous quantity choice of both firms. Each firm will take the actions, which promise the highest profits, where the profit function is given by

$$\pi_i = p(q_H, q_F)q_i - C_i \quad i = H, F. \tag{4}$$

In selecting the own quantity, the forms regard the opponents quantity as given. The firms' best response function can be derived by

$$q_i = \frac{S - q_j}{2}, \quad i = H, F, \quad i \neq j, \tag{5}$$

where $S =: (a-c-r)/b$ is the total quantity when the price equals the marginal costs $c+r$.

3.2 The Strategies

The incumbent has two advantages over a potential entrant. By installing capacity in the pre–entry period, he commits himself to a certain output. This gives him a cost advantage as the next period's marginal costs are lower. Yet, he has also a strategic advantage as the first move gives him the possibility to choose his most desired outcome.

In deciding on the capacity level, the domestic firm has several options. Given the threat of entry is credible, the incumbent may defend its market by installing a capacity level rendering a non–positive profit for the potential entrant. Alternatively, the domestic firm may allow entrance. In this situation he acts as the Stackelberg leader.

Whenever the incumbent chooses the latter option, he picks a point on the foreign firm's reaction function, which maximises his own profit. Inserting the entrant's reaction function into the incumbent's profit and maximising the latter with respect to the quantity results in $q_H^S = S/2$. The entrant's output can be derived with the $q_F^S = S/4$. In a Stackelberg situation, the domestic firm's profit is given by

$$\pi_H^{FS} = \frac{b}{2}\left(\frac{S}{2}\right)^2, \tag{6}$$

were the superscript F stands for free trade and indicates that no AD–regulation exists. The superscript S marks variables specific for a Stackelberg outcome. Similarly, entrant earns profits of $\pi_F^S = b(S/4)^2 - z$. Clearly, the foreign firm only enters the market if he receives a positive profit. Accordingly, for entrance costs satisfying

$$z \geq z^B =: b(S/4)^2,$$

the exporting firms stays out of the market and entry is blocked. For those entry barriers, the threat or entrance is not credible, so that the domestic firm behaves as a monopoly.

If the domestic firm decides to defend its market, he chooses a capacity in t_1 and an equivalent output in t_2, so that entry becomes unprofitable for the potential exporting firm. The best response to every possible output level of the incumbent is given by equation (5). This results in a profit of $\pi_F = b(S-q_H)^2/4 - z$. It can be shown that the profit is non–positive, when the following inequality holds:

$$q_H \geq k_H^{FD} =: S - 2\sqrt{\frac{z}{b}}, \tag{7}$$

where the superscript D denotes 'deterring'. If the foreign firm observes an installed capacity level of $k_H \geq k_H^{FD}$ and believes that the incumbent fully utilises this capacity level in case of an entry, it will

stay out of the market. Entry would result in non–positive profits so that the entry is deterred whenever $k_H \geq k_H^{FD}$.

Whether the incumbent deters or allows entry depends on the profit associated with the appropriate alternative. Let π_H^{FD} denote the profit resulting from the deterrence strategy. Then, the incumbent defends his market as long as $\pi_H^{FD} > \pi_H^{FS}$, where π_H^{FS} is given in equation (6).

Using the equation (5) together with (2) in the profit function and noting that q_F equals zero when entry is deterred, yields

$$\pi_H^{FD} = 2b\sqrt{\frac{z}{b}}\left(S - 2\sqrt{\frac{z}{b}}\right). \tag{8}$$

Comparing both profits shows that $\pi_H^{FD} > \pi_H^{FS}$ when z is higher than $z^{DL} =: bS^2(3-2\sqrt{2})/32$ and lower than $z^{DU} =: bS^2(3+2\sqrt{2})/32$ (cf. appendix). As $z^{DU} > z^B$, $z \geq z^{DU}$ are irrelevant.

Depending on the level of the entrance costs, the incumbent can employ three strategies. When entrance costs are high, i.e for $z \in [z^B, \infty)$, entry by an exporting firm is not credible, so that the domestic firm behaves as a monopolist. In this situation, he produces $q_H^m = S/2$ and receives the monopoly profit $\pi_H^m = b(S/2)^2$. If the entry barrier is lower, i.e. for $z \in [z^{DL}, z^B)$, the incumbent finds it profitable to deter entry. He produces the quantity equivalent to the capacity specified in equation (7) and balance a profit of π_H^{FD}. For entrance costs satisfying $z \in [0, z^{DL})$, the domestic firm allows the foreign firm to enter the market. Then, he produces the quantity of the Stackelberg leader $S/2$ and receives π_H^{FS}.

