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Anti-Dumping Regulations:
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Abstract

In a Bertrand duopoly model, it is shown that an anti-dumping regulation can be strategically exploited by the domestic firm to reduce the degree of competition in the domestic market. The domestic firm commits not to export to the foreign market which gives the foreign firm a monopoly in its own market. As a result the foreign firm will increase its price allowing the domestic firm to increase its price and its profits. If the products are sufficiently close substitutes then the higher profits in the domestic market are large enough to compensate for the loss of profits on exports.

Keywords: anti-dumping regulations, Bertrand oligopoly, strategic behaviour.
JEL classification: F13, L13.

1. Introduction

While tariffs, import quotas and other barriers to trade have been reduced or eliminated by the WTO/GATT, there has been a proliferation of anti-dumping regulations with more countries using anti-dumping regulations. Prusa (2005) argues that anti-dumping regulations do more harm than the problem of economically harmful predatory dumping that they are supposed to remedy, and that anti-dumping regulations are now just a clever form of protectionism. Anti-dumping regulations were supposed to be a response to anti-competitive behaviour by foreign firms that engaged in predatory dumping to eliminate competition from firms in the home market. The widespread use of anti-dumping regulations and the rarity of instances of predatory dumping suggest that this argument cannot be used to justify anti-dumping regulations. There is now a real risk that anti-dumping regulations are having unintended consequences with them being used strategically by firms in the home market for anti-competitive reasons.

This paper will show how the home firm can strategically use an anti-dumping regulation to lessen competition in the home market by committing not to export to the foreign market. In a Bertrand duopoly model, with differences in the size of the market in the home and foreign country, when there is no anti-dumping regulation both firms compete in both markets and there is no dumping. When there is an anti-dumping regulation the home firm could commit not to export to the foreign market thereby giving the foreign firm a monopoly in the foreign market. Since the anti-dumping regulation prevents the foreign firm from setting a lower price in the home market than in the foreign market, it induces the foreign firm to increase its price in the home market and allowing the home firm to increase its price. Although the home firm gives up its profits from exports to the foreign market if the products are close substitutes then it recoups this loss from the higher profits in the home market. The behaviour of the firm induced by the anti-dumping regulation has an anti-competitive effect in the home market and the welfare of the home country is reduced by the anti-competitive effect and the loss of the profits from exports.

Although the example of strategic use of anti-dumping regulations in this paper is novel, a number of authors have looked at the possible effects of anti-dumping regulations on competition; see: Staiger and Wolak (1992), Prusa (1992, 1994), Webb (1992), Reitzes (1993), Anderson, Schmitt and Thisse (1995), Veugelers and Vandenbussche (1999), Pauwels, Vandenbussche and Weverbergh (2001), and Falvey and Wittayarungruangsri (2006).

2. The Bertrand duopoly model

A home firm and a foreign firm produce differentiated products and compete as Bertrand duopolists in the home and foreign markets as in Clarke and Collie (2003). The two firms have identical and constant marginal cost, and there are no transport costs. The two markets differ in terms of the size of the markets, but the degree of product differentiation and the maximum willingness to pay are the same in both markets. The markets are assumed to be segmented. Given the assumptions of segmented markets and constant marginal cost, each market can be analysed independently of the other market under free trade. Variables relating to the home market will be denoted by a subscript *h* while those relating to the foreign market will be denoted by a subscript *f*, and variables relating to home firm will be denoted by a subscript one while those relating to the foreign firm will be denoted by a subscript two. In the *j*th market, where $j = h, j$, the price set by the home firm is p_{1j} and its sales are x_{1j} while the price set by the foreign firm is p_{2j} and its sales are x_{2j}.

In each market, there is a representative consumer with quasi-linear preferences that are described by a quadratic utility function. The utility function of the representative consumer in the *j*th market is:

$$U_j = \alpha x_{1j} + \alpha x_{2j} - \frac{1}{2}\beta_j\left(x_{1j}^2 + x_{2j}^2 + 2\phi x_{1j}x_{2j}\right) + z_j \qquad j = h, f \tag{1}$$

where z_j is consumption of the numeraire good which is produced by a perfectly competitive industry using constant returns to scale technology. The parameters of the utility function are assumed to satisfy the following conditions: the maximum willingness to pay of consumers exceeds the marginal cost of the firms, $\alpha > c > 0$; and the products of the two firms are imperfect substitutes, $0 \le \phi < 1$. It turns out that ϕ is a key parameter in the model that measures the degree of product substitutability, where $\phi = 1$ means that the products of the two firms are perfect substitutes and $\phi = 0$ means that the two products are independent. The other key parameter turns out to be the size of the foreign market relative to the size of the home market: $\lambda \equiv \beta_h / \beta_f$. Utility maximisation, subject to the budget constraint, yields the inverse demand functions facing the two firms in the *j*th market:

$$p_{1j} = \alpha - \beta_j\left(x_{1j} + \phi x_{2j}\right) \qquad p_{2j} = \alpha - \beta_j\left(\phi x_{1j} + x_{2j}\right) \tag{2}$$

