The Effects of Entry in Oligopolistic Trade with Bargained Input Prices

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Abstract

Import-competing firms are conventionally seen as protectionist. We show that this may not necessarily be the case when input prices are endogenous. In a framework where the input price is determined through the bargaining between (downstream) firms and (upstream) input suppliers in the domestic market, the relationship between profits-per-firm and the number of foreign entrants depends on trade costs (or transport costs). If trade costs are sufficiently high, then an increase in the number of foreign entrants can raise the profits of the downstream domestic firm in the domestic market. The intuition for this result is that increased product market competition through the entry of foreign firms is mirrored by profit-enhancing moderation of input prices in the domestic market through the bargaining with the upstream input supplier. We further demonstrate an enhanced willingness to accommodate entry in the presence of a bias towards domestically produced goods and a Stackelberg first-mover advantage on the part of the domestic downstream firm.

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1 Introduction

In the standard Cournot model of oligopoly, each firm's profits decrease as the number of firms competing in the product market increases (Seade, 1980). In a model of trade, this implies that a domestic import-competing firm would have an unambiguous incentive to deter rather than accommodate foreign competition. In this paper, we show that when a firm's costs are determined endogenously through the bargaining between (downstream) firms and (upstream) input suppliers in the domestic market, then the relationship between profits-per-firm and the number of foreign entrants depends on trade costs (or transport costs). If trade costs are sufficiently high, then an increase in the number of foreign entrants can raise the profits of the downstream domestic firm in the domestic market. The intuition for this result is that increased product market competition through the entry of foreign firms is mirrored by profit-enhancing moderation of input prices in the domestic market through the bargaining with the upstream input supplier. In other words, the upstream input supplier (which could be a profit-maximising firm or a utility-maximising labour union) is bearing part of the cost of foreign entry, such that the downstream firm may in fact benefit from entry. When trade costs are sufficiently high, the profit-reducing effect of entry via the product price is lower relative to the profit-enhancing effect stemming from the impact of entry on the input price.

One implication of our result is that downstream firms in vertical markets do not necessarily have incentives to deter entry from abroad: for example, the profits of a downstream firm can be greater under Cournot competition with a foreign entrant than when import protection gives it a domestic monopoly. The trade literature has identified many channels through which domestic firms can benefit from trade. These channels, however, rely on a firm's ability to experience a more-than proportionate increase in export profits to compensate for the losses incurred in the domestic market. To the best of the authors' knowledge, the finding of the present paper, which implies that a firm may raise its profits in the domestic market irrespective of the level of exports, is novel. Thus, the model identifies a mechanism to counter that analysed in the classic model of Protection for Sale (Grossman and Helpman, 1994). In that model, import-competing firms pay campaign contributions to the incumbent government to obtain trade protection, which limits the degree of foreign competition in the domestic market. In contrast, it is possible in our framework that a domestic downstream firm will have an incentive to lobby its government to grant more import licenses to foreign competitors in order to raise its own profits. The upstream firm (or labour union) will have the Grossman-Helpman incentive to lobby for protection, implying potentially conflicting interests within the industry.

We model our demand function to allow for consumer preferences that are biased towards the consumption of domestic goods. Our result is strengthened when the home bias is stronger. Hence, a greater home bias may be associated with a greater willingness on the part of domestic firms to accommodate foreign competition. We also extend the basic model of Cournot competition, and show that if an incumbent firm has a first-mover

advantage in the Stackelberg sense, our result is strengthened: any marginal benefit of entry is greater if the incumbent firm, post entry, is able to act as a Stackelberg leader. Hence, in our framework, Stackelberg leadership may be associated with an enhanced willingness to accommodate foreign competition.

Our finding that a firm's profit might increase with the number of firms can also arise in different environments. Recently, Matsushima and Mizuno (2012) consider a simple Cournot model where downstream firms engage in process R&D. They find that the profits of upstream input suppliers may increase with entry since more upstream suppliers leads downstream firms to engage in more R&D, correctly anticipating a fall in the input price which comes about from entry in the upstream market. Mukherjee and Zhao (2009) have shown that profits of some incumbent firms may increase if they are cost efficient relative to other incumbent firms and relative to Stackelberg followers.[1] Their finding is, unlike ours, independent of the vertical structure.[2] Naylor (2002) shows conditions under which industry profits are increasing with the number of firms in the market, but does not address the issue of the individual firm's profit level. It is less surprising that industry profits can increase with the number of firms as such a result which is anyway consistent with falling profits-per-firm. In the related literature on vertically integrated oligopoly, Dowrick (1989) develops a framework in which unions act as the upstream agent and shows how the bargained wage varies with market size, but does not focus on the relationship between profits and the number of firms. Horn and Wolinsky (1988) examine a differentiated oligopoly with upstream agents (unions) and downstream firms, but assume a duopolistic market.[3] In the literature on unions and entry deterrence, the usual approach builds on Williamson's (1968) insight that incumbent firms might collude with unions to enforce industry-wide wage premia in order to deter entry. Unions are seen as an employer instrument to preserve product market power. In the model we outline below, it emerges that in the presence of unions firms might have reduced incentives to deter entry: indeed, in contrast to the Williamson insight, unions might have a pro-competitive impact within an imperfectly competitive product market. In a related literature, Bughin (1999) compares firms' and unions' preferences over bargaining scope and finds that entry deterrence is an influence on the choice of bargaining agenda.

The rest of this paper is organised as follows. In Section 2, we outline the basic model and in Section 3 we examine how firms' profits vary with the number of firms. Section 4 augments the basic model to the case of a Stackelberg leader. Section 5 closes the paper with conclusions and further remarks.

[1] The requirements for their result to hold are rather specific. In fact, all of the following must be satisfied: there must be a large number of cost inefficient incumbents relative to cost efficient incumbents and entrants, and the cost difference between the incumbents, and that between the efficient incumbents and entrants must also be large.

[2] Similar papers which demonstrate a positive relationship between firm profits and entry due to a vertical structure include: Tyagi (1999), Matsushima (2006) and Mukherjee et al. (2009).

[3] Similarly, Naylor (1999) considers unionised oligopoly in the context of international trade and economic integration, but does not allow the number of firms to vary.

2 The model

We model an upstream profit-maximising input-supplier, bargaining with a downstream firm over the price of an input. The two firms are located in country h. If we assumed autarky, the domestic market would be characterised as a situation of bilateral monopoly. However, we assume instead that the downstream firm competes against n symmetric entrants from Rest of the World (RoW). For convenience, we assume that foreign firms do not have to bargain with input suppliers and will just have to pay the competitive RoW input price and an iceberg trade cost. The existence of the domestic bargaining relationship generates the possibility that the domestic upstream firm can set an input price greater than the RoW level. This set-up seems particularly relevant for relatively small countries with domestic markets which do not support intense product market competition or for relatively affluent countries with high wage or other input costs. In the first stage (the bargaining game), the downstream home firm bargains over the input price with the upstream firm. In the second stage (the Cournot product market game), the downstream home firm and the n foreign entrants set their output choices – given the pre-determined input price of the home firm from Stage 1 – to maximise profits. We proceed by backward induction.

(i) *Stage 2: the product market game*

In our model, it is possible that the domestic downstream firm enjoys a home advantage, whereby domestic consumers are biased towards the domestic product. We model this by letting the intercept of the inverse demand function depend on the location of the firm. Hence, let the inverse demand functions for, respectively, the home firm and the potential foreign firms be given as:

$$p_h = a_h - bQ; \tag{1}$$

$$p_f = a_f - bQ. \tag{2}$$

where $Q = q_h + \sum_{j=1}^{n} q_j$ is the aggregate output, q_h is the output of the incumbent home firm, and $\sum_{j=1}^{n} q_j$ is the aggregate output of foreign firms $j = 1, .., n$. The profits of the incumbent firm, and those of foreign firm i, respectively, can be written as:

$$\pi_h = \left[a_h - b\left(q_h + \sum_{j=1}^{n} q_j \right) - c_h \right] q_h; \tag{3}$$

$$\pi_i = \left[a_f - b\left(q_h + \sum_{j=1}^{n} q_j \right) - c_i - \tau \right] q_i. \tag{4}$$

c_h is the input price, which results from the bargaining between the upstream and downstream firm in country h, c_i is the input price incurred by foreign firm i, and τ is an iceberg trade cost[4] faced by foreign

[4]Trade costs may include such things as transport technology, storage, inventory and preparation technology, communications networks, language barriers, import tariffs and so on.