4 The Model with a Anti–Dumping Regulation

This section introduces an AD–regulation specifying a normal value into the above described model. It is assumed that the AD–measures are enforced whenever the market price is lower than an exogenously specified norm price p^n. However, in models with perfect information, the AD–measures need never be executed. Rather, the normal value imposes an additional restriction to the firms. Apart from the normal value, the model is identical to the one presented in the previous section.

It is reasonable to assume that the norm price is higher than the market price under perfect competition $c+r$, but lower than the monopoly price p^m, i.e. $p^n \in [c+r, p^m]$. After the foreign firm has entered the market, AD–measures cannot be enforced as long as the market price p exceeds the norm price, i.e. if $p \geq p^n$. This establishes a price restriction influencing the foreign firm's entry decision. As the firms set quantities, it is convenient to transform the price restriction into an equivalent quantity restriction. Employing the inverse demand curve (1), each norm price has a corresponding norm quantity Q^n, $Q^n = (a - p^n)/b$. It follows that the price restriction $p \geq p^n$ is satisfied if the total quantity supplied Q is lower than the norm quantity, i.e. when

$$Q \leq Q^n. \tag{9}$$

It can also be assumed that the norm quantity will take a higher value than the monopoly quantity Q^m and lower than the competitive one S. Hence, the valid range for the norm quantity is $Q^n \in [S/2, S]$.

4.1 The Entrant's Reaction Function

In the second stage of the game, the foreign firm chooses its quantity q_F, so that profits are maximised. As opposed to the last section, two situations can be distinguished: when the price restriction or equivalently the quantity one are constraining and when it has no effect. Maximising the profit function subject to the quantity restriction given in equation (9) yields the exporting firms reaction function with (cf. appendix)

$$q_F = \begin{cases} (S - q_H)/2 & \text{if } q_F \leq Q^n - q_H, \\ Q^n - q_H & \text{else.} \end{cases} \tag{10}$$

The upper line specifies the behaviour of the entrant if the quantity restriction is ineffective. It is identical to the one in equation (5). It shows that the entrant responds to an increase of the incumbent's quantity

by 2 units with a reduction of one unit. When the quantity restriction is binding, the second line is relevant. Then, the exporting firm's reduction in production has to meet the incumbent's increase in output. Otherwise, the market price would fall below the normal value and the AD–measures would be enforced.

4.2 The Incumbent's Options

It is worth mentioning that the incumbent decides whether the price restriction is binding or not, due to his first–mover advantage. As a consequence, the domestic firm can choose between two sets of strategies: the free–trade and the AD–strategies. We refer to free–trade actions whenever the incumbent behaves as though no AD–regulation exists, i.e. when the latter is ineffective. In contrast, AD–strategies are those when the domestic firm chooses a capacity, so that the price restriction becomes binding. As the free–trade strategies were presented in the last section, we focus on the AD–ones here.

When the quantity restriction (9) is binding, the entrant's reaction function is given by the lower line in equation (10). It follows that the incumbent's profit reads $\pi_H^P = (S - Q^n)q_H$ and is valid when $q_H \geq 2Q^n - S$. In addition, the quantity supplied by the domestic firm will not exceed the norm quantity, so that $q_H \leq Q^n$. The appendix shows that the incumbent's optimal output is given by

$$q_H = Q^n \quad \text{if} \quad q_H \in [2Q^n - S, Q^n]. \tag{11}$$

The equality between the incumbent's output and the norm quantity results as the profit function fails to be strictly concave in the quantity q_H when the restriction (9) is binding. The intuition behind this result is simple. The incumbent knows exactly that expanding the output by one unit will induce the exporting firm to reduce his output by the same amount. When the entrant responds differently, AD–measures are enforced. As a consequence, the price cannot drop below the normal value. In addition, equation (11) shows that no entry occurs as long as the price restriction is binding. Inserting (11) into the profit function and noting that q_F is zero yields the incumbent's profit with