In a Bertrand duopoly, where price is the strategic variable of the firms, the direct demand functions will generally be more useful than the inverse demand functions; inverting (2) yields the direct demand functions in the *j*th market:

$$x_{1j} = \frac{1}{\beta_j\left(1-\phi^2\right)}\left[\alpha\left(1-\phi\right) - p_1 + \phi p_2\right] \qquad x_{2j} = \frac{1}{\beta_j\left(1-\phi^2\right)}\left[\alpha\left(1-\phi\right) + \phi p_1 - p_2\right] \tag{3}$$

These demands show that the size of the *j*th market is proportional to $1/\beta_j$, and therefore $\lambda \equiv \beta_h/\beta_f$ is the size of the foreign market relative to the size of the home market. The profits of the two firms from sales in the *j*th market are:

$$\pi_{1j} = \left(p_{1j} - c\right)x_{1j} \qquad\qquad \pi_{2j} = \left(p_{2j} - c\right)x_{2j} \tag{4}$$

Under free trade, there is a Bertrand duopoly in both markets with the two firms independently and simultaneously setting prices to maximise profits; hence, assuming there is an interior solution where both firms sell positive quantities, the first-order conditions for the Bertrand equilibrium in the *j*th market are:

$$\begin{aligned} \frac{\partial \pi_{1j}}{\partial p_{1j}} &= \frac{1}{\beta_j\left(1-\phi^2\right)}\left[\alpha\left(1-\phi\right) - 2p_{1j} + \phi p_{2j} + c\right] = 0 \\ \frac{\partial \pi_{2j}}{\partial p_{2j}} &= \frac{1}{\beta_j\left(1-\phi^2\right)}\left[\alpha\left(1-\phi\right) + \phi p_{1j} - 2p_{2j} + c\right] = 0 \end{aligned} \tag{5}$$

These first-order conditions can be rearranged to give the best-reply functions of the home and the foreign firm in the *j*th market:

$$p_{1j} = b_{1j}\left(p_{2j}\right) \equiv \frac{1}{2}\left[\alpha\left(1-\phi\right) + c + \phi p_{2j}\right] \qquad p_{2j} = b_{2j}\left(p_{1j}\right) \equiv \frac{1}{2}\left[\alpha\left(1-\phi\right) + c + \phi p_{1j}\right] \tag{6}$$

Figure one shows the Bertrand duopoly best-reply functions of the two firms, and allows for the possibility of boundary solutions where one firm has zero sales; see Clarke and Collie (2003) for further explanation of the best-reply functions. The intersection of the two best-reply functions, labelled as B in figure one, gives the prices of the two firms in the symmetric Bertrand equilibrium under free trade in the *j*th market:

$$p_{1j}^B = p_{2j}^B = \frac{\alpha\left(1-\phi\right) + c}{2-\phi} \tag{7}$$

Note that since the Bertrand equilibrium prices do not depend upon the market size parameter β_j, prices will be the same in both markets so there is no dumping under free trade. Substituting these prices (7) into the direct demand functions (3) yields the sales of the two firms in the Bertrand equilibrium under free trade:

$$x_{1j}^B = x_{2j}^B = \frac{\alpha - c}{\beta_j (2-\phi)(1-\phi)} \tag{8}$$

Using these prices (7) and quantities (8) in (4) yields the profits of the two firms in the Bertrand equilibrium under free trade:

$$\pi_{1j}^B = \pi_{2j}^B = \frac{(1-\phi)(\alpha - c)^2}{\beta_j (2-\phi)^2 (1+\phi)} \tag{9}$$

Note that the sales and profits of the two firms in each market do depend upon the market size parameter, β_j.

