Journal of International Economics 87 (2012) 262–276

Contents lists available at SciVerse ScienceDirect

Journal of International Economics

journal homepage: www.elsevier.com/locate/jie

Equilibrium parallel import policies and international market structure☆

Santanu Roy [a,1], Kamal Saggi [b,*]

[a] Southern Methodist University, Dallas, TX, USA
[b] Vanderbilt University, Nashville, TN, USA

ARTICLE INFO

Article history:
Received 24 January 2011
Received in revised form 3 January 2012
Accepted 19 January 2012
Available online 27 January 2012

JEL classification:
F13
F10
F15

Keywords:
Parallel imports
Oligopoly
Quality
Product differentiation
Market structure
Welfare

ABSTRACT

In a North–South vertically differentiated duopoly we analyze (*i*) the effects of parallel import (PI) policies on price competition and (*ii*) the interdependence of national PI policies. Prices can be higher in the North if both countries permit PIs relative to when only the South does. If governments maximize national welfare and demand asymmetry across countries is sufficiently large, the North forbids PIs to ensure its firm sells in the South and international price discrimination — the South's most preferred market outcome — obtains. When demand structures are relatively similar across countries, the North permits PIs and uniform pricing — its most preferred outcome — results.

1. Introduction

Parallel trade is said to occur when a product protected by some form of intellectual property right (IPR) offered for sale by the rights holder in one country is re-sold in another country without the right holder's consent. As is clear, the incentive to engage in such trade naturally arises in the presence of significant international price differences, which in turn often reflect the underlying market power of sellers (Scherer and Watal, 2002).

The possibility of parallel trade affects firm behavior and pricing in many markets, perhaps the most important of which is the market for pharmaceuticals.[2] A recent article published in the *Financial Times* noted that several billion dollars of parallel trade in pharmaceuticals occurs within the European Union (EU) annually and that such trade accounts for roughly 10% of Europe's medicine trade.[3] The biggest destination markets tend to be Germany, UK, Netherlands, Denmark, Sweden, Ireland, and Norway — some of the richest countries in Europe where prices generally tend to be the highest. As one might expect, the important parallel exporters are Greece and Spain — countries where prices of medicines are lower than the EU average. Kanavos et al. (2004) document the increased importance of PIs in the EU pharmaceutical market. They find that from 1997 to 2002, the share of PIs as a percentage of the total pharmaceutical market increased from under 2% to 10.1% in Sweden and from 1.7% to about 7% in Germany. On the export side, Greece's share of parallel exports increased from under 1% to 21.6% over the same time period. Impressive as these figures are, it is worth emphasizing that the observed flows of parallel trade need not be large for *PI policies to matter*

☆ For helpful comments and discussions, we thank two anonymous referees, editor Bob Staiger, Kyle Bagwell, Rick Bond, Petros Mavroidis, Hodaka Morita, Nathan Nunn, Abhijit Sengupta, seminar audiences at Princeton, Syracuse, St. Louis Fed, Stanford, UC-Santa Cruz, the University of Sydney, the University of New South Wales, Vanderbilt, the Spring 2010 Midwest International Economics Meeting, and the Stony Brook 2011 Workshop on the Applications of Game Theory to Trade and Development. Parts of this paper were written during Kamal Saggi's visits to the Stanford Center for International Development (SCID) and the World Bank's Development Economics Research Group in Trade and Integration (DECTI); he is grateful to the affiliated researchers and the administrative staff of SCID and DECTI for their hospitality and support.

* Corresponding author at: Department of Economics, Vanderbilt University, Box 1819-Station B, Nashville, TN 37235-1819, USA. Tel.: +1 615 322 3237.
E-mail addresses: sroy@smu.edu (S. Roy), k.saggi@Vanderbilt.Edu (K. Saggi).
[1] Department of Economics, Southern Methodist University, 3300 Dyer Street, Dallas, TX 75275-0496, USA. Tel.: +1 214 768 2714.

[2] Parallel trade occurs in footwear and leather goods, musical recordings, cars, consumer electronics, domestic appliances, cosmetics, clothing, soft drinks, and several other consumer products (NERA, 1999).

[3] See "European drug groups fear parallel trade" *Financial Times*, June 7, 2010.

0022-1996/$ – see front matter © 2012 Elsevier B.V. All rights reserved.
doi:10.1016/j.jinteco.2012.01.007

because firms will tend to make different pricing decisions when such trade is permitted relative to when it is not.[4]

Discussions regarding PI policies tend to be quite charged in the context of pharmaceuticals and perhaps for a good reason. The issue has often been heavily politicized in most countries, including the United States where it has been debated repeatedly over the years in Congress. For example, an article published in the *Wall Street Journal* on Dec 16, 2009 reported that a measure to allow importation of prescription drugs from abroad fell short in the US Senate by just 9 votes. The bill was sponsored by Senator Byron Dorgan of North Dakota who argued that his motivation was to protect consumer interests since "…the American people are charged the highest prices in the World". The pharmaceutical industry opposed the bill questioning the safety of imported drugs. While safety maybe a legitimate concern, there is little doubt that the primary issue for firms is the ability to maintain high prices in the United States.

Goldberg (2010) has argued that the practice of "global reference pricing" on the part of some rich countries and the possibility of PIs can induce pharmaceutical multinationals to not serve low income countries and/or raise their prices (even above their optimal monopoly prices) in such markets — outcomes that emerge quite sharply in our model. For example, multinational firms frequently refrain from introducing new drugs in India because the foregone profits in the Indian market are trivial relative to the profits that would be lost in Canada and many European countries if Indian prices were used as a reference point by these countries while determining local prices (Goldberg, 2010). More generally, using data regarding drug launches in 68 countries between 1982 and 2002, Lanjouw (2005) shows that the presence of price regulations and global reference pricing in the industrialized world contributes to launch delay in developing countries. In a similar vein, Danzon and Epstein (2008) find that the delay effect of a prior launch in a high-price EU country on a subsequent launch in a low price EU country is substantially stronger than the corresponding effect of a prior launch in a low price EU country.

Whether or not PIs can flow into a country is