$$\pi_H^{PS} = bq_F^* Q^n. \tag{12}$$

However, the domestic firm need not produce the norm quantity to prevent market entry. The best response of the exporting firm to an arbitrary level of output q_H is given by the lower line of equation (10). The corresponding profit is $\pi_F = b(S - Q^n)(Q^n - q_H) - z$. Accordingly, the entrant would earn non–positive profits when actually entering the market if

$$q_H \geq k_H^{PD} =: Q^n - \frac{z}{b}\frac{1}{q_F^*}, \quad q_F^* = S - Q^n, \tag{13}$$

where q_F^* is the foreign firm's output which is determined by the intersection of the reaction functions (10) for the cases when the restriction is binding and not binding. Therefore, entry is deterred for the incumbent's quantities specified in (13). When the incumbent chooses an output level equal to the entry deterring capacity, his profits are

$$\pi_H^{PD} = b\left(q_F^* + \frac{z}{b}\frac{1}{q_F^*}\right)\left(Q^n - \frac{z}{b}\frac{1}{q_F^*}\right). \tag{14}$$

Given the quantity restriction is binding, whether the incumbent chooses to produce a quantity equivalent to the norm quantity or to the entry deterring capacity in (13) depends on which alternative promises the higher profit. Therefore, the domestic firm selects the entry deterring capacity, whenever $\pi_H^{PD} > \pi_H^{PS}$. Comparing both profit functions shows that the incumbent produces the entry deterring quantity for entry barriers z lower than $\tilde{z} =: bq_F^* q_H^*$ (cf. appendix). $q_H^* =: 2Q^n - S$ is the incumbent's output associated with the point at which the reaction function for situations with a binding and a non–binding quantity restriction intersect.

Similar to the situation with no AD–regulation, the AD–strategy chosen by the domestic firm depends on the entrance costs z. Given that the price restriction is binding, the incumbent produces the

entry deterring quantity for low entry barriers, i.e. for $z \in [0, \tilde{z})$. When the entrance costs are higher, i.e. if z lies in the interval $[\tilde{z}, z^B)$. As a firm can never receive a higher profit than the monopoly one and the entrance is blocked for $z \in [z^B, \infty)$, the incumbent produces the monopoly quantity in those situations.

5 Anti–dumping regulations as entry barriers

5.1 The effects of a minimum–price rule

Until now, we accepted the fact that some levels of the normal value are binding and others are ineffective for each entry barrier z. To determine the effects of the AS–regulation, we have to answer the question which levels of the norm quantity and, hence, which normal values are constraining.

In general, the quantity restriction can be regarded as completely ineffective when firms behave as though no AD–regulation exists. This involves two prerequisites: (i) the minimum–price rule has to be physically ineffective and (ii) the normal value has to leave the firms' strategic behaviour unaffected. For a given entry barrier, case (i) requires the norm quantity to be higher than the total quantity supplied in a free–trade situation. Henceforward, we refer to norm quantities satisfying case (i) as physically ineffective ones. However, there may be situations in which the existence of an AD–regulation change the firms' strategic behaviour although the restriction is physically ineffective. Accordingly, case (ii) requires that the firms behave as if no restriction exists. For a given entry barrier, we refer to norm quantities satisfying case (ii) as being strategically ineffective. As a consequence, normal values for which case (i) and (ii) are met, are completely ineffective.

In a free–trade situation, the domestic firm applies three different strategies: behaving as a monopoly, deterring or allowing entry. As the entrance is blocked for high entry barriers, i.e. for $z \in [z^B, \infty)$, the incumbent has a monopoly. The total quantity supplied equals the monopoly output $S/2$. The domestic firm deters entry when $z \in [z^{DL}, z^B)$, so that the total output is equivalent to the entry deterring capacity $S - 2\sqrt{z/b}$. For low entrance costs, i.e. for $z \in [0, z^{DL})$, the incumbent allows entry, so that the total output equals the Stackelberg quantity $3S/4$. Therefore, the norm quantity is physically ineffective if

$$Q^n \in \begin{cases} [3S/4, S) & \text{for } z \in [0, z^{DL}), \\ [S - 2\sqrt{z/b}, S) & \text{for } z \in [z^{DL}, z^B), \\ [S/2, S) & \text{for } z \in [z^B, \infty). \end{cases} \tag{15}$$

It is also worth mentioning that the maximal quantity the incumbent produces to defend the domestic market exceeds the total output in a Stackelberg situation. This can be seen by replacing the entry barrier z by the definition of z^{DL} in equation (7) and noting that $3\sqrt{2}S/4$ is higher than $3S/4$, the Stackelberg quantity. This result suggests that norm quantities $Q^n \geq 3\sqrt{2}S/4$ are ineffective for all levels of the entry barrier. However, it is shown below that this conclusion is misleading as it neglects the second condition being met.