firms. Under the Cournot-Nash assumption, differentiation of (3) and (4), respectively, yield the first-order conditions for profit maximisation of the incumbent and the foreign entrants, from which it is straightforward to derive their corresponding best-reply functions. We have:

$$q_h = \frac{1}{2b}\left[a_h - c_h - b\sum_{j=1}^{n} q_j\right]; \tag{5}$$

$$q_i = \frac{1}{2b}\left[a_f - c_i - b\left(q_h + \sum_{\substack{j=1 \\ j\neq i}}^{n} q_j\right)\right]. \tag{6}$$

Because of the assumption that foreign firms do not have to negotiate with an input supplier, these firms just pay the competitive price of the input which is equal to the true cost of producing it.[5] We denote this as $\overline{c}$. Hence, we have $c_i = \overline{c}\ \forall\ i$. Using this, and solving across $n+1$ first-order conditions gives the following expressions for output in sub-game perfect equilibrium:

$$q_h = \frac{(a_h - c_h)(n+1) - na_f + n(\overline{c}+\tau)}{b(n+2)}; \tag{7}$$

$$q_i = \overline{q} = \frac{2a_f - (a_h - c_h) - 2(\overline{c}+\tau)}{b(n+2)}. \tag{8}$$

It is useful to express the profits of all firms in terms of a vector of their input prices. Substituting (7) and (8), respectively, into (3) and (4) yields:

$$\pi_h = \frac{\left[(a_h - c_h)(n+1) - na_f + n(\overline{c}+\tau)\right]^2}{b(n+2)^2}; \tag{9}$$

$$\pi_i = \overline{\pi} = \frac{\left[2a_f - (a_h - c_h) - 2(\overline{c}+\tau)\right]^2}{b(n+2)^2}. \tag{10}$$

(ii) *Stage 1: the bargaining game*

The profits of the domestic input supplier can be written as:

$$\pi_h^I = (c_h - \overline{c})\, q_h, \tag{11}$$

where $\overline{c}$ denotes the marginal cost of the input, which is assumed to be the same across countries. We assume Nash bargaining of the input prices. The maximand for the bilateral monopoly home firm pair is:

$$B_h = \left(\pi_h^I\right)^{\beta} (\pi_h)^{1-\beta} \tag{12}$$

where we assume that disagreement pay-offs are zero. β represents the input supplier's Nash bargaining power in the asymmetric input price bargain. Substituting (7) into (11), then substituting the resulting expression as well as (9) into (12) yields:

$$B_h = \frac{1}{b(n+2)^{2-\beta}}(c_h - \overline{c})^{\beta}\left[(a_h - c_h)(n+1) - na_f + n(\overline{c}+\tau)\right]^{2-\beta}; \tag{13}$$

[5] Naylor (1999) considers a situation in which both domestic and foreign firms bargain over input prices with respective upstream suppliers, but without considering the effects of entry on the downstream firm's profits.

Maximising (13) with respect to c_h and solving yield:

$$c_h = \overline{c} + \frac{(a_h - \overline{c} + n\tau + n(a_h - a_f))\beta}{2(n+1)}; \tag{14}$$

Substituting (14) into respectively (7) and (8) yields the following outputs in equilibrium:

$$q_h = \frac{(2-\beta)(a_h - \overline{c} + n\tau) + n(a_h - a_f)}{2b(n+2)}; \tag{15}$$

$$\overline{q} = \frac{(a_f - \tau)[4(n+1) - \beta n] - a_h[(2-\beta)(n+1)] - \overline{c}[\beta + 2(n+1)]}{2b(n+1)(n+2)}. \tag{16}$$

The resulting profits are:

$$\pi_h = \frac{[(2-\beta)(a_h - \overline{c} + n\tau) + n(a_h - a_f)]^2}{4b(n+2)^2}; \tag{17}$$

$$\overline{\pi} = \frac{[(a_f - \tau)[4(n+1) - \beta n] - a_h[(2-\beta)(n+1)] - \overline{c}[\beta + 2(n+1)]]^2}{4b(n+1)^2(n+2)^2}. \tag{18}$$

It is possible that the trade costs prohibit trade. Lemma 1 concerns this.