The welfare of the home country is given by the sum of consumer surplus, the profits of the home firm in the home market, π_{1h}, and the profits of the home firm from exports to the foreign market, π_{1f}. Given the quadratic utility function, consumer surplus in the home country is $CS_h = U_h - p_{1h}x_{1h} - p_{2h}x_{2h} - z = \beta_h \left[x_{1h}^2 + x_{2h}^2 + 2\phi x_{1h}x_{2h} \right] / 2$. Thus, the welfare of the home country is:

$$W_h = \frac{\beta_h}{2} \left[x_{1h}^2 + x_{2h}^2 + 2\phi x_{1h}x_{2h} \right] + \pi_{1h} + \pi_{1f} \tag{10}$$

Substituting (8) and (9) into (10) yields the welfare of the home country under free trade:

$$W_h^B = \frac{(\alpha - c)^2}{\beta_h (2-\phi)(1+\phi)} + \pi_{1f}^B \tag{11}$$

The first term is the sum of consumer surplus and the profits of the home firm in the home market while the second term is the profits of the home firm from exports to the foreign market. These results under free trade will be used as a benchmark in the analysis of the effects of an anti-dumping regulation in the next section.

3. Anti-Dumping Regulation

This section analyses the export decision of the home firm in the presence of an anti-dumping regulation imposed by the home government that instantaneously levies a duty on the foreign firm if it dumps its product in the home market (i.e. it sets a lower price in the home market than in the foreign market). The anti-dumping duty is set equal to the dumping margin, which is defined as the difference in price of the foreign product between the foreign and the home market. Faced with such an anti-dumping regulation, the foreign firm will never dump in the home market as it is always more profitable to increase the price it sets in the home market to avoid the anti-dumping duty. Thus, the anti-dumping regulation deters the foreign firm from practising price discrimination between the home and foreign markets, and alters the game played by the two firms.

The formal structure of the two stage game is as follows: At the first stage of the game, the home firm decides whether or not to export to the foreign market. At the second stage, if the home firm decides to export, then there is a subgame where the two firms compete in the home and foreign markets. If the home firm decides not to export, then there is a subgame where the foreign firm has a monopoly in the foreign market while the two firms compete in the home market with the anti-dumping regulation deterring the foreign firm from setting a lower price in the home market than in the foreign market. As usual the game is solved by backwards induction to obtain a subgame perfect equilibrium.

In the subgame, where the home firm has decided to export to the foreign market, the foreign firm will not want to price discriminate between the two markets. Therefore, the outcome will be as in the Bertrand duopoly equilibrium described in the previous section. In both markets, the prices are given by (7), the sales by (8) and the profits by (9). Thus, the total profits of the home firm from the two markets are $\pi_{1h}^{B} + \pi_{1f}^{B}$. The anti-dumping regulation does not alter the outcome of the subgame when the firms simultaneously and independently set prices in both markets.

In the subgame, where the home firm has decided not to export to the foreign market, the foreign firm will have a monopoly in the foreign market while competing in a Bertrand duopoly with the home firm in the home market, and the home government's anti-dumping regulation will deter the foreign firm from setting a lower price in the home market than in the foreign market. The foreign firm can either set a price higher than the Bertrand duopoly price and sell in both markets or set the monopoly price and sell only in the foreign market. This will affect competition between the two firms in the domestic market as it will alter the best-reply function of the foreign firm.

Since the foreign firm has a monopoly in the foreign market, its demand curve is found by setting $x_{1f} = 0$ in its inverse demand function (2), and inverting to obtain $x_{2f} = \left(\alpha - p_{2f}\right)/\beta_f$. In the home market, the foreign firm competes with the home firm in a Bertrand duopoly so its demand is given by its inverse demand function (3). As the anti-dumping regulation prevents the foreign firm from setting a lower price in the home market than in the foreign market, it must set the same price in both markets so $p_{2f} = p_{2h} = p_2$. The total profits of the foreign firm are the sum of its profits from the foreign market and its profits from the home market:

$$\Pi_2 = \pi_{2f} + \pi_{2h} = \left(p_2 - c\right)\left(\frac{\alpha - p_2}{\beta_f} + \frac{1}{\beta_h\left(1-\phi^2\right)}\left[\alpha\left(1-\phi\right) + \phi p_{1h} - p_2\right]\right) \tag{12}$$

Assuming there is an interior solution where the foreign firm sells positive quantities in both markets and the home firm sells a positive quantity in the home market, then the first order condition for profit maximisation by the foreign firm is:

$$\frac{\partial \Pi_2}{\partial p_2} = \frac{\alpha - 2p_2 + c}{\beta_f} + \frac{1}{\beta_h\left(1-\phi^2\right)}\left[\alpha\left(1-\phi\right) + \phi p_{1h} - 2p_2 + c\right] = 0 \tag{13}$$

The first term is the marginal effect on profits of a price increase in the foreign market and the second term is the marginal effect on profits of a price increase in the home market. The first term is positive as the foreign firm could increase its profits in the foreign market by raising its price, while the second term is negative as the foreign firm could increase its profits in the home market by reducing its price. Solving (13) yields the profit-maximising price of the foreign firm as a function of the price set by the home firm in the home market:

$$p_2 = a_2\left(p_{1h}\right) \equiv \frac{1}{2}\left[\alpha + c - \frac{\left(\alpha - p_{1h}\right)\phi\beta_f}{\beta_f + \beta_h\left(1-\phi^2\right)}\right] \tag{14}$$

where $a_2\left(p_{1h}\right)$ is the best-reply function of the foreign firm when there is an interior solution.

