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# PARALLEL TRADE OF PATENTED PHARMACEUTICALS IN DEVELOPING COUNTRIES

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***Abstract-****As recently reported by the World Health Organization (WHO), access to essential medicines remains a challenge for most people in developing countries like india. Researchers have found that the reasons for this situation result from the low availability and unaffordable prices of medicines while, at the same time, people in those countries are seriously suffered by devastating diseases. Generic drugs could be the difference between life and death for millions of people in developing countries. This paper prescribes a uniform pricing policy adopted by the Multinational Corporation (MNC) that produces the drug. Allowing for price discrimination and comparing with the above situation, we can say that the problem of non-availability of a patented drug is indeed much less serious. However, successful price discrimination is not possible when markets are not perfectly segmented and "parallel – trade", by the distributors exist. The article ends with proposals for developing countries to utilize the parallel trade of pharmaceuticals as a useful tool for access to essential medicines in order to combat the devastation resulting from epidemic diseases, and for building up national pharmaceutical industries, and parallel trade should include compulsory licensing of pharmaceutical related patents as well as technology transfer in the field of pharmaceuticals.*

***Keywords :*** *product patent; price discrimination; parallel trade; multinational companies*

## II. INTRODUCTION

India was attractive to foreign firms mainly due to its large market and increasing demand for drugs. At that time there was lack of competition in the Indian pharmaceutical industry and the MNCs did well in India. They had good knowledge and technology to develop antibiotics and synthetic drugs and advantage of their financial assets and management abilities. Consumer preference for foreign world- wide known drugs was also an advantage for the MNCs in India. They were aggressive in marketing and managed to create a market for themselves in branded products. The foreign companies had, more or less, a monopoly in the Indian pharmaceutical market at this time. After decades of isolation and restrictions on FDI, in 1991, India opened its economy for foreign firms and investors to integrate the country with the rest of the world

**Generic Drugs**-Generic drugs marketed without brand names are generally less expensive than brand-name drugs, even though they are chemically identical to brand-name drugs and meet the same

standards of the FDA (US Food and Drug Administration) for safety, purity and effectiveness. Generic drugs can be legally produced in the countries if a patent has expired, or for drugs which have never been patented. The expiration of a patent removes the monopoly of the patent holder on drug sales licensing.

## III. OBJECTIVE

Parallel Trade was established in the Trade-Related Intellectual Property Rights Agreement 1994 (TRIPS Agreement) and re-affirmed in the Doha Declaration on TRIPS Agreement and Public Health 2001 (Doha Declaration), parallel trade in patented pharmaceuticals has so far been one of the most heatedly debated topics. Multi-national pharmaceutical companies complain that parallel trade of patented pharmaceuticals denies them adequate protection of their patent rights and prevents them from recouping the costs of pharmaceutical development including research and development (R&D), regulatory approval and amortization of the cost of unsuccessful drug development. In contrast, the developing (and least developed) countries, suffering from the burdens of high disease levels and lack of resources to pay for high priced medicines, support liberalization of the parallel trade in patented pharmaceuticals to fulfil basic human needs. In addition, developing countries have a greater focus on consumer interests, social welfare and health care policy concerns. The puzzle, therefore, is how to fully understand the differences and how to harmonize the interests of the multi-national pharmaceutical companies with those of developing countries.

## IV. PARALLEL TRADE

Price discrimination is possible only when the possibilities of arbitrage from the low price market to high priced market is controlled. The problem is popularly known as the problem of parallel trade in patent literature and it emerges when trader from the country where the product is sold at low price, resells it in the market with high price. The doctrine says that once a producer of a patented product or its agent has sold its product, the patent holder losses his or her right to dictate or control any conditions under which the product is resold. "Exhaustion means that once a patent holder has sold a patented invention, the patent

holder has no further right to exclude others from subsequent use, including offering to sell or distribute the patented invention. In essence, exhaustation presupposes that the patent owner, unless there is an agreement to the contrary, implicitly licenses the subsequent use and resale of a patented product upon first sale" (Gathii, 2002).

## V.IMPLEMENTATION OF PARALLEL METHOD

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" (Gallus, 2004; Maskus, 2000, 2001; Fink, 2000) in the patent literature and the possibility emerges when a trader from a low priced market for the drug 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,
Clearly even in the presence of parallel trade the MNC can supply a medicine at a comparatively lower price in the developing country if the profit it realizes under such circumstances is higher than the profit it earns by solely operating in the developed country. The question that arises is under what condition this can happen? We have shown in our model that this can happen only if the relative market size of the developing nation is more than half the size of the developed nation.