Requirement (ii) refers to the strategic behaviour of both firms. In examining which set of normal values are strategically ineffective for a given entry barrier, we only have to analyse the incumbent's profits. This can be seen by noting that the domestic firm has the first–mover advantage to choose a capacity and, hence, a quantity in the pre–entry period t_1. The foreign firm observes the incumbent's decision and optimally responds. Accordingly, the domestic firm chooses the AD–strategies whenever doing so yields the higher profit than applying the free–trade strategies.

Proposition 5.1. *Let* $z_u^c =: (q_F^*/2)^2$, $z_l^d =: bq_F^*(\sqrt{q_F^*} - \sqrt{S})^2$, $z_l^a =: bq_F^*(S(2-\sqrt{2}) - q_F^*)$, *and* $z_u^a =: bq_F^*(S(2+\sqrt{2}) - q_F^*)$. *Then, the set of entry barriers where the incumbent applies the AD–strategies is given by*

$$z \in \begin{cases} [0, z_u^c) & \text{if} \quad Q^n \in \left[\frac{S}{2}, \frac{S}{8}\left(6 - \sqrt{1+2\sqrt{2}}\right)\right) \\ [0, z_l^d) & \text{if} \quad Q^n \in \left[\frac{S}{8}\left(6 - \sqrt{1+2\sqrt{2}}\right), \frac{S}{4}(2+\sqrt{2})\right) \\ [z_l^a, z_l^d) & \text{if} \quad Q^n \in \left[\frac{S}{4}(2+\sqrt{2}), \frac{S}{8}(6-\sqrt{2}+2^{7/4})\right) \\ [z_l^a, z_u^a) & \text{if} \quad Q^n \in \left[\frac{S}{8}(6-\sqrt{2}+2^{7/4}), S\right) \end{cases} \tag{16}$$

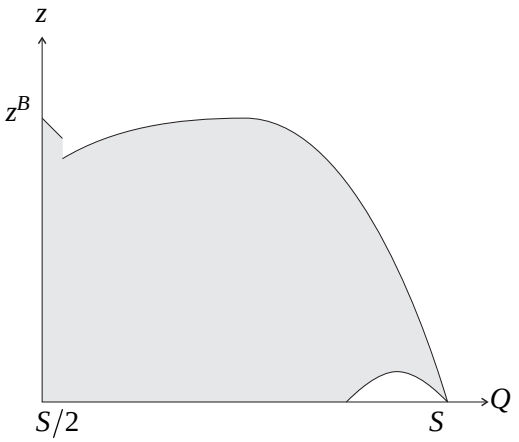

Figure 5.1: Situations with strategically effective AD–rules

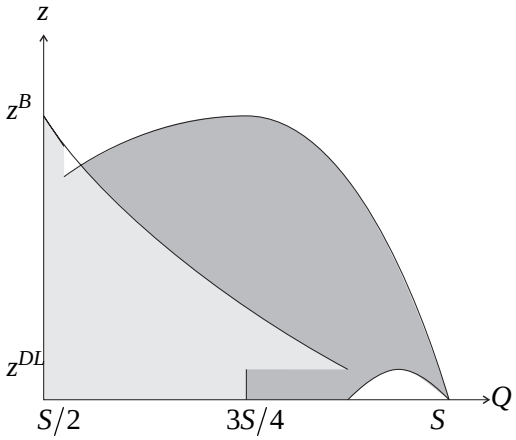

Figure 5.2: Situations with strategically effective but physically ineffective AD–rules

Proof. See appendix. □

This proposition determines the combinations of the entry barrier and the norm quantities which alters the strategic behaviour of the firm in presence of a AD–regulation. The information given in proposition 5.1 is illustrated in figure 5.1. The grey shaded area marks the combinations of z and Q^n where the domestic firm earns higher profits when adopting the AD–strategies. Consequently, the white areas show the combinations of z and Q^n where the incumbent finds it profitable to apply the free–trade strategies. Consequently, those combinations of z and Q^n show where the AD–regulation is strategically ineffective. The white area to the lower right site of the figure shows that market entry occurs for certain norm values.