Lemma 1. *Trade costs are non-prohibitive if and only if:*

$$\tau < \hat{\tau} \equiv a_f - \frac{a_h[(2-\beta)(n+1)] + \overline{c}[\beta + 2(n+1)]}{4(n+1) - n\beta}. \tag{19}$$

Proof. Solving (16) for τ yields the expression in (19). □

3 The effects of trade on profits

We now investigate how the profits of the domestic downstream firm in sub-game perfect Nash equilibrium vary with the number of foreign rivals in the home market. Our motivation is to examine whether there are conditions under which the domestic downstream firm might have an incentive to lobby for a less protectionist trade policy through, for example, the granting of import licenses – or additional licenses – to rival foreign firms. We establish Proposition 1.

Proposition 1. *Profits of the domestic downstream firm increase in the number of entrants if and only if trade costs are sufficiently high.*

Proof. Differentiating (17) with respect to n, we obtain:

$$\frac{d\pi_h}{dn} = \frac{(2-\beta)^2(a_h - 2a_f + \overline{c} + 2\tau)(a_h + n(a_h - a_f) - \overline{c} + n\tau)}{2b(n+2)^3}, \tag{20}$$

which is non-negative – implying that profits are non-decreasing in the number of entrants – if and only if the following condition is satisfied:

$$\tau \geq \tilde{\tau} \equiv \frac{(2a_f - a_h - \overline{c})}{2}, \tag{21}$$

where $\tilde{\tau}$ is the threshold level of trade costs above which profits increase in the number of firms. □

It is clear that there are always ranges of non-prohibitive trade costs for which profits-per-firm are increasing in the number of firms since:

$$\hat{\tau} \geq \tilde{\tau} \Rightarrow (a_h - \overline{c})\beta\,[2+n] \geq 0. \tag{22}$$

We can see from equation (21) that the greater the home-bias (the lower a_f relative to a_h), the lower the cut-off level of trade costs for which there is profit-raising entry. It is interesting to note that in the absence of any home bias, that is $a_h = a_f = a$, the cut-off level of trade costs, $\tilde{\tau}$, becomes:

$$\tilde{\tau}|_{a_h=a_f=a} = \frac{a-\overline{c}}{2}.$$

This measure has an interesting economic interpretation in that it is the "competitive monopoly" output. That is, the output which would result if the downstream firm had a domestic monopoly and paying the competitive input price. In the absence of a home bias, thus, it is unlikely that profit-raising entry would be a frequent occurrence since the range of trade costs for which profit-raising entry does occur is close to the prohibitive level of trade costs.

We can illustrate the situation of profit-raising entry by comparing the profits obtained by the home firm when it is a monopolist in its own market with that obtained in a duopoly with a foreign competitor. Evaluating the downstream home firm's profits in (17) at $n = 0$ and $n = 1$, respectively, we obtain:

$$\pi_{h|n=0} = \frac{(2-\beta)^2(a_h-\overline{c})^2}{16b}; \tag{23}$$

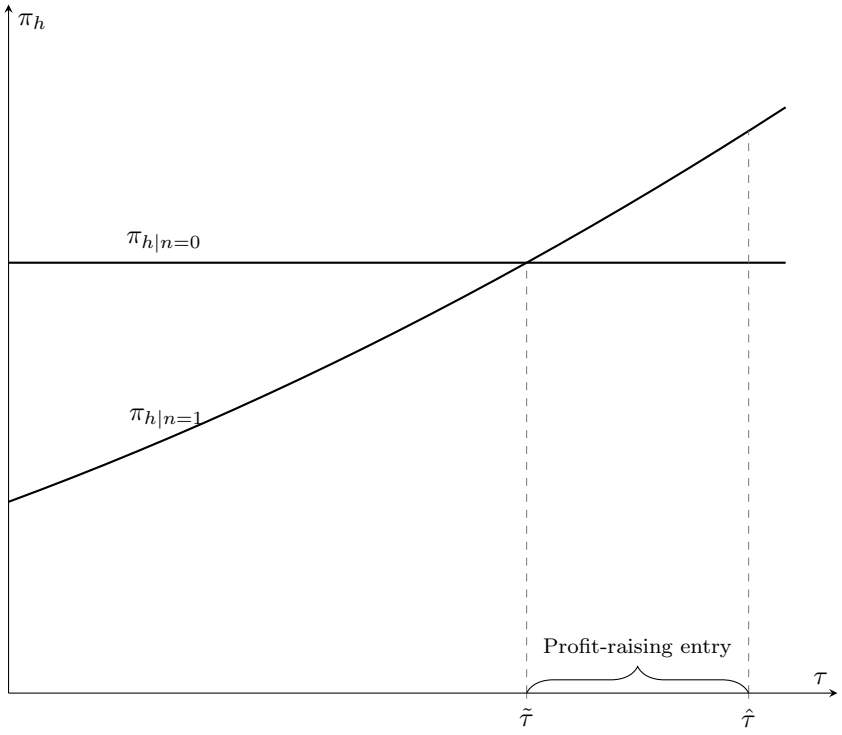
$$\pi_{h|n=1} = \frac{(2-\beta)^2[(a_h-\overline{c}+\tau)+(a_h-a_f)]^2}{36b}. \tag{24}$$

