



THE UNIVERSITY OF
MELBOURNE

Melbourne Institute Working Paper Series

Working Paper No. 25/06

Parallel Imports, Market Size and Investment Incentive

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MELBOURNE INSTITUTE
of Applied Economic and Social Research

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The University of Melbourne

Melbourne Institute Working Paper No. 25/06

ISSN 1328-4991 (Print)

ISSN 1447-5863 (Online)

ISBN 0 7340 3226 9

November 2006

* Jongsay Yong is the corresponding author. Thanks are due to John Creedy and participants at the Melbourne Institute internal seminar for comments and suggestion, and to IPRIA for research funding. The views expressed in the paper and any remaining errors therein are of the authors.

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Abstract

We use a vertical control model with a two-part tariff pricing and a leader-follower competition to investigate some conditions which may prevent the occurrence of parallel importing even when such activity is legally permitted and the effects of parallel importing on the incentive to invest in market development effort for an authorised distributor faced with competition from parallel imported products. We find that parallel imports cannot arise if the target and the source market either differ too greatly or are too similar in size. Also, both the presence of parallel imported products and the threat of such presence reduce the domestic distributor's market development investment.

Keywords: parallel imports, vertical control, intellectual property

JEL Codes: L11, F13, 034

1. Introduction

This paper looks at the issue of parallel importing with one objective of understanding market conditions which may prevent its occurrence even when it is legally permissible. It is clear that parallel importing could not arise but for the price differentials that exist across countries. However, price differentials are not sufficient conditions. The IP owner, for example, may strategically choose to shutdown the foreign market from which parallel imported products are sourced if that move optimises its profits. This paper investigates how market size affects the IP owner decision on whether or not to allow parallel imports. The second objective of the paper is to study the effects of parallel importing on the investment incentive of the authorised distribution channel for marketing the products. If parallel importers can ‘free-ride’ on such investments, then the presence of parallel imports may undermine the incentive for the authorised distributor to invest in market development. We look at how such effects vary depending on the legality of parallel imports in the importing markets.

Parallel importing is the commercial importation and distribution of legitimate goods by traders who are not the authorised distributors. This trade practice has become increasingly common because of factors such as increased globalisation of production, reduced freight costs, and increased flows of information and transactions via, say, the internet.¹ One main reason why parallel importing arises in the first place is that virtually the same goods are being sold in different countries at vastly different prices so that a trader can purchase the goods in the low-price country and import them into the high-price country to make a profit.

One central issue with regards to parallel importing is whether or not it should be banned by the law. Currently, there is a debate on whether or not intellectual property (IP)

¹ The variety of products that are often parallel imported extends from household items, such as shampoos and perfumes, to pharmaceutical drugs and big-ticket items, such as electronic appliances and motor vehicles.

laws should also block the importation of goods that are lawfully obtained in another country in the same way it blocks the importation of counterfeited goods. The problem is the products being parallel imported are genuine articles, unlike counterfeits or ‘black market’ goods. In relation to our first objective above, the legal debate would benefit from a better understanding of what market conditions would, in equilibrium, lead to the occurrence of parallel importing.

As stated earlier, parallel importing could not arise but for the price differentials that exist across countries. These price differentials may exist because of, for examples, currency fluctuations, international price discrimination by manufacturers, and different marketing strategies pursued by IP owners or authorised distributors in different countries (Picard, 1995–96).² The first two reasons basically mean that parallel importing is nothing more than a form of international price arbitrage. The economic effects of such activities are quite uncontroversial as far as the static efficiency of the domestic economy is concerned.³ A more controversial cause of price differentials and thus parallel importing is the third one. More specifically, an authorised distributor may make substantial investments to improve business by undertaking promotion and market development efforts. However, the parallel importers may take advantage of such investments by selling the same product obtained from a foreign source at a lower price. This ‘free riding’ implies that the presence of parallel imports may undermine the incentive for the authorised distributor to invest in market development.⁴

Despite the potentially significant economic implication of parallel importing, few economic analyses of it exist in the literature. Malueg and Schwartz (1994) is considered as a classic economic study of parallel imports. In their study, they use a monopoly discriminatory

² See also Hilke (1988) and Barfield and Groombridge (1998).

³ However, for a different view, see Malueg and Schwartz (1994) who consider the impact of parallel imports on global welfare rather than national welfare.

⁴ See Chard and Mellor (1989).

pricing model to show that parallel importing benefits consumers in the high-price countries but could harm consumers in the low-price countries who may not be served by the monopolist in a uniform pricing environment. Thus, in a policy regime that permits parallel importing, global welfare could suffer if demand dispersion between countries is high. In another interesting study, Richardson (2002) considers a two-stage policy-setting game in which countries first simultaneously choose whether to permit or prohibit parallel imports; and then the IP owner, a monopolist, sets a price in each country. In this setting, Richardson showed that any Nash equilibrium of the game must involve every country allowing parallel imports. In other words, we should effectively observe global uniform pricing. Most of other studies are more policy oriented, such as Danzon and Towse (2003), OECD (2003) and Abbot (1998). There are some exceptions which are closest to our study such as Maskus and Chen (2004), Li and Maskus (2004), Valletti and Szymanski (2005).

Maskus and Chen (2004), for example, model parallel importation as a vertical price control problem between an IP owner and a distributor who sells in two markets. They show that parallel imports may arise endogenously as a result of an efficient two-part pricing scheme. If the IP owner sets a wholesale price that is sufficiently low, the distributor has an incentive to sell the product in another country without the authorization of the IP owner. If the latter is unable to impose effective territorial restrictions, it can still reduce or eliminate parallel imports by raising the foreign wholesale price. However, this high wholesale price leads to lower profits in the foreign market. In equilibrium the IP owner balances the trade-off between achieving efficient vertical pricing and preventing parallel importing. The key to their result is the assumption that parallel importers are able to source the products at the foreign wholesale price. Our study relaxes this assumption.

As in Maskus and Chen (2004), we model parallel importing in a setting in which the activity is a by-product of a vertical control problem. In our model, an IP owner appoints an authorised distributor for a domestic market and a foreign market. We assume, for simplicity, that parallel imports flow in one direction only from the foreign market to the domestic market. Unlike Maskus and Chen (2004), however, we model the parallel importers as fringe firms who compete with a dominant firm (the authorised domestic distributor) in a price-leadership model. More importantly, we allow for the domestic distributor to invest in market development efforts which would result in shifting its demand curve upward.

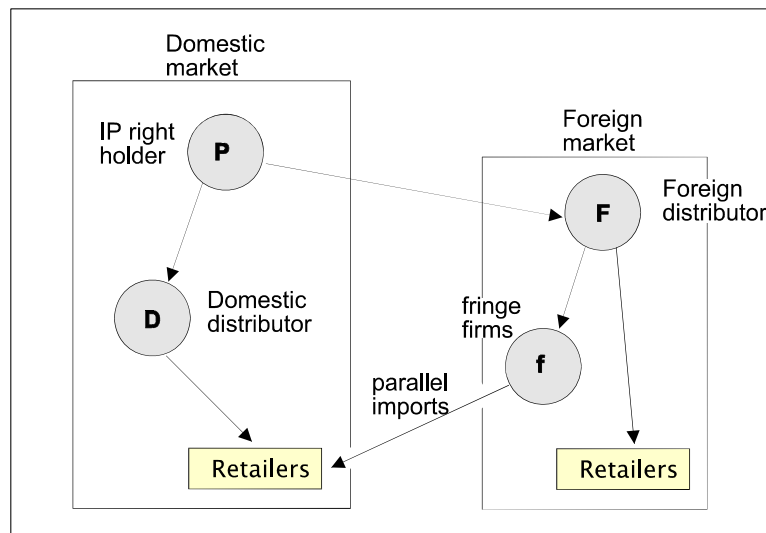
Two recent papers that also discuss the investment effect of parallel imports are Valletti and Szymanski (2005) and Li and Maskus (2004). Valletti and Szymanski extend Malueg and Schwartz (1994) to examine the effects of parallel importing on product quality. They show that parallel imports dilute the IP owner's incentive to invest in quality. As quality also affects consumers' surplus, they argue that there exists a trade-off between the consumer benefits of parallel imports and the reduction in incentives to invest in quality. Li and Maskus, on the other hand, consider a model where an IP owner engages in cost-reducing R&D and sells his product into another country through a distributor. They too find that parallel imports discourage R&D investment.

The rest of the paper is organized as follows. Section 2 sets up the model. Section 3 discusses the equilibrium under a social planner. The finding is then used as a benchmark for discussing the market equilibriums under two legal regimes. Section 4 examines the case when parallel imports are banned by the law. Section 5 discusses what happens when parallel imports are permitted legally. Finally, Section 6 provides some concluding remarks.

2. Basic setup

There are several key parties in a parallel importing situation: the IP owner, the authorised distributor in the importing country, the distributor of the goods in the exporting country, and the parallel importers.⁵ We consider a stylised situation depicted in Figure 1 below.

Figure 1: A case of parallel importing



In Figure 1, four economic agents are classified as an IP right owner (P) who appoints a domestic (D) and a foreign (F) authorised distributors, and a group of parallel importers (f). P sells the product in the domestic and foreign markets via each respective authorised distributor. In the domestic market, in addition to selling the products, D also invests in market development, product promotion, advertising, and general business goodwill.⁶ In the foreign market, f , the parallel importers, purchase the products directly from F and imports/sells the products in the domestic market.⁷ D as the authorised

⁵ It is not uncommon for the authorised distributors to be assigned the IP rights. In this case, the distributors are also the IP owner of the goods in their respective countries.

⁶ The foreign authorised distributor may do likewise in the foreign market, but this issue is of no interest in this paper.

⁷ f may also be allowed to purchase from a third party without changing the substance of the model.

domestic distributor may react to the parallel imports by an economic action (price competition) or a legal action (suing f for infringements of his domestic rights).

Which action D chooses depends on whether or not parallel importing is legal in the domestic market, which in turn depends on the IP rights principles of exhaustion.⁸ There are two principles of exhaustion. First, the international or universal exhaustion doctrine, also known as the principle of universal rights, states that the buyer inherits all the rights to the goods. The seller has exhausted her rights once she willingly parts with the goods. The buyer is thus free to do as he pleases with regards to the goods, including selling them to another country in the form of parallel imports.⁹ Parallel imports are therefore legal under a strict reading of this doctrine. In other words, if the domestic market adopts the ‘universality principle’, then parallel importing is legal since f , who purchases the goods legally in another country without any expressed restrictions on exportation, has the rights to import product into the domestic market.

The second principle of exhaustion is the national or territorial exhaustion doctrine.¹⁰ In this case, each country grants IP protection within its own territorial limit. Thus, the rights so conferred are confined within the national boundary. This implies that the rights of an IP owner under one country’s law are independent from and separate to her rights under another country’s law. The fact that a parallel trader bought the goods from one country does not confer him the rights to export and distribute the goods in another country. This is because the seller did not fully exhaust her rights when he made the sale. Thus parallel imports are illegal under this doctrine. That is, if the domestic market is under the ‘territoriality principle’, the rights f inherits from F in a transaction that takes place in a foreign country would not include the rights to import and sell in the domestic market. Accordingly, f

⁸ The principles regarding the point at which the IP rights of the seller of a good become exhausted.

⁹ In the United States, this principle is also known as the ‘first-sale’ doctrine.

¹⁰ This is also known as the principle of territoriality, focuses on the division of the world into nation states.

infringes on D 's domestic rights so long as the latter has not authorized the goods to be sold in the domestic market.

We construct a simple vertical control model based on the stylised setting above. The IP right holder (P) holds the rights to a product sold in the domestic and foreign markets. To avoid unnecessary complications we assume that the flow of parallel imports is unidirectional from the foreign to the domestic market. For this one-way flow to occur, we need the foreign retail price to be lower than the domestic price. So, we assume the foreign market as having a lower demand than the domestic market (perhaps because of lower income). In Figure 1, P appoints an authorised distributor for each market via a supply contract that takes the form of a 'two-part pricing scheme,' i.e., a per unit price W_i and a fixed fee H_i , where $i = D, F$. The fixed fee serves as a profit-sharing device between P and its downstream distributors.¹¹

In the competitive setting of the model, P, D, F , and f would then play a three-stage game. In stage 1, P appoints an authorised distributor for each market. The supply contract between the IP owner and the distributor takes the form of a two-part tariff. In stage 2, given the supply contract, D decides how much to invest in market development. In stage 3, D and f engage in a leader-follower price competition if parallel imports are legally permitted. Otherwise D acts as a monopoly in the domestic market.

To complete the set-up of the model, let c^P be the constant marginal cost for P to produce the product. It can be shown that when parallel imports are banned the profit maximising wholesale price is $W_i = c^P$ and the fixed fee is set according to a negotiation process which depends on, among other considerations, the negotiating parties' bargaining

¹¹ This two part pricing arrangement avoids the well-known problem of double marginalization in pricing by successive monopolies.

power. This pricing scheme also gives the downstream firms the ‘correct’ incentive in the sense that they will act to maximise the ‘joint profit’ of the upstream and downstream firms.

Allowing for parallel imports, we model the parallel importers as a group of n fringe firms which buy the product from the foreign market, and import into and sell the product in the domestic market, thus directly competing with D . In other words, in the domestic downstream market there are now n competitive fringe firms and a single dominant firm D .

For simplicity, let the domestic downstream demand curve be given as $p = a - Q$.

We assume that the intercept term of the demand curve (a) can be shifted the action of D only. For concreteness, we refer to this action as D 's market development effort. Specifically, D can choose an effort level e which determines the intercept of the demand curve according to a functional relation $a = a(e)$, where $a'(e) > 0$, $a''(e) < 0$, $a(0) > c > c_0$, and (c, c_0) are the marginal costs of D and each of the fringe firms (f), respectively. These assumptions imply that market size increases with e but at a decreasing rate, demand is high enough to support D in the market even if D chooses $e = 0$, and parallel imports would occur when allowed. We further assume that the unit cost of market development effort is given by $d(e)$, where $d'(e) > 0$ and $d''(e) \geq 0$. In the foreign market, we specify a similar linear demand curve of the form of $\hat{p} = \hat{a} - \hat{Q}$, where we assume $\hat{a} < a(0)$. That is, the foreign market is assumed to have a lower demand than the domestic market even if D expends no market development effort.¹² Finally, we assume that the fringe firms are capacity constrained such that for each f , $q_f \leq \bar{q}$, giving a total maximum capacity of all fringe firms in the domestic market as $n\bar{q}$.

¹² We abstract from the possibility of market development for the foreign market as this issue is of no relevance.

3. Equilibrium under a social planner

The solution to the social planner's problem serves as a benchmark to assess the equilibrium outcomes of the competitive vertical control model. It can be shown that the social planner sells the goods at marginal cost c^P in each market to maximise social surplus.¹³ We look at what happens in the domestic market only as the situation for the foreign market is analogous and is omitted for the sake of brevity.

First, notice that the same marginal cost pricing applies in both domestic and foreign markets so that the question of parallel importing under the social planner's problem does not arise. Now, with $p = c^P$ and an effort level of e , the domestic market demand is

$Q(c^P) = a(e) - c^P$ and the consumers' surplus can be expressed as

$$CS(a(e)) = \int_0^{a(e)-c^P} p(x)dx - c^P Q(c^P) = \frac{1}{2}(a(e) - c^P)^2 \quad (1)$$

The social planner chooses e to maximise net consumers' surplus $CS(a(e)) - d(e)$.¹⁴ Thus, the socially optimal e , denoted by e^P must satisfy the first-order condition

$$a(e) - c^P = g(e^P) \quad (2)$$

where $g(e) \equiv \frac{d'(e)}{a'(e)}$ increasing in e given our assumptions on $d(\bullet)$ and $a(\bullet)$.

4. Competitive equilibrium when parallel imports are banned

When parallel imports are banned by law, the fringe firms can no longer operate in the domestic market. So, the distributors D and F each operates as a monopoly in each respective market. We look at the maximisation problem of D , bearing in mind that the maximisation problem of F can be solved analogously.

D 's problem is a standard monopoly profit maximisation problem given by

¹³ As a result, the producers' surplus will not play any role in the social welfare problem shown below.

¹⁴ Thus, implicitly, we assume away any income effect in the social planner's problem. This assumption is reasonable if the value of parallel imported goods in the consumption bundle is small, as mostly the case for consumers in developed countries. We thank John Creedy for pointing this out.

$$\pi^m = \max_q (p - c)q \quad (3)$$

where $p = a(e) - q$. Given an effort level of e and a constant marginal cost of c , the optimal levels of monopoly output and quantity are $q^m(e) = \frac{1}{2}(a(e) - c)$ and $p^m(e) = \frac{1}{2}(a(e) + c)$, respectively.

Substituting q^m and p^m into the above profit function and solving for the optimal level of e , we obtain D 's optimum market development effort (e^m) which satisfies the following first order condition

$$a(e^m) - c = 2g(e^m) \quad (4)$$

where, as before, $g(e) \equiv \frac{d'(e)}{a'(e)}$. Comparing (4) and (2) and noting that $g(\bullet)$ is an increasing function, we have $e^m < e^p$.

5. Competitive equilibrium when parallel imports are legally permitted

In this case, P 's vertical control problem is more complex. In setting the foreign wholesale price with F , P must take into account that even if a high wholesale price which leads to a high retail price in the foreign market could prevent parallel imports, it would also lead to a lower profit for the foreign market distributor. In fact, it can even lead to a total shut down of the foreign market.

As explained before, all the relevant economic agents would play a multi-stage game consisting of the following sequence of events:

- (1) P and i negotiate a supply contract (W_i, H_i) , $i = D, F$.
- (2) Given the supply contract, D chooses a level of market development effort e .
- (3) Given the supply contract and D 's market development effort, the fringe firms and D engage in the domestic retail market competition:
 - (i) D sets retail price p .

(ii) Given p , the n fringe firms decide whether to parallel import the product into the domestic market.

A complicating feature of this game is that in stage 1, P and F may reach a foreign wholesale price level W_F which can either accommodate or deter parallel imports. If they accommodate parallel imports, they would set W_F to maximise their joint profit in the foreign market without any restriction for stopping the flow of parallel imports. On the other hand, they can set W_F sufficiently high to deem parallel importing as unprofitable.

As usual, we proceed to find the equilibrium of the game by looking at the last stage, the domestic retail market competition, taking as given the outcomes of the earlier stages $\{W_F, W_D, e\}$. Given D 's choice of price p , each of the identical n fringe firms has a best response function of

$$q_f^r = \begin{cases} \bar{q} & \text{if } p \geq c_0 \\ 0 & \text{otherwise.} \end{cases} \quad (5)$$

Then, the residual demand of D is

$$q_D = \begin{cases} a(e) - p - n\bar{q} & \text{if } p \geq c_0 \\ a(e) - p & \text{otherwise.} \end{cases} \quad (6)$$

For the time being, suppose $a(e)$ is sufficiently large for D and all fringe firms to operate at $p \geq c_0$. That is, suppose $a(e) > c + n\bar{q}$. Then, rearranging equation (6), we have $p = a(e) - (q_D + n\bar{q})$. So, D would choose q_D to maximise profits by solving the following optimisation problem

$$\pi_D = \max_{q_D} (p - c)q_D \quad (7)$$

From the first order condition we obtain

$$q_D(e) = \frac{1}{2}(a(e) - c - n\bar{q}) \quad (8)$$

and

$$p(e) = \frac{1}{2}(a(e) + c - n\bar{q}) \quad (9)$$

Thus, by our assumption above, the equilibrium quantity supplied by each fringe firm is

$$q_f^0 = \bar{q}.$$

Also, by supposition, $p(e) > c$ and $q_D(e) > 0$ for all $e \geq 0$. Therefore, the price $p(e)$ and quantities $(q_D(e), q_f^0)$ can be supported as an equilibrium outcome of this dominant-fringe firm competition.¹⁵ The associated equilibrium profit for D is

$$\pi_D(e) = \frac{1}{4}(a(e) - c - n\bar{q})^2. \quad (10)$$

5.1. *Optimal market development effort under parallel import*

Now, we consider D 's market development effort. If parallel imports occur, then D chooses e to maximise the last-stage reduced-form profit given in equation (10). From the first-order condition, the optimal effort level (e^0) is implicitly given as

$$a(e^0) - c = 2g(e^0) + n\bar{q}. \quad (11)$$

where g is as previously defined. Thus, comparing (11) with (4), we see that for any given e , D 's market development effort is lower when parallel importing occurs. This result is hardly surprising given that the parallel importers might be able to free-ride on D 's marketing investment. We will return to this comparison of investment effort below. In addition, at the optimal effort level (e^0), it can be shown that the equilibrium profit of D is given by

$$\pi_d^0 = \frac{1}{4}(a(e^0) - c - n\bar{q})^2 - d(e^0). \quad (12)$$

¹⁵ Notice that if instead of our assumption $a(e) \leq c + n\bar{q}$ then the fringe firms will be priced out of the market and the market reduces into the monopoly case.

5.2. Conditions for parallel importing to occur

To examine under what conditions would parallel importing occur, we look at the negotiation of supply contract between P and D , and P and F , respectively. Because the determination of wholesale price in the domestic market does not affect the foreign market, following the logic of the previous section, P and D maximise a joint profit by setting $W_D^* = c^P$ and use the fixed fee to divide the resulting joint profit. The setting of supply contract between P and F is more complicated, as the setting of W_F affects the domestic market from the presence of parallel imports. In effect, P needs to compare two different scenarios. First, if P sets $W_F = c^P$ to maximise the joint profit with F , parallel imports will flow from the foreign market into the domestic market. In this case, the competition from fringe firms would affect the downstream profits (D 's profits) adversely. Second, if P sets W_F at a sufficiently high price, so that parallel imports become unprofitable for the fringe firms, D then becomes the only seller in the domestic market. However, a high W_F will affect the joint profit between P and F adversely. Therefore, P must try to balance such trade-off in optimising its own profits.

5.2.1 Parallel imports accommodated

In this case both wholesale prices are set at P 's marginal cost ($W_i = c^P, i = D, F$).

Furthermore, D 's optimal market development effort (e^*) is given by the following first order condition

$$a(e^*) = 2g(e^*) + n\bar{q}. \quad (13)$$

5.2.2 Parallel imports deterred

Suppose P and F set the foreign wholesale price W_F with the intent of deterring parallel imports. There are two ways that P and F can choose: first, set W_F sufficiently high to deter

parallel imports but not too high that would result in zero demand in foreign market; or, second, set W_F high enough to deter parallel import by completely shutting down the foreign distribution channel.

If e^x denotes the optimal level of D 's market development effort in this specific setting, then it can be shown that the first option above is taken if and only if

$$a(e^x) - \hat{a} \leq a^* \quad (14)$$

where $a^* \equiv 2(\hat{a} - c^P)$ and \hat{a} , as defined earlier, denotes the intercept in the foreign market demand function. If (14) is not satisfied, then the second option is chosen.

5.2.2.1 Foreign market maintained

In the foreign market, given a wholesale price W_F , F chooses \hat{p} to maximise profit according to

$$\pi_F = \max_p (\hat{p} - W_F)(\hat{a} - \hat{p}). \quad (15)$$

Solving this optimisation problem results in a profit-maximising retail price in the foreign market which depends on W_F in the following way

$$\hat{p}(W_F) = \frac{1}{2}(\hat{a} + W_F). \quad (16)$$

This foreign retail price will also be the marginal cost (c_0) of any parallel importer who purchases from F .

In the domestic market, following the earlier discussion, P sets the wholesale price to its marginal cost so that $W_D = c^P$. Since the domestic retailer wants to deter parallel imports, it sets the domestic retail price to the marginal cost of the parallel importer:

$$p^x = c_0 = \hat{p}(W_F). \quad (17)$$

Thus, we have an equality of retail prices in the domestic and foreign market when parallel import is deterred.¹⁶

Given the domestic retail price, D 's optimal market development effort (e^x) satisfies the following first order condition

$$(p^x(e^x) - c)a'(e^x) - (2p^x(e^x) - a(e^x) - c)\frac{dp^x}{de}\Big|_{e=e^x} = d'(e^x) \quad (18)$$

where $p^x(e^x)$ is the domestic retail price at the optimal market development effort level.

Anticipating (16)-(18), P and F choose W_F to solve the following profit optimisation problem

$$\max_{W_F} (p^x - c^P)(a(e^x) - p^x) + [(\hat{p}(W_F) - W_F)(\hat{a} - \hat{p}(W_F))] + [(W_F - c^P)(\hat{a} - \hat{p}(W_F))] \quad (19)$$

which is essentially the joint profit optimisation problem of P , D , and F . After substitutions, this simplifies to

$$\Pi_J^x = \max_{W_F} \frac{1}{2} [(\hat{a} + W_F - 2c^P)(a(e^x) - W_F)] \quad (20)$$

which gives an optimal foreign wholesale price of

$$W_F^x = \frac{1}{2}(a(e^x) - \hat{a} + 2c^P) \quad (21)$$

which implies, from (16), an optimal foreign retail price of

$$\hat{p}^x = \frac{1}{4}(a(e^x) + \hat{a} + 2c^P) \quad (22)$$

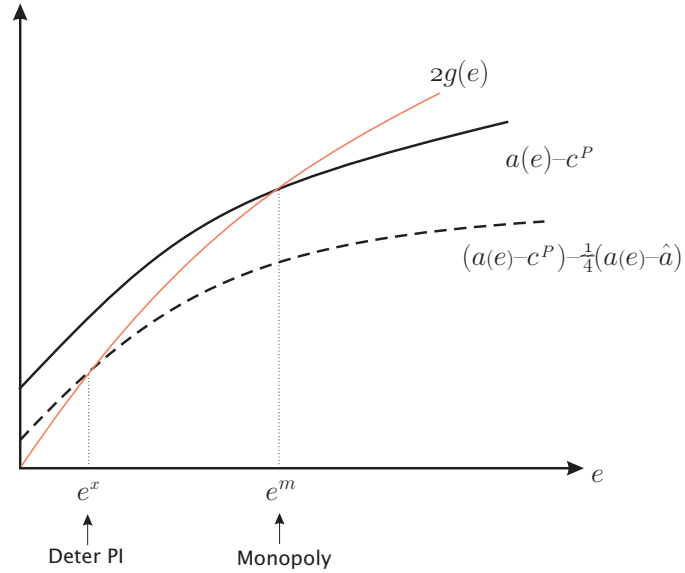
Using (16)-(18) and (21), we can derive the first order condition for D 's optimal market development effort (e^x) as

$$a(e^x) - c^P - \frac{1}{4}(a(e^x) - \hat{a}) = 2g(e^x) \quad (23)$$

¹⁶ This equality occurs because we assume that parallel importing incurs no transaction nor transportation costs. Relaxing this assumption would not change the qualitative nature of our results.

which is a flatter function with a lower intercept compared to (4) as shown in Figure (2) below. Thus, $e^x < e^m$. In other words, even if parallel imports are deterred, the threat of such competition is enough to reduce the investment incentive of the authorised distributor.

Figure 2: Marketing effort when parallel imports are deterred or banned



To derive the condition for which parallel imports are deterred in an optimal equilibrium, denote the optimum joint profit for P when the foreign market is maintained and parallel imports are deterred as Π_j^x and when parallel imports are accommodated as Π_j . Then P would deter parallel imports if and only if $\Pi_j^x \geq \Pi_j$. Using equations (12), (13), (20), and (21), it can be shown that this condition implies the following inequality that must be satisfied for P to deter parallel imports while still maintaining the foreign market operation

$$a(e^x) - \hat{a} \geq \sqrt{2n\bar{q}(2a(e^x) - 2c^P - n\bar{q})} \quad (24)$$

5.2.2.2 Foreign market shutdown

This case occurs when $a(e^x) - \hat{a} > a^*$, where as before $a^* \equiv 2(\hat{a} - c^P)$. To see why, recall that to deter parallel imports, D sets $p^x = c_0 = \hat{p}^x$. So, from equations (22) and the assumed linear downwards stream demand $\hat{Q}^x = \hat{a} - \hat{p}^x$, the quantity supplied in the foreign market is

$$\hat{Q}^x = \frac{1}{4}(3\hat{a} - a(e^x) - 2c^P) \quad (25)$$

Clearly, \hat{Q}^x goes down to zero when the inequality $a(e^x) - \hat{a} > a^*$ is not satisfied.

The deterrence of parallel imports and the complete shutdown of the foreign market give a joint profit for P and D in the domestic market that is identical to a monopoly profit

$$\Pi_j^x = \frac{1}{4}(a(e^m) - c^P)^2. \quad (26)$$

Similarly as before, P would prefer to deter parallel imports and shutdown the foreign market to allowing for parallel imports if and only if $\Pi_j^x \geq \Pi_j$. It can then be shown that this condition is equivalent to

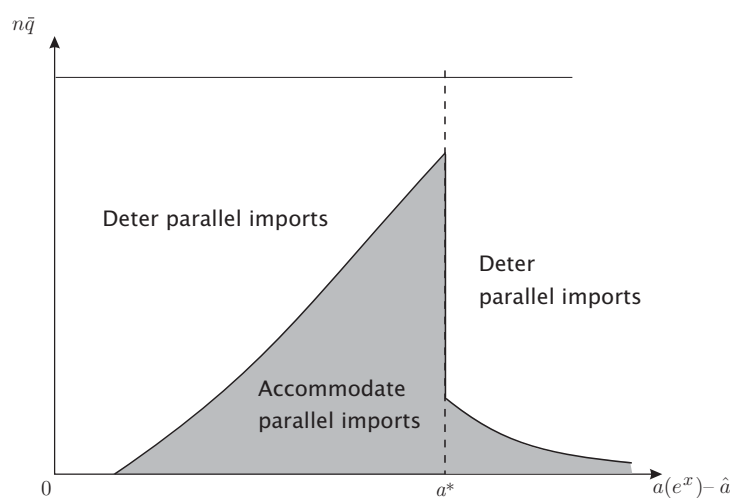
$$a(e^m) - \hat{a} \geq \frac{(a(e^m) - c^P - n\bar{q})^2}{(a(e^m) - c^P) + (\hat{a} - c^P)}. \quad (27)$$

The results in equations (14) and (24) represent the necessary and sufficient conditions for the manufacturer (P) and the distributors (D, F) to choose to deter parallel imports and maintain the foreign market when parallel imports are legally permitted. On the other hand, if (14) does not hold and (27) holds, it is the necessary and sufficient for the manufacturer (P) and the distributors (D, F) to choose to deter parallel imports by shutting down the foreign market altogether.

Figure 3 illustrates the necessary and sufficient conditions summarised above. Parallel imports may arise as an equilibrium outcome when both the domestic and the foreign markets are neither too similar nor too different in terms of size ($a(e^x) - \hat{a}$). When the markets are

too similar, parallel imports would not arise in equilibrium since P can exercise vertical control by raising the foreign retail price just enough to block parallel imports. On the other extreme, if the foreign market is sufficiently smaller than the domestic market, it would be more profitable for P to shut down the former by setting a very high wholesale price.¹⁷

Figure 3: Market size differences and the deterrence of parallel imports



For D 's market development effort across different conditions and legal regimes, the defining equations are given in (2), (4), (13) and (23). Figure 2, presented earlier, and Figure 4 below illustrate the difference between the effort levels satisfying the conditions in (4) and (23), and in (2), (4) and (13). When parallel imports are not permitted by law, the optimal level of D 's market development effort is identical to that under monopoly, which in turn is lower than that of the social planner. Now, suppose parallel imports are permitted by law. Then, first, if parallel imports are accommodated, the optimal level of D 's market development effort (e^*) is lower than that under monopoly (e^m), i.e., $e^* < e^m$. Second, if parallel imports are deterred but the foreign market is maintained, the optimal level of D 's

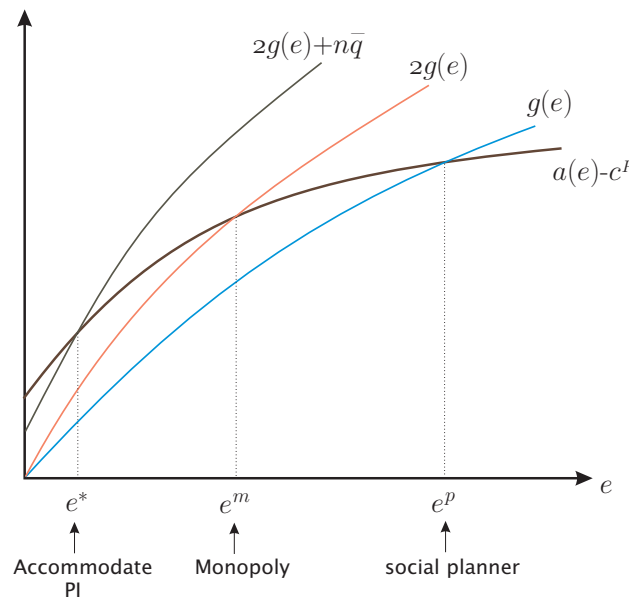
¹⁷ The crucial mechanism in the model that leads to this result is the two-part tariffs which allow P to share the joint profit via lump-sum transfer between D and F .

market development effort (e^x) is lower than that under monopoly (e^m), i.e., $e^x < e^m$.

However, e^x can either be lower or higher than e^* (the effort level when parallel imports are accommodated). Finally, if parallel imports are deterred and the foreign market is shut down, the optimal level of D 's market development effort is identical to that e^m (the monopoly case).

The intuition behind the results summarised above is straightforward. Once the law permits parallel imports, the best that D can do is to retain its monopoly position. This happens under case (iii). However, if parallel imports are accommodated, fringe firms would be able to free-ride on D 's market development effort. As a result, D would under-invest in it.

Figure 4: Optimum domestic market development effort



6. Conclusion

In this paper, we consider parallel importing as a vertical control problem. In particular, we analyse a model in which a single manufacturer who owns the intellectual property rights of a

single product controls the distribution of the product in two markets, domestic and foreign, using wholesale supply contracts that take the form of a two-part tariff. In addition, we consider the possibility of the domestic distributor in investing in market development efforts in order to increase sales and thus profits.

The model yields two interesting results. First, it shows that parallel imports can arise in a vertical control setting even if the IP owner has the ability of deterring parallel imports. Second, a legalisation of parallel imports generally has an adverse effect on the domestic distributor's market development effort. In particular, the domestic distributor would under invest in market development when faced with a market competition from the parallel importers. In fact, even if parallel imports can be deterred by the property right owners by setting a high enough price in the foreign market as the source of the parallel imported product, the domestic distributor still under invests in the market development efforts. In other words, the mere threat of parallel imports may have a similar negative effect. That is, even if the IP owner and distributors succeed in deterring parallel imports, the domestic distributor may still under invest. This results in a lower social welfare.

Furthermore, our result also shows that parallel imports cannot arise as an equilibrium outcome of the game if the two markets differ greatly in size, or if they are too similar in size. In the former situation, the foreign market will be shut down by the IP owner through its supply contract with the foreign distributor. In the latter case, the IP owner sets a high foreign wholesale price so that parallel imports become unprofitable, but the foreign market is not shut down.¹⁸ Second, our results also show that the presence of parallel imported products reduces the domestic distributor's market development investment.

¹⁸ Given that the two markets are similar in size, the IP owner needs only to set a wholesale price that is slightly higher than that under unconstrained (i.e., not having to worry about parallel imports) profit maximisation.

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