Proposition 5.1 and, hence, figure 5.1 do not require the norm quantities to be physically ineffective. Using the information given in equation (15) together with the one stated in proposition 5.1 ensues in figure 5.2. Here, the dark grey shaded area displays the combinations of the entry barrier and the norm quantity where the domestic firms chooses the AD–strategies although the minimum–price regulation is physically ineffective. The white areas show combinations of z and Q^n for which the corresponding minimum–price rule proves to be completely ineffective.

The existence of an AD–regulation may also affect the total quantities supplied. When no AD–regulation exists, the total quantity produced is given by

$$Q^F = \begin{cases} \frac{3}{4}S & \text{for} \quad z \in [0, z^{DL}), \\ S - 2\sqrt{\frac{z}{b}} & \text{for} \quad z \in [z^{DL}, z^B). \end{cases} \tag{17}$$

The first line applies whenever the foreign firm enters the market due to low entry barriers and both firms play a Stackelberg game. The second line is associated to situations in which the domestic firm finds it profitable to deter entry. Since the incumbent is a monopoly when $z > z^B$ independent of the existence or non–existence of AD–regulations, we do not consider these cases here. Similarly, we can summarise the total quantities produced whenever the AD–regulation proves to be binding:

$$Q^P = \begin{cases} Q^n - \frac{z/b}{Q_F^*} & \text{for} \quad z \in [0, \tilde{z}), \\ Q^n & \text{for} \quad z \in [\tilde{z}, z^B). \end{cases} \tag{18}$$

We define a situation to be pro–competitive whenever $Q^P > Q^F$.

Proposition 5.2. *Let $z_a = bq_F^*(4Q^n - 3S)$ and z^{DL}, z_l^a, z_u^a be defined as above. Then, the set of entry barriers where the incumbent applies the AD–strategies and a pro–competitive situation is given can be determined with*

$$z \in \begin{cases} [0, z_a) & \text{for} \quad Q^n \in \left[\frac{3}{4}S, \frac{S}{16}\left(14 - \sqrt{2^{5/2} - 2}\right)\right), \\ [0, z^{DL}) & \text{for} \quad Q^n \in \left[\frac{S}{16}\left(14 - \sqrt{2^{5/2} - 2}\right), \frac{S}{4}(2 + \sqrt{2})\right), \\ [z_l^a, z^{DL}) & \text{for} \quad Q^n \in \left[\frac{S}{4}(2 + \sqrt{2}), \frac{S}{8}(6 - \sqrt{2} + 2^{7/4})\right), \\ [z_l^a, z_u^a) & \text{for} \quad Q^n \in \left[\frac{S}{8}(6 - \sqrt{2} + 2^{7/4}), S\right). \end{cases} \tag{19}$$

Proof. See appendix. □

Again, the proposition does not require the minimum–price rule to be physically ineffective. However, it is easy to see that z_u^c and z_u^a have smaller values than z^{DL} in the relevant range of the norm quantities. As a consequence, the combinations of z and Q^n stated in proposition 5.2 refer to situations in which the AD–regulation is physically ineffective. Hence, they describe situations in which no entry occurs although it were possible.

5.2 Discussion

As mentioned above, the maximum quantity that the domestic firm produces to defend the market in absence of an AD–regulation equals $3\sqrt{2}S/4$. This suggests that normal values corresponding to higher norm quantities are completely ineffective for all levels of the entrance costs. However, an immediate result of proposition 5.1 is that there is no normal value in the range $(p^c, p^m]$ which is neither physically nor strategically ineffective for all entry barriers. Reversely stated, every normal value different from the competitive price distorts the market outcome for at least some levels of the entry barrier.