In Figure 1, we plot these functions for specific parameter values. It is clear from the figure that whenever $\tau \in [\tilde{\tau};\hat{\tau})$, the downstream home firm earns higher profits when it is in competition with a rival foreign entrant than when it has a domestic monopoly. From (20), it follows that the home firm's profits continue to rise in the number of foreign rivals, so long as (21) is satisfied. It is clear from (21) that the stronger the home bias (i.e. the greater a_h is relative to a_f), the greater the range of non-prohibitive trade costs for which there is profit-raising entry. It is even possible that for specific parameter values, the duopoly profits exceed monopoly profits for all positive non-prohibitive trade costs. For example, consider $a_h = 5$, $a_f = 3$, $\overline{c} = 1$, $b = 1$, and $\beta = \frac{1}{2}$. Plugging these parameter values into, respectively, (23) and (24), and taking the difference, yields:

$$\pi_{h|n=1} - \pi_{h|n=0} = \frac{\tau(12+\tau)}{16} \geq 0, \tag{25}$$

which is non-negative for all non-negative values of τ. This shows that in the presence of a strong bias towards domestically produced goods, the home firm prefers to accommodate entry regardless of the trade costs.

Figure 1: Profits of the incumbent firm for $n = 0$ and $n = 1$.



What is the intuition for the result that profits of the incumbent increase in the number of entrants if τ or the home bias are sufficiently high? In the standard model of oligopoly, an increase in the number of entrants unambiguously reduces the profits of incumbents through increased product market competition, which reduces the product price. This mechanism also works in the present model of oligopoly, however. We can see this by obtaining a specific expression for the product price. Substituting (7) and (8) into (1), we obtain:

$$p = \frac{a_h(n+1) + c_h - na_f + n(\overline{c} + \tau)}{n+2}, \tag{26}$$

where c_h is given by (14). Differentiating (26), it follows that:

$$\frac{dp}{dn} = \underbrace{\frac{1}{n+2}\frac{dc_h}{dn}}_{\text{Indirect effect}} \underbrace{- \left[\frac{2a_f - a_h + c_h - 2(\overline{c} + \tau)}{(n+2)^2}\right]}_{\text{Direct effect}}. \tag{27}$$

Notice that we are decomposing the effect of entry on the product price into an indirect effect through the input price, $\left(\frac{dp}{dc_h}\frac{dc_h}{dn}\right)$, and a direct effect of entry on the final product price, $\left(\frac{dp}{dn}\right)$. Assuming that $\frac{dc_h}{dn} \leq 0$, as we demonstrate below, it follows from (27) that $\frac{dp}{dn}$ must be negative: an increase in n leads to a fall in the product price.

In addition to the profit-reducing effect of the fall in the product price, however, the increase in the number of firms in the market also leads the upstream input supplier to moderate the input price. We can see this result by simply differentiating (14) with respect to n, which yields:

$$\frac{dc_h}{dn} = -\frac{(a_f - \overline{c} - \tau)\beta}{2(n+1)^2} \leq 0. \tag{28}$$

Put differently, the upstream input supplier is bearing a share of the cost associated with entry for all values of τ when $\beta > 0$. The domestic downstream firm benefits from the entry of a foreign rival if the profit-enhancing effect of entry on the moderation of input prices dominates the profit-reducing effect of entry on the product price. Using the definition of c_h in (14) and $\hat{\tau}$ in (19), we can rewrite (27) as:

$$\frac{dp}{dn} = \underbrace{-\frac{(a_f - \overline{c} - \tau)\beta}{2(n+2)(n+1)^2}}_{\text{Indirect effect}} \underbrace{-\frac{(\hat{\tau} - \tau)(4(n+1) - n\beta)}{2(n+1)(n+2)^2}}_{\text{Direct effect}}. \tag{29}$$

It is clear that the direct effect of entry on the product price becomes smaller as τ approaches the prohibitive level of trade costs $\hat{\tau}$. If we further differentiate (29) with respect to τ, we obtain:

$$\frac{d^2p}{dnd\tau} = \frac{4(n+1)^2 + \beta(2-n^2)}{2(n+1)^2(n+2)^2} > 0. \tag{30}$$

This implies that as τ increases the profit-reducing effect of entry through increased product market competition becomes smaller, thus making entry more profitable. The intuition for this last effect is that an increase in the trade cost will increase the domestic downstream firm's market share in the home market, and hence the impact of foreign competition on the product price will be smaller. The implication is that higher trade costs makes it more likely that the home firm will accommodate rather than deter entry.

3.1 Unions as upstream input suppliers

Labour unions have been characterised as a potential instrument with which incumbent firms can deter further market entry (Williamson, 1968). In the standard Cournot oligopoly model, with profits-per-firm unambiguously decreasing in the number of firms in the market, there is an unambiguous incentive for firms to attempt to restrict entry. This was the explicit focus of the analysis of Seade (1980) in establishing the nature of the relationship between the number of firms and profits-per-firm in the standard model of oligopoly. Suppose that the upstream agent analysed in this paper is not a profit-maximising firm but a utility-maximising labour union. In this case, the input price of the downstream firm in home, c_h, represents the outcome of the union-firm bargaining over the wage rate. Our model can thus illustrate a situation in which, contrary to the implications of Williamson (1968), unions can be associated with pro-trade behaviour if trade costs or the bias towards domestic goods are sufficiently high. In an earlier paper, Naylor and Soegaard (2014), we showed a similar channel through which unions might make entry more profitable. The analysis in that paper, however, relied on unions placing a sufficiently high weight on the wage relative to employment.

4 Stackelberg leadership

Thus far, we have studied the effects of entry when the incumbent firm competes á la Cournot in its own market. In reality it is likely that domestic firms may have acquired structural and distributional advantages over foreign firms due to incumbency or for geo-political reasons. In this section we augment the basic model by assuming that the home firm has a first-mover advantage in the Stackelberg sense. The game now has the following stages: in the first, the upstream and downstream home firms bargain over the input price; in the second, the incumbent domestic downstream firm solves for its output choice; in the final stage, each foreign entrant solves for their output levels. We proceed by backward induction. Foreign entrant i maximises profits in (4), and we thus obtain the best-reply function in (6), which we solved out in the previous section. In the second stage, the incumbent firm maximises profits, but with the knowledge of how the entrants will respond. Multiplying the output of entrant i in (6) by the total number of entrants n and substituting the resulting expression into (3) we obtain the maximand of firm h as:

$$\pi_h = \frac{[(a_h - c_h)(n+1) - bq_h - na_f + n(\overline{c} + \tau)]\, q_h}{(n+1)}. \tag{31}$$

Maximising the profits of firm h and solving for q_h yields:

$$q_h = \frac{(a_h - c_h)(n+1) - n(a_f - \overline{c} - \tau)}{2b}. \tag{32}$$

Substituting this expression back into the output of entrant i in (6), and using symmetry across each entrant, we obtain an expression for the output of each entrant:

$$q_i = \overline{q} = \frac{(2+n)(a_f - \overline{c} - \tau) - (a_h - c_h)(n+1)}{2b(n+1)}. \tag{33}$$

We can obtain an expression for the profits of the incumbent firm by substituting (32) into (31):

$$\pi_h = \frac{[(a_h - c_h)(n+1) - n(a_f - \overline{c} - \tau)]^2}{4b(n+1)}. \tag{34}$$

In the first stage of the game we solve for the input price. The profits of the upstream input supplier can be obtained by substituting (32) into (11). The maximand of the home firms is still as in (12). Substituting the profits of the input supplier and those of the domestic downstream firm into (12) yields:

$$B_h = \left[\frac{(c_h - \overline{c})((a_h - c_h)(n+1) - n(a_f - \overline{c} - \tau))}{2b}\right]^{\beta} \left[\frac{[(a_h - c_h)(n+1) - n(a_f - \overline{c} - \tau)]^2}{4b(n+1)}\right]^{1-\beta}. \tag{35}$$

Maximising (35) with respect to c_h, we obtain:

$$c_h = \frac{[a_h - \overline{c} + n\tau + n(a_h - a_f)]\beta + 2\overline{c}(n+1)}{2(n+1)}. \tag{36}$$

Substituting this expression for the input price back into (32) and (33), respectively, yields:

$$q_h = \frac{(2-\beta)[a_h - \overline{c} + n\tau + n(a_h - a_f)]}{4b}; \tag{37}$$

$$\overline{q} = \frac{4a_f - (2-\beta)a_h - (2-\beta)(a_h - a_f) - (2+\beta)\overline{c} - (n(2-\beta)+4)\tau}{4b(n+1)}. \tag{38}$$

We can obtain an expression for the profits of the downstream home firm by substituting the input price in (36) into (34):

$$\pi_h = \frac{(2-\beta)^2(a_h(n+1) - na_f - \overline{c} + n\tau)^2}{16b(n+1)}. \tag{39}$$

As in the Cournot case, it is possible that trade costs prohibit trade. We establish Lemma 2:

Lemma 2. *Trade costs are non-prohibitive if and only if:*

$$\tau < \hat{\tau}^S \equiv \frac{4a_f - (2-\beta)a_h - (2-\beta)(a_h - a_f) - (2+\beta)\overline{c}}{4 + n(2-\beta)}. \tag{40}$$

We now investigate how profits change with entry in the Stackelberg case. We establish Proposition 2:

Proposition 2. *Profits of the domestic downstream firm increase in the number of entrants if and only if trade costs are sufficiently high.*

Proof. Differentiating (39) with respect to n yields:

$$\frac{\pi_h}{dn} = -\frac{(2-\beta)^2[(2+n)a_f - (n+1)a_h - \overline{c} - (n+2)\tau][a_h(n+1) - na_f - \overline{c} + n\tau]}{16b(n+1)^2}, \tag{41}$$

which is non-negative if and only if the following condition is satisfied:

$$\tau \geq \tilde{\tau}^S \equiv \frac{(2+n)a_f - (n+1)a_h - \overline{c}}{2+n}, \tag{42}$$

where $\tilde{\tau}^S$ is the threshold level of trade costs above which profits increase in the number of firms in the Stackelberg case. □

Hence, as in the case of Cournot competition, the domestic downstream firm enjoys a potential benefit from foreign competition. The mechanism is as before: the profit-enhancing effect of a lower bargained input price offsets the profit-reducing effect of a lower final product price. From comparison of $\tilde{\tau}^S$ and the equivalent threshold derived under Cournot competition in the previous section, it is clear that if the downstream home firm has a first-mover advantage, it enjoys beneficial effects of entry for lower levels of trade costs, that is $\tilde{\tau}^S \leq \tilde{\tau}$.

5 Conclusions

In this paper, we consider the likely attitudes of a domestic downstream firm in bilateral monopoly to the threat of foreign competition. We assume that foreign firms incur low and exogenous production costs but face additional – and exogenous – import costs, in the form of transportation costs, for example. There are no explicit tariffs.[6] Instead, the instrument of trade policy is based on the granting of import licenses. We show that the domestic downstream firm has a potential incentive to lobby for the granting of import licenses to foreign rivals as its profits can be increasing in the number of foreign competitors. The intuition for this is that although increased product market competition drives down the final product price and hence reduces the profits of the downstream home firm, there is a countervailing profit-enhancing effect arising from the fact that entry generates moderation of the input price bargained between the domestic upstream and downstream firms.

We found that there is a threshold level of trade costs above which the domestic downstream firm would see its profits increased following entry. This result is stronger if in addition to the trade costs there is a bias on the part of the domestic consumer towards domestically produced goods: the stronger such bias, the lower the threshold of trade costs required for the incumbent domestic firm to realise enhanced profits following entry. We also identified specific parameter values for which there is profit-raising entry for all non-negative trade costs, a case where the home bias was particularly high. Moreover, we extended the model to allow for a first-mover advantage of the domestic firm in the Stackelberg sense. Our finding in this case is that Stackelberg competition generates an enhanced willingness on the part of the domestic downstream firm to accommodate entry from abroad. Our results counter the standard notion in the literature on Protection for Sale (Grossman and Helpman, 1994) in which domestic import-competing firms have an unambiguous incentive to deter rather than accommodate entry.

[6] Although such barriers could be subsumed in the parameter which represents transportation costs

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