Alternatively, there may be a boundary solution where the sales of the foreign firm in the home market are zero. Then, the foreign firm will set the monopoly price in both markets, $p_2 = p_{2f}^M = \left(\alpha + c\right)/2$, sell the monopoly output in the foreign market, $x_{2f}^M = \left(\alpha - c\right)/2\beta_f$, but sell zero in the home market, and earn monopoly profits in the foreign market, $\pi_{2f}^M = \left(\alpha - c\right)^2/4\beta_f$. The foreign firm will compare the profits from selling in both markets, which depends upon the price set by the home firm, with the profits from setting the monopoly price and selling zero in the home market, and then choose the most profitable option.

The best-reply functions of the two firms are shown in figure two. When the home firm sets a low price in the home market, $p_{1h} < p_{1h}^{*}$, the best response of the foreign firm is to set the monopoly price in which case its sales in the home market will be zero. When the home firm sets a high price in the home market, $p_1 > p_1^{*}$, the best-reply function of the foreign firm is given by $p_2 = a_2\left(p_{1h}\right)$. The best-reply function of the home firm is unchanged by the anti-dumping regulation. Assuming that the intersection of the two best-reply functions occurs to the right of the discontinuity in the foreign best-reply function at p_1^{*}, there will be a pure strategy Nash equilibrium that is given by the intersection of the best-reply function of the home firm, $p_{1h} = b_{1h}\left(p_2\right)$ from (6), and the best-reply function of the foreign firm, $p_2 = a_2\left(p_{1h}\right)$ from (14). Solving for the pure strategy Nash equilibrium prices yields:

$$\begin{aligned} p_{1h}^{D} &= \frac{1}{\Delta}\left[\alpha\left(1-\phi\right)\left[\beta_f\left(2+\phi\right)+\beta_h\left(2+\phi-\phi^2\right)\right]+c\left(2+\phi\right)\left[\beta_f+\beta_h\left(1-\phi^2\right)\right]\right] \\ p_2^{D} &= \frac{1}{\Delta}\left[\alpha\left(1-\phi\right)\left[\beta_f\left(2+\phi\right)+2\beta_h\left(1+\phi\right)\right]+c\left[\beta_f\left(2+\phi\right)+2\beta_h\left(1-\phi^2\right)\right]\right] \end{aligned} \tag{15}$$

where $\Delta \equiv 4\left(\beta_f+\beta_h\right)\left(1-\phi^2\right)+3\beta_f\phi^2 > 0$ and the superscript D denotes the pure-strategy Nash equilibrium with the anti-dumping regulation. Substituting these equilibrium prices into the demand functions (3) yields the sales of the home firm in the home market and the sales of the foreign firm in two markets:

$$x_{1h}^{D}=\frac{(\alpha-c)}{(1+\phi)\Delta}\left[\beta_f(2+\phi)+\beta_h\left(2+\phi-\phi^2\right)\right]$$

$$x_{2h}^{D}=\frac{(\alpha-c)}{(1+\phi)\Delta}\left[\beta_f(2+\phi)+\beta_h\left(2-3\phi^2-\phi^3\right)\right] \tag{16}$$

$$x_{2f}^{D}=\frac{(\alpha-c)}{\beta_f\Delta}\left[\beta_f(2+\phi)+\beta_h\left(1-\phi^2\right)\right]$$

Substituting these equilibrium prices and sales into profits (4) yields the profits of the home firm from the home market and the total profits of the foreign firm from the two markets with the anti-dumping regulation:

$$\pi_{1h}^{D}=\frac{(\alpha-c)^2}{\beta_h(1+\phi)\Delta^2}\left[\beta_f(2+\phi)+\beta_h\left(2+\phi-\phi^2\right)\right]^2$$

$$\Pi_2^D=\pi_{2h}^D+\pi_{2f}^D=\frac{(\alpha-c)^2}{\beta_f\beta_h(1+\phi)\Delta^2}\left[\beta_f(2+\phi)+2\beta_h(1+\phi)\right]^2 \tag{17}$$

In this Nash equilibrium, labelled as D in figure two, both firms set a higher price than in the symmetric free-trade Bertrand equilibrium, labelled as B in figure two, and the foreign firm clearly sets a higher price than the domestic firm since D is above the diagonal. There will only be a pure strategy Nash equilibrium if it is more profitable for the foreign firm to sell in both markets rather than being a monopolist selling only in the foreign market. This will be the case if the size of the foreign market relative to the size of the home market is less than some critical value: λ^P, where this critical value is obtained by solving $\Pi_2^D=\pi_{2f}^M$, which yields:

$$\lambda^P=\frac{-32+52\phi^2+12\phi^3-11\phi^4-3\phi^5\pm\sqrt{3}(1+\phi)\phi^2\sqrt{(2+\phi)^3(-2+3\phi)}}{16(1+\phi)^2\left(2-4\phi+\phi^2+\phi^3\right)} \tag{18}$$

At the first stage of the game, the home firm decides whether or not to export to the foreign market. If it decides to export then the home firm will earn the Bertrand equilibrium profits in both markets, $\pi_{1h}^{B}+\pi_{1f}^{B}$, whereas if it decides not to export then it will earn higher profits in the domestic market, π_{1h}^{D} but zero profits in the foreign market. Hence, the home firm will decide not to export to the foreign market if $\pi_{1h}^{D}>\pi_{1h}^{B}+\pi_{1f}^{B}$. This will be the case if the size of the foreign market relative to the size of the home market is larger than some critical value: λ^{π}, where this critical value is obtained by solving $\pi_{1h}^{D}=\pi_{1h}^{B}+\pi_{1f}^{B}$, which yields:

$$\lambda^{\pi}=\frac{-32+32\phi+16\phi^{2}-8\phi^{3}-7\phi^{4}+\phi^{5}-\phi^{3}\sqrt{(1+\phi)\left(-32+48\phi-15\phi^{2}+\phi^{3}\right)}}{32(1+\phi)(1-\phi)^{2}} \tag{19}$$

The two critical values for the size of the foreign market relative to the size of the home market are plotted in figure three. There will be a pure-strategy Nash equilibrium if $\lambda<\lambda^{P}$ and it will be profitable for the home firm to choose not to export to the foreign market if $\lambda>\lambda^{\pi}$. This leads to the following proposition:

Proposition 1: *There will be a pure-strategy Nash equilibrium in prices if* $\lambda<\lambda^{P}$, *and the home firm chooses not to export to the foreign market if* $\lambda>\lambda^{\pi}$.

By choosing not to export to the foreign market, the home firm gives the foreign firm a monopoly in the foreign market and the anti-dumping regulation prevents the foreign firm from price discriminating between the two markets. As a result, the foreign firm will set a higher price in the home market than under free trade and this will increase the profits of the home firm in the home market. From figure three it can be seen that choosing not to export to the foreign market will be profitable for the home firm when the products are close substitutes. When products are close substitutes, competition is intense under free trade and lessening competition by choosing not to export to the foreign market is profitable for the home firm. Note that the foreign market has to be small relative to the home market to ensure that a pure-strategy Nash equilibrium exists, but the products being close substitutes is most important for choosing not to export to be profitable for the home firm.

The effect of the anti-dumping regulation is to increase the prices of both firms in the home market. The effect on the sales of the two firms in the home market can be obtained by subtracting (8) from (16), which yields:

$$x_{1h}^D - x_{1h}^B = \frac{(\alpha - c)\phi^2}{(2-\phi)\Delta} > 0 \qquad x_{2h}^D - x_{2h}^B = -\frac{(\alpha - c)(2-\phi^2)}{(2-\phi)\Delta} < 0 \tag{20}$$

In the home market, the anti-dumping regulation increases the sales of the home firm and decreases the sales of the foreign firm. With the anti-dumping regulation, the home firm no longer exports to the foreign market and therefore the effect of the anti-dumping regulation on the total sales of the home firm in the two markets is:

$$x_{1h}^D - \left(x_{1h}^B + x_{1f}^B\right) = -\frac{(\alpha - c)}{\beta_f (1+\phi)(2-\phi)\Delta}\left[\beta_f\left(4 - 2\phi^2 - \phi^3\right) + 4\beta_h\left(1-\phi^2\right)\right] < 0 \tag{21}$$

Hence, although there is an increase in the sales of the home firm in the home market and the profits of the home firm, the loss of the export sales in the foreign market means that there is a decrease in the total sales of the home firm.

The welfare of the home country with the anti-dumping regulation is obtained by substituting sales (16) and profits (17) into welfare (10), and this yields:

$$\begin{aligned} W_h^D = \frac{(\alpha - c)^2}{2\beta_h(1+\phi)\Delta^2}\Big[& 2\beta_f^2(2+\phi)^2(2-\phi) + \beta_h^2(1-\phi)(1+\phi)^2\left(16 - 12\phi - \phi^2\right) \\ & + \beta_f\beta_h\left(1-\phi^2\right)(2+\phi)(8-\phi)\Big] \end{aligned} \tag{22}$$

The effect of the anti-dumping regulation on the welfare of the home country is obtained by subtracting welfare under free trade (11) from welfare with the anti-dumping regulation:

$$W_h^D - W_h^B = -\frac{(\alpha - c)^2 (1-\phi)\phi}{2(2-\phi)\Delta^2} J - \pi_{1f}^B < 0 \tag{23}$$

where $J \equiv 2\beta_f \left(4-\phi^2\right) + \beta_h (1+\phi)\left(8-10\phi-\phi^2\right)$. Note that when $\phi = 1$, $J = 6\left(\beta_f - \beta_h\right) > 0$, since $\lambda \equiv \beta_h / \beta_f < 1$ when there is a pure-strategy Nash equilibrium, and its derivative $\partial J/\partial\phi = -\left[4\beta_f \phi + \beta_h \left(2+22\phi+3\phi^2\right)\right] < 0$ for $\phi \geq 0$, hence $J > 0$ for $\phi \in [0,1]$. Therefore, both the first and the second term in (23) are negative so the welfare effect of the anti-dumping regulation is unambiguously negative. This leads to the following proposition:

Proposition 2: *When there exists a pure-strategy Nash equilibrium, $\lambda < \lambda^P$, and the home firm chooses not to export to the foreign market, $\lambda > \lambda^\pi$, the anti-dumping regulation will have an unambiguously negative effect on the welfare of the home country.*

The first term in (23) is the *anti-competitive* effect of the anti-dumping regulation on the sum of consumer surplus and the profits of the home firm in the home market. Although the anti-dumping regulation increases the sales of the home firm in the home market, any positive profit-shifting effect is more than offset by the negative effect on consumers of the higher prices set by the home firm and the foreign firm. The second term is the *anti-export* effect of the anti-dumping regulation on profits from exports to the foreign market. Since the anti-dumping regulation leads the home firm not to export to the foreign market, this effect is equal to the loss of profits from exporting to the foreign market under free trade.

4. Conclusions

This paper has demonstrated the possibility that a firm may strategically exploit an anti-dumping regulation to reduce competition in its home market in a situation where dumping would not occur without the strategic behaviour of the firm. By committing not to export to the foreign market, the home firm gives the foreign firm a monopoly in the foreign market and an incentive to increase its price in the foreign market. However, the anti-dumping regulation prevents the foreign firm from dumping in the home market so it has to set the same price in both markets. Hence, the foreign firm will be induced to increase its price in the home market thereby lessening competition with the home firm and allowing the home firm to increase its profits if the products of the two firms are close substitutes. The welfare effect of the home firm strategically committing not to export to the foreign market is unambiguously negative due to the anti-competitive effect in the home market and the loss of profits from exports to the foreign market. This shows that anti-dumping regulations may have effects on trade and competition even when there is no complaint about dumping and no anti-dumping duties. Even modern mercantilists may be concerned by the loss of profits from exports to the foreign market as a result of the anti-dumping regulation.

The paper has only considered the pure-strategy Nash equilibrium of the game between the two firms in the presence of the anti-dumping regulation. This exists provided the foreign market is small relative to the size of the home market. Otherwise there will be a mixed-strategy Nash equilibrium but, as the objective of this paper is to show the possibility of strategic behaviour by the home firm, the mixed-strategy Nash equilibrium has not been analysed as the possibility of strategic behaviour by the home firm can be shown most clearly in the pure-strategy Nash equilibrium.

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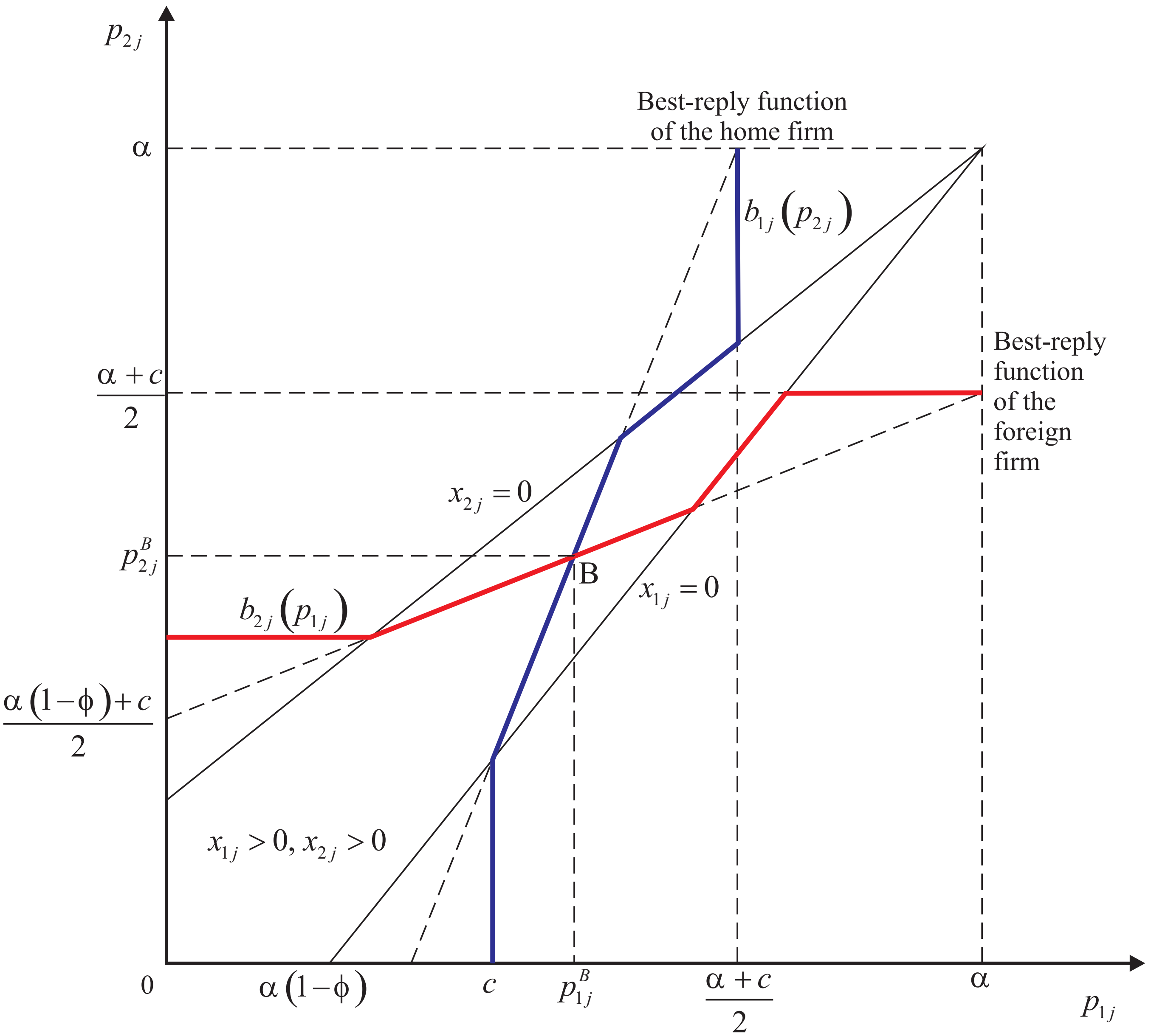

Figure One: Bertrand duopoly reaction functions

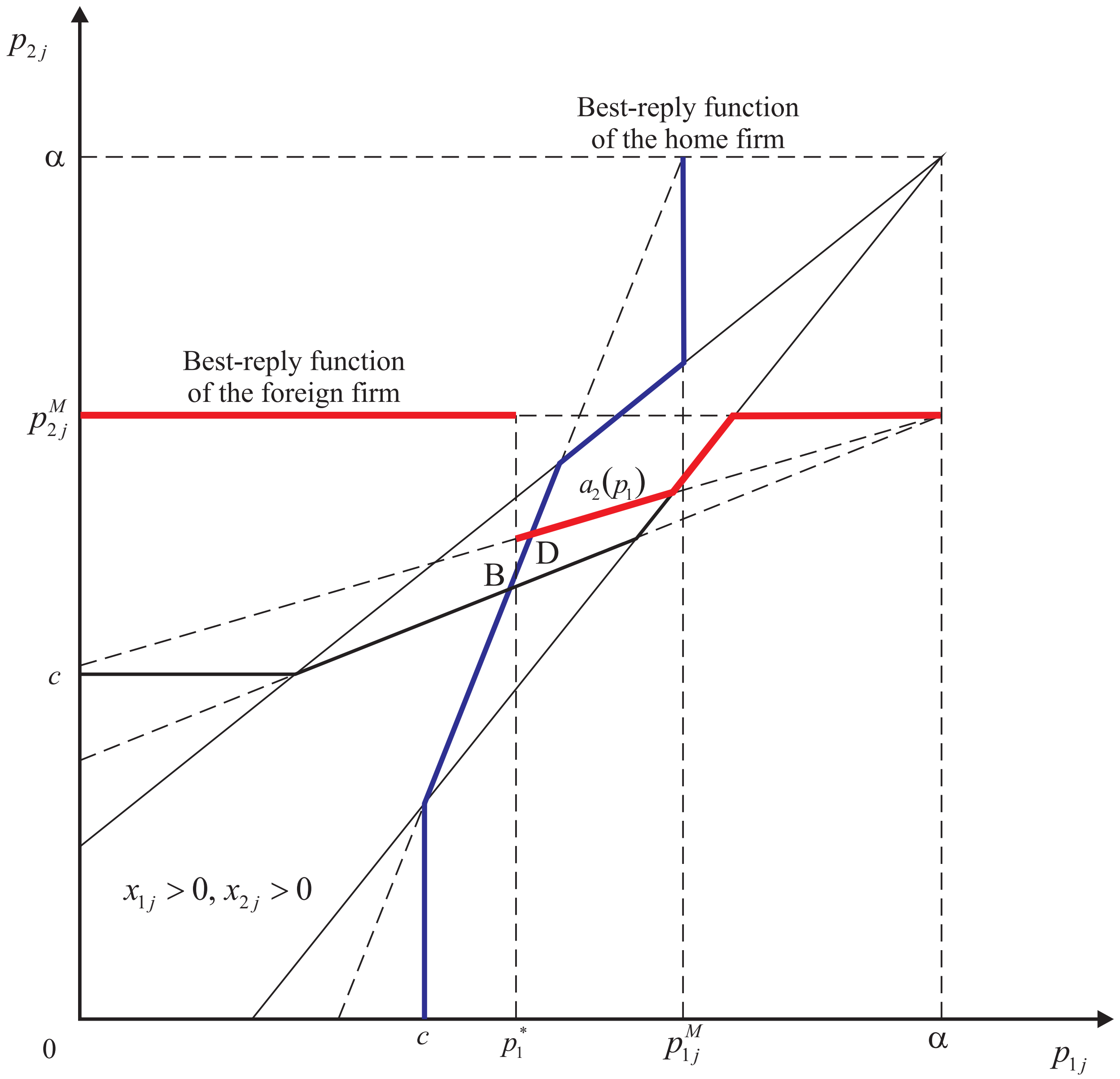

Figure Two: Pure strategy Nash equilibrium

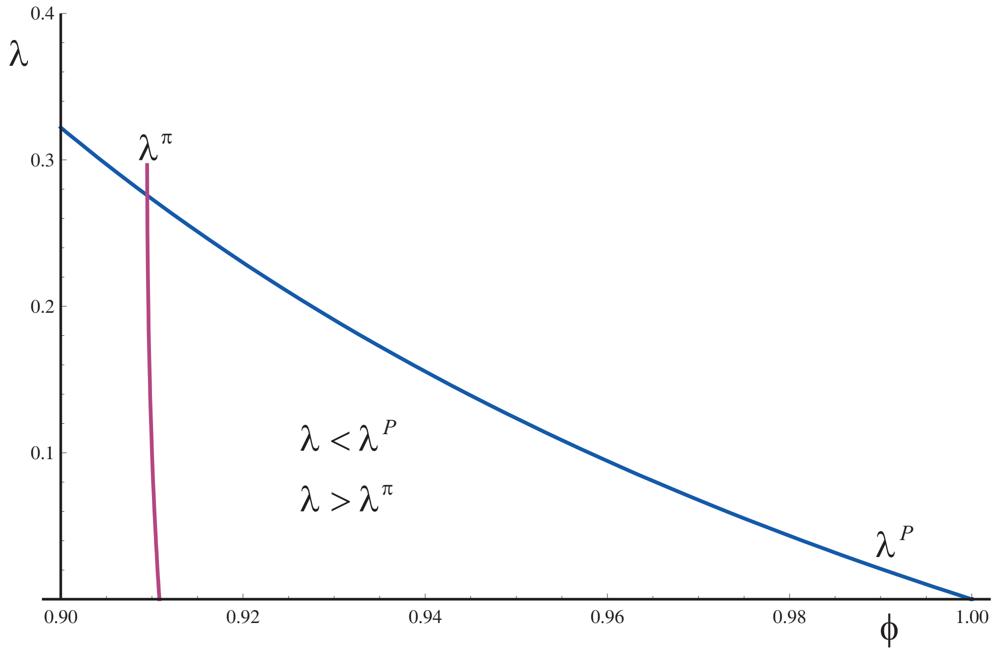

Figure 3: Critical values for pure-strategy Nash equilibrium