### 5.1 The Analytical Model

The basic model under consideration is that of the Marjit and Beladi (1998). There are two possible markets in the economy viz. a developed country market denoted by $M_d$ and a developing country market denoted by $M_{dl}$. Manufacturer "F" located in the developed country market produces a patented life saving drug, which is an outcome of the R&D undertaken by it. The manufacturer has the option of selling the product only in $M_d$ or to sell the product both in $M_d$ as well as in $M_{dl}$. As with Marjit and Beladi (1998) let us consider the following simple demand functions for the product,

$q = (a_1 - p)$ for $M_d$ ---(1)

and, $q = (a_2 - p)$ for $M_{dl}$ --- (2) where $a_1 > a_2$ are the intercepts of the demand curves, and $q =$ quantity demanded and $p =$ price of the product.
For simplicity we assume that the cost of production is represented by constant marginal cost (=average cost) $c_m$. For simplicity, we also assume that there is no fixed cost of production in our model. The manufacturer "F" has two options before her, to supply the product in the market of $M_{dl}$ by charging a uniform price $(P_U)$ in $M_d$ and $M_{dl}$ or to supply the product with price discrimination $(P_d)$. It is likely that a profit-maximizing manufacturer would adopt price discrimination strategy if faced with different elasticity's of demand in two separate markets.

### 5.2 Price Discrimination

Manufacturer "F" while maximizing her profit under price discrimination takes into account the two different demand functions, one for $M_d$ and another for $M_{dl}$, separately. With price discrimination, let us assume that manufacturer "F" faces the profit functions $\Pi_d$ and $\Pi_{dl}$ by serving the market of $M_d$ and $M_{dl}$. At this stage we assume away any arbitrage from the low cost to the high cost market. Maximization of $\Pi_d$ and $\Pi_{dl}$ then results the following proposition.
Proposition 1: If $a_2 > c_m$ then the manufacturer "F" will always serve the market of $M_{dl}$ with price discrimination.

Proof: We have, $\Pi_{dl} = [a_2 q - q^2 - c_m q]$ - (3)

From the First order condition (F.O.C.) $\frac{d\Pi_{dl}}{dq} = 0$ we get the following equilibrium price and quantity, $q_{dl} = \frac{a_2 - c_m}{2}$, where $q_{dl} =$ quantity served in $M_{dl}$ - (4)

and $p_{dl} = \frac{a_2 + c_m}{2}$, where $p_{dl}$ = price charged in $M_{dl}$ -(5)

And, $\Pi^0_{dl} = \frac{(a_2 - c_m)^2}{4}$ where $\Pi^0_{dl}$ = profit earned by serving the market of $M_{dl}$

$\Pi^0_{dl} > 0 \Rightarrow a_2 > c_m$ . (6)

Because of similar demand structure, we can also argue that the profit "F" earns from the market of $M_d$ will be $\Pi^0_d = \frac{(a_1 - c_m)^2}{4}$. Therefore, the total profit the manufacturer earns with price discrimination strategy ($\equiv \Pi^{Pd}$) by serving both the market is

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$$\Pi^{Pd} = \frac{(a_2 - c_m)^2}{4} + \frac{(a_1 - c_m)^2}{4} \quad -(7)$$

If however, the manufacturer charges uniform price for her product in $M_d$ and $M_{dl}$ it faces a combined demand functions for both the countries. Maximizing her profit function under the strategy of uniform pricing then results in the following proposition.

Note 1: Clearly if $a_2 < c_m$, no drug can be sold in the developing country, the price discrimination exercise loses meaning and we arrive at a trivial case. In order to examine the non-trivial cases, we have attempted in this paper to derive conditions under which an MNC will serve both the markets.

Proposition 2: Let A be the set of values of $a_2$ for which positive profit is earned when uniform price is charged in both the markets and B be the set of values of $a_2$ for which positive profit is earned under price discrimination, then $A \subseteq B$.

Proof: When uniform price is charged the relevant demand curves faced by the manufacturer is as follows

$$q = (a_1 - p) \quad \text{for } p > a_2$$

$$q = a_1 + a_2 - 2p \quad \text{for } p < a_2 \text{ -(8)}$$

$$\text{And } \Pi_U = \left[\frac{a_1 + a_2}{2} q - \frac{1}{2} q^2 - c_m q\right]$$

F.O.C. requires $\frac{d\Pi_U}{dq} = 0$,

$$\Rightarrow q^o = \frac{a_1 + a_2}{2} - c_m$$ where $q^o$ = profit maximizing quantity produced by charging the uniform price in $M_d$ and $M_{dl}$.

$$\therefore \Pi_U^O = \frac{1}{2}\left(\frac{a_1 + a_2}{2} - c_m\right)^2$$, where $\Pi_U^O$ is the profit earned by charging uniform price in $M_d$ and $M_{dl}$ -(9)

If the manufacturer serves, only $M_d$ she will enjoy profit of

$$\Pi_d^0 = \frac{(a_1 - c_m)^2}{4}$$ (see proposition 1)-(10)

Now the condition under which the "F" will serve $M_{dl}$ can be derived a

$$\frac{(a_1 - c_m)^2}{4} < \frac{1}{2}\left(\frac{a_1 + a_2}{2} - c_m\right)^2 \text{-(11)}$$

$$\Rightarrow \left[\frac{a_1(\sqrt{2} - 1) - a_2}{\sqrt{2}} + (\sqrt{2} - 1)c_m\right] < 0 \text{ - (12)}$$

With further manipulation we get

$$a_2 > (2 - \sqrt{2})c_m + a_1(\sqrt{2} - 1) \text{ - (13)}$$

Therefore

$$A = \{a_2 : a_2 > (2 - \sqrt{2})c_m + a_1(\sqrt{2} - 1)\}$$

From Proposition we have $B = \{a_2 : a_2 > c_m\}$

To prove A $\subseteq B$ we need to prove that

$$(2 - \sqrt{2})c_m + a_1(\sqrt{2} - 1) > c_m$$

or

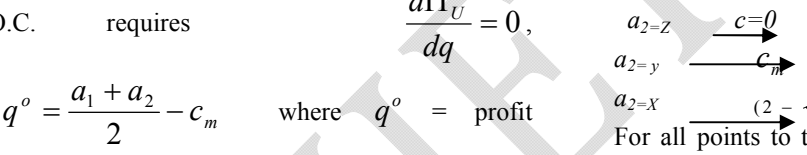
$$\sqrt{2}(a_1 - c_m) - (a_1 - c_m) > 0 \quad \text{-(14)}$$

which is always true

Hence A $\subseteq B$ Q.E.D.

Proposition 2 can also be visualized with the help of a line diagram depicted in figure 1. The figure plots the different values of $a_2$ for which "F" serves the market of $M_{dl}$ with her patented product for alternative pricing strategies. Under the strategy of uniform pricing when $a_2 = (2 - \sqrt{2})c_m + a_1(\sqrt{2} - 1)$ the manufacturer is indifferent between serving and not serving the market of $M_{dl}$. Let us denote this value of $a_2$ as X.

Figure 1: Range of values of $a_2$ for which the manufacturer serves the market $M_{dl}$ with price discrimination and uniform pricing strategy




For all points to the left of X, the manufacturer will not serve $M_{dl}$ with uniform pricing. When $a_2 = c_m$, the manufacturer is indifferent between serving and not serving the market of $M_{dl}$ with price discrimination. Let us denote this value by of $a_2$ by Y. At all points to the right of Y, $a_2 > c_m$ and the manufacturer serves $M_{dl}$ with price discrimination. On the line diagram, it also includes all the points to the left of X. Therefore, with price discrimination the manufacturer serves the market of $M_{dl}$ for a greater range of values of $a_2$. This is precisely what we have derived mathematically.

Based on our analysis, we can then infer that the possibility of non-availability of the patented drug in the developing country reduces under price discrimination. The problem persists even if after product patent the condition $a_2 < c_m$ holds.

**5.3 Compulsory Licensing**

It would appear that the 'safeguard' of compulsory licensing serves to restrict the monopoly rights given to patent holders and therefore would assist in the availability of generic drugs. In basic terms a

compulsory license means that the government of a WTO Member country can grant licenses to a government agency or company for the production or importation of a patented drug without the permission of the patent holder in situations of national emergency, or for exporting medicine to countries facing public health emergencies. The legal basis for compulsory licensing is found under Article 31 TRIPS.

## VI. CONCLSION

In this paper we have theoretically examined the forthcoming issues; the problem of non-availability of a patented drug in the developing countries due to and product patent has been examined by introducing the option of price discrimination strategy by an MNC. It is proved that if an MNC can discriminate the price for its product across the globe the problem of non-availability of the drug is reduced. Further, if local cost of production is sufficiently low, a developing country can be an attractive location for an MNC to shift its production base. The problem of non–availability of the drug then gets further reduced. It can also be argued that after relocating its production plant in the developing country, an MNC can charge lower price and can supply the drugs to other poor countries as well where the level of demand is even lower (at each price level) due to low purchasing power. This in turn can generate additional employment opportunities in the developing country where production facility is located. Consequently, welfare level in the country concerned will increase. In addition, developing countries have a greater focus on consumer interests, social welfare and health care policy concerns.

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