



On price discrimination, parallel trade and the availability of patented drugs in developing countries

Mainak Mazumdar^{a,*}, Dyuti S. Banerjee^b

^a Centre de Sciences for Humaines (CSH), New Delhi, India

^b Department of Economics, Monash University Clayton, Victoria 3800, Australia

ARTICLE INFO

Article history:

Received 26 February 2009

Received in revised form 4 January 2012

Accepted 4 January 2012

JEL classification:

F19

K19

L11

R30

Keywords:

Parallel trade

Patent

Price discrimination

ABSTRACT

This paper examines the effect of product Patent Act and parallel trade on the availability of an essential drug in the developing countries. Price discrimination by a Multinational Corporation (MNC) alleviates the problem of non-availability of the drug in a developing country compared to uniform pricing strategy. Incorporating an upstream–downstream market structure we show that in the presence of parallel trade ‘a form of arbitrage’ by traders the MNC cannot successfully discriminate the prices for its product. The analysis however, indicate that if the market size of the developing nation is relatively large, then with Cournot competition among the traders, the manufacturer earns higher profit by allowing parallel trade than by perfectly discriminating the prices for its product. Under Bertrand competition, the strategy to allow parallel trade always dominates the strategy to restrain it.

© 2012 Elsevier Inc. All rights reserved.

1. Introduction

Under the World Trade Organization (WTO) agreement on the Trade-Related Aspects of Intellectual Property Rights (TRIPS), India amended her Patent Act and recognized product patent in 2005. The recognition of product patent is a highly controversial issue, as it has implications for the availability of patented drugs in India.

Historically product patent was in force in India in the earlier version of the Patent Act of 1911. In that regime, the foreign multinational companies (MNCs) held most of the patents in India and the drug manufacturing was mainly concentrated in their hands. The MNCs imported the basic ingredients (bulk drugs) and sold the final products (formulations) at higher prices in India. Concerned by the high prices of drugs and the lack of domestic investment, the Government of India amended the Patent Act of 1911 and the Patent Act of 1970 came into force.¹

* Corresponding author.

E-mail addresses: mainak@csh-delhi.com, mainakecon@gmail.com (M. Mazumdar), dyuti.banerjee@monash.edu.au (D.S. Banerjee).

¹ The Government of India constituted the *Ayyangar Committee (1959)* to look into the problems of the domestic pharmaceutical industry. The Committee pointed out that the foreign companies held about 80–90 percent of the patents and more than 90 percent of the products covered by patents are not even produced in India. The committee concluded that the multinationals exploited the monopolistic market condition created by the patent law particularly for the chemical and

The amended Patent Act of 1970 recognized only process patent and that too for a short period of around five to seven years. The flexible provision of the Patent Act of 1970 enabled the Indian companies to imitate the patented products of the foreign companies, master the technique of reverse engineering, and in most cases emerged with even better process technology for the same product. The comparative advantage of the industry is therefore an outcome of the Patent Act of 1970, which favorably impacted the Indian industry to create a niche for itself (*Chaudhuri, 1997, 2004; Kumar & Pradhan, 2002*). Today the Indian pharmaceutical companies are the largest producers in the global generic market.² They rank fourth in terms of the value in the global pharmaceutical market and can produce almost all varieties of drugs at a low price.³

However, the change in the institutional set up due to the recognition of product patent in the Patent Act of 2005 has evoked considerable debate among scholars and policy-makers. *Chaudhuri (2003, 2005), Lanjouw (1997), Watal (1999, 2000)* and others argue that with product patent in force, the Indian generic

pharmaceutical industries. It therefore, recommended that certain inventions in these industries be granted only for process patent protection.

² Off-patented products are known as generic product. Because product patent has been recognized in many developed countries, the Indian companies can target their market only after patent expiry.

³ *FICCI Report (2005)*.

pharmaceutical companies will be unable to imitate the patented products of the foreign companies. This may lead to the problem of non-availability of such drugs for the Indian consumers in the long run. The other side of the argument is that if patent law is appropriately implemented then the threat of imitation will be reduced. This may induce the MNCs to explore the large Indian market to sell their products. This means the availability of new drugs which Indian companies are unable to produce. In recent years due to the escalating cost of research and development and a fall in the R&D productivity, the global pharmaceutical firms are also keen to cut their production cost (Cockburn, 2004). Thus if product patent is ensured, India can be an attractive destination for the MNCs to relocate their manufacturing base because of its low cost of production and superior manufacturing facilities. This in turn may also generate additional employment opportunity.

Additional market opportunity or low cost of production, however, may not provide sufficient incentives to the MNCs to establish their production units or even to supply their products to a country like India. This is because an MNC's decision to supply its product is also based on the level of demand for the product in that country. If a firm charges uniform price for its product across the globe, then it may not be optimal for it to supply the product in a developing country if the demand and the price is low.

But in reality firms do price discriminate for different markets across the globe because demand elasticities and the willingness to pay for drugs differ across countries due to income differentials. For example, in 1998 the U.S. House of Representatives Minority Staff International Report indicated that the US prices of the drug to be 72 percent higher than those in Canada and 102 percent higher than those in Mexico. Pérez-Casas (2000) shows that the prices of HIV AIDS drug in developing countries is as low as to the order of about one-fifth of the US prices. Studies by Danzon and Kim (1998), Danzon and Chao (2000), Danzon and Furukawa (2003), USITC (2000) also indicate that price differences of the drug are generally consistent with income differences of the countries concerned. According to Scherer and Watal (2002), the effect of income on the prices of the drug is gradually increasing over time in developing countries. In the Indian context the drug prices are even lower compared to other developing countries as shown in Table A1 in Appendix A.⁴

However, successful price discrimination is possible only when the possibility of arbitrage opportunities across nations is controlled. This problem is popularly known as the problem of "Parallel Trade" (Fink, 2000; Gallus, 2004; Maskus, 2000, 2001) in the patent literature and the possibility emerges when a trader from a low priced drug market resells it in another market at a high price. One way to control such practices is through legal measures. However, the legal treatment for parallel trade varies from country to country, for example, Australia, Hong-Kong and India allows parallel trade whereas in US and Japan it is legally banned (Ganslandt & Maskus, 2007). Given the wide differences in the legal structure of the countries to deal with parallel-trade, it is sometimes difficult for a company to control the cross-border trade in goods through legal routes.

On the backdrop of the empirical evidences on price discrimination and parallel trade, in this paper we present only the scenario after the Patent Act has been implemented, in order to identify the conditions under which the drug is most likely to be available in

the developing country. We analyze the following issues, which to the best of our knowledge is yet to be addressed in the literature. We first study the impact of price discrimination on the availability of a drug in a developing country. Marjit and Beladi (1998) show that the problem of availability of a patented drug becomes more acute when local producers cannot imitate due to the Patent Act under the assumption of uniform price charged by the firms. Then we analyze whether it is profitable for an MNC to have the production base in a developing country and allow parallel trade or confine the operations only in the developed country. Within this model, the downstream firm of the developing country undertakes parallel trading. Lastly we discuss whether vertical restraints should be imposed to ban parallel trade.

Our findings suggest that price discrimination alleviates the problem of non-availability of a patented drug compared to the uniform pricing strategy. To address the issue of parallel trade we consider an upstream–downstream market structure where the drugs are sold at the retail level through distributors. With quantity competition among the downstream firms, we show that it is profitable for an MNC to establish the production facility in a low cost developing country and allow parallel trade rather than confining its operation only in the developed country if the market size of the developing country is relatively large. In this case the MNC prefers to have parallel trade rather than preventing it through some vertical restraints. With price competition among the downstream firms the above results not only hold but are independent of the market size of the developing country.

This paper is organized as follows. In Section 2 we discuss the model. In Section 3 we consider an upstream–downstream market structure and introduce parallel trade. Section 4 provides empirical evidences on parallel trade. Section 5 contains the concluding remarks.

2. The model

We consider two possible markets, one in a developed country (d) and the other in a developing country market (dl). A manufacturer M produces a patented drug in d at a constant marginal cost c_m . We assume there is no fixed cost of production. M has the option of selling the drug either only in d or in both d and dl . Following Marjit and Beladi (1998) the demand functions in a country i is as follows.

$$q_i = (a_i - p_i), \quad i \in \{d, dl\} \quad (1)$$

q_i and p_i are the quantity and price in country i , and we assume that the buyers' willingness to pay in d is higher than that in dl , which implies that $a_d > a_{dl}$. M can either charge a uniform price in the two countries or can price discriminate which is possible given that the two countries have different identifiable demand curves.

The equilibrium price, output and profit of M from price discrimination are $p_i^{PD} = (a_i + c_m)/2$, $q_i^{PD} = (a_i - c_m)/2$, and $\pi_i^{PD} = (a_i - c_m)^2/4$ where $i \in \{d, dl\}$ and the superscript "PD" denotes price discrimination. So M 's overall profit from price discrimination is $\pi^{PD} = ((a_d - c_m)^2/4) + ((a_{dl} - c_m)^2/4)$. From this we see that under price discrimination M serves both the markets if $a_{dl} > c_m$.

Under uniform pricing M faces the following market demand function.

$$q = \begin{cases} (a_d - p), & \text{for } p \geq a_{dl}, \\ (a_d + a_{dl} - 2p), & \text{for } p \leq a_{dl}. \end{cases} \quad (2)$$

q in Eq. (2) denotes the total quantity in the two markets. The first part of Eq. (2) shows that if the market price is at least as much as the willingness to pay of the consumers in dl then only d is served by M . Otherwise both the markets are served which is shown by

⁴ The low drug prices in India may not be entirely due to income effect. Historically, the lack of product patent led to a highly competitive and vibrant pharmaceutical industry in India that has been involved in various cost reducing innovative activities. Consequently, Indian prices are seen to be lower than other developing nations such as Pakistan whose per-capita income is indeed lower compared to that of India.

متن کامل مقاله

دریافت فوری ←

ISIArticles

مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات