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Parallel imports, product innovation and market structures

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ABSTRACT

This paper sets up a two-country model in which there is one domestic manufacturer authorizing its product to a distributor in a foreign country to investigate the effect of parallel imports (PI) on product innovation of the former. The distributor can sell the product not only to its own market (i.e., the foreign market) but also back to the domestic market if parallel imports are allowed by the domestic government. We find that if the manufacturer adopts a two-part tariff pricing scheme when selling its output to the foreign distributor, permitting PI necessarily decreases the manufacturer's product innovation. This result however is very sensitive to market structures. If the domestic market becomes duopolistic or oligopolistic, the above result is definitely reversed—PI has a positive effect on the manufacturer's product innovation. Finally, if there are more than one distributor in the foreign market, parallel imports may increase or decrease product innovation depending on the consumers' quality valuations in the two countries.

1. Introduction

Parallel import (PI) occurs when a genuine product is sold back by licensed foreign distributors without the permission of the domestic intellectual property owner who, we call it the manufacturer hereafter, also serves the domestic market.

PI has been popular and observed in many products since 1980s. For example, the value of PI in the US rose from 7–10 billion USD in the mid-1980s to 20 billion USD in the 1990s (Cespedes, Corey, and Rangan, 1988; Computer Reseller Computer Reseller News, 2001). The US is not the only country encountering PI. According to the House of Commons report (1999), the volume of PI in the UK's motorcycle market was around 25% of the sales in 1999.[1] EU also suffers approximate $3 billion sales per year owing to the occurrence of PI (Ganslandt and Maskus, 2004). Furthermore, according to the First Sale Doctrine of the U.S. copyright law, it was illegal to import or resell the American copyright items. However, not until recently, the Supreme Court of the United States voted for the rule that textbooks and other goods made and sold abroad can be re-sold online and in discount stores without violating the U.S. copyright law.[2] It means that the First Sale Doctrine is not applicable to PI and U.S.-made items such as textbooks, CDs, and computer software purchased from foreign markets can be brought back to the U.S. for resale. Besides, there are numerous American-made cars sold back from Canada and Mexico every year. PI is also legal in other countries such as Australia, China, Japan, New Zealand, Singapore, and Taiwan.

PI has attracted substantial attention and been investigated extensively in the literature. The main focus along this strand of research is on optimal PI policies (see, for example, Maskus and Chen, 2004; Chen and Maskus, 2005; Kao and Peng, 2009; Mueller-

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[1] Please refer to the following website for details: http://www.parliament.the-stationery-office.co.uk/pa/cm199899/cmselect/cmtrdind/380/38007.htm.
[2] Please refer to the following website for details: http://seattletimes.com/html/politics/2020593063_apussupremecourtcopyrights.html.

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Langer, 2012; Mukherjee and Zhao, 2012, among others). Maskus and Chen (2004) utilize a two-country and two-firm Cournot model with a linear demand to investigate the optimal quantitative control of PI for an import country. They show that restricting parallel trade has an ambiguous welfare effect, depending on the trade cost of PI. Chen and Maskus (2005) reach a similar result with a general demand function. Mueller-Langer (2012) extends Maskus and Chen (2004) by assuming that products are heterogeneous and the manufacturer adopts one-part tariff pricing. He shows that permitting PI has a positive effect on the global welfare if the difference of the market sizes between the two countries is large and trade costs are low. Furthermore, Mukherjee and Zhao (2012) find that PI is profitable for the manufacturer if there is a labor union in the domestic country. Kao and Peng (2009) construct a three-country model to discuss the optimal quantitative regulation for PI. They show that if the manufacturer engages in price discrimination, the optimal PI policy is that of partial regulation and PI may decrease the global welfare if the manufacturer adopts two-part tariff pricing.

Another strand of the literature on PI shows that its effect on the manufacturer's process innovation depends on the trade cost (Li and Maskus, 2006; Li and Robles, 2007) or the degree of the horizontal product differentiation (Li and Robles, 2007). Nevertheless, empirical evidences have shown that process R&D can only represent a minor part of the reality.[3] The effect of PI on product innovation remains an important issue to be further addressed in the literature. Matteucci and Reverberi (2014) find that PI may stimulate the manufacturer's product innovation, depending on consumers' preferences for innovation between the two countries.

Our paper complements the literature in several ways. First, we consider the effect of PI on the manufacturer's product innovation by assuming the domestic manufacturer sells its product to the foreign distributor via two-part tariff pricing. Second, we explore the effect of local rivals in the domestic market, which is commonly observed in the real world but has been overlooked in this line of research. Third, we consider the case in which the manufacturer has multiple distributors in the foreign market.

It is found that permitting PI necessarily decreases the manufacturer's product R&D incentive if the domestic market is monopolized by the manufacturer. However, PI necessarily stimulates product innovation of the manufacturer if it faces local rivals. In addition, If the manufacturer can authorize its product to multiple foreign distributors, it is found that the incentive of product innovation can be either positively or negatively affected by PI, depending on consumers' preferences for innovation in the domestic and the foreign markets.

The remainder of this paper is organized as follows. Section 2 introduces the basic model and examines the optimal product innovation with no PI. Section 3 investigates the effect of PI on the manufacturer's product innovation. Section 4 explores the product innovation of the manufacturer when it faces domestic rivals or authorizes its product to multiple distributors. Section 5 concludes the paper.

2. Product innovation with no parallel imports

Assume that there are two countries, a home country and a foreign country, hosting one firm each. A manufacturer, located in the home country, sells $\times$ units of its product to its own (i.e., the home) market. The manufacturer also sells its product to the foreign market via an authorized foreign distributor. The distributor may engage in parallel trade, selling y^* to the foreign market and x^* back to the home market, if the home government adopts the international exhaustion rule (i.e., allowing parallel trade). Contrarily, PI does not occur and $x^* = 0$ if the home government endorses the national exhaustion rule.

When producing the product, the manufacturer incurs a constant marginal cost, c. Trade costs and retailing costs are assumed to be zero for simplification.[4] The manufacturer charges two-part tariff pricing (i.e., a fixed fee, T plus a wholesale price, w), when selling the product to the foreign distributor. Furthermore, the manufacturer engages in product innovation θ and its R&D cost function is specified as $V(\theta)$ with $V_\theta > 0$ and $V_{\theta\theta} > 0$. The inverse demand functions of the home and the foreign markets are assumed to be $p = p(x + x^*, \theta)$ and $p^* = p^*(y^*, \theta)$ with $p_x = p_{x^*} < 0$, $p^*_y < 0$, $p_\theta > 0$, and $p^*_\theta > 0$ and the second derivatives of the demands are assumed to be zero. Subscripts are used to denote derivatives.

The game in question consists of three stages. In the first stage, the manufacturer determines its optimal product innovation level. In the second stage, taking the product quality as given, the manufacturer chooses its optimal pricing contract (w plus T) and offers it to the foreign distributor. In the third stage, the manufacturer and the foreign distributor determine their optimal sales in the two markets with or with no PI. The sub-game perfect Nash equilibrium will be solved via backward induction. In this section, we shall investigate the case under national exhaustion (i.e., the no PI regime) and then, in Section 3, examine the international exhaustion case (i.e., the PI regime).

Under the national exhaustion regime, the foreign distributor is not allowed in reselling the product back to the home market. Under such a circumstance, the home and the foreign markets are monopolized respectively by the manufacturer and the foreign distributor. Accordingly, the profit functions of the manufacturer and the foreign distributer can be respectively expressed as follows:

$$\pi(x; w, T, \theta) = [p(x, \theta) - c]x + (w - c)y^* + T - V(\theta), \tag{1}$$

$$\pi^*(y^*; w, T, \theta) = (p^* - w)y^* - T. \tag{2}$$

[3] For example, Cohen, Nelson, and Walsh (1997) show that 51.5% of the innovations in the American manufacturing sector between 1991 and 1993 are those of product innovations and only 33% are of process innovations. Arundel and Kabla (1998) also find that the percentage of innovations is made for product innovations is 35.9%, and it is 24.8% for process innovations in Europe's industrial firms.

[4] This is for mathematical simplicity and does not change the qualitative results of the paper.