This also implies that reducing the entry barriers for foreign firms is not sufficient to ensure market entrance. It can be illustrated by focussing on the special case of $z = 0$. With no entrance costs for the foreign firm, the incumbent finds it unprofitable to defend the home market in a free–trade situation. He would have to produce the competitive quantity S resulting in zero profits. In contrast, choosing the Stackelberg leader quantity, the incumbent earns a strictly positive profit, so that he allows entry. When an AD–regulation exists, market entry occurs only if the normal value corresponds to norm quantities stated in the two lower lines of equation (16). The lowest norm quantity where market entry is possible, exceeds the total Stackelberg quantity of $3S/4$. As a consequence, even if no market barriers exist, entry occurs only for specific normal values. In addition, these normal values have to be considerably lower than the price in a Stackelberg situation. This implies that even 'innocent' looking minimum prices have an distorting effect on competition.

The propositions also help to determine whether AD–rules facilitate the abuse of market dominance. The abuse of market dominance requires that entrance and consumer's welfare are restricted. In answering this question, it is convenient to distinguish between low–entry–cost situations, i.e. $z \in [0, z^{DL})$, and high–entry–cost ones, i.e. for $z \in [z^{DL}, z^B)$.

Concerning the first prerequisite, figure 5.2 demonstrates that entry is deterred for some normal values although it would be generally allowed in the free–trade regime for the low–entry–cost case. Therefore, it can be concluded that entry deterrence is facilitated for those normal values. In the high–entry–cost cases, entrance is deterred in both regimes. However, the counter–conclusion of proposition 5.2 shows that whenever the normal value is such that the incumbent chooses the AD–strategies, the entry deterring quantity is lower as compared to the free–trade regime. Again, entry deterring is facilitated for those normal values.

All cost intervals specified in proposition 5.2 belong to low–entry–cost cases. Surprisingly, we find a pro–competitive effect increasing the consumer's welfare for most situations in which entry is

deterred under AD–rules but not under free trade as a consequence of this proposition.[11] However, these effects require the normal value to be lower than the free–trade price, i.e. here the one of the Stackelberg situation. In contrast, for the high–entry–cost case, the total quantity produced is lower when the incumbent applies the AD–strategies as compared to the free–trade situation. As a consequence, the domestic firm abuses its dominant position in those situations.

6 Conclusion

In this paper, we have explored the question whether AD–rules facilitate the abuse of market dominance, which requires first that entry is facilitated and second that the incumbent's behaviour is detrimental to consumer welfare.

We have analysed market abuse in a standard Dixit–type model of entry deterrence. The domestic firm may abuse its incumbency under free trade as well as under AD–legislation. In the former situation, the incumbency's ability to abuse its dominance depends on the level of sunk costs. The lower the entrance costs are, the higher is the limit capacity and, hence, the more costly is the deterrence of entry. Hence, if sunk costs are below a critical level, the incumbent has to allow entry.

In the anti–dumping regime, however, the profitability of a deterrence strategy depends on the interplay between the level of sunk costs and the level of the minimum price. We show that even if the minimum price is significantly below the competitive price, the behaviour of the domestic firm is distorted for at least some levels of the entrance costs. However, this not necessarily harms the consumers. In particular, we find a pro–competitive effect increasing the consumer welfare for a combination of low entrance costs and moderate normal values.

For the high–entrance cost case, there is no market entry in both regimes. If entrance costs are not too high, situations may arise where consumers gain by the entry deterring behaviour of the domestic firm. In these cases, it is easier for the incumbent to deter entry in an AD–regime. Consequently, the AD–regime produces an anti–competitive effect. If entrance costs are high, entry deterrence under free trade ensues in a lower consumer welfare. Yet, the total quantity produced is still higher than under AD–protection. Accordingly, AD–rules facilitate the abuse of market dominance.

Our analysis has important implications for the interface between trade policy and competition policy. The current administration of AD–legislation as minimum-price protection is frequently inconsistent with the objective of a competition friendly international trading system, in which both policy fields support each other in maintaining market access and market contestability. We have shown that minimum-price protection not only alters the strategic interactions among actual competitors, but additionally among incumbents and potential competitors. Hereby, even seemingly 'innocent' minimum prices, i.e. minimum prices, which are equal or below the competitive price (i.e. the 'true normal value') distort the behaviour of firms. Hence, our analysis suggests that avoiding undesirable anti-competitive side effects of anti–dumping policy is not only a matter of removing biases and distortions in the calculation of the normal or fair value of the product.

Appendix

Available upon request.

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[11] As proposition 5.2 in combination with figure 5.2 illustrates, there exists a small set of combinations of z and Q^n for which we find a anti–competitive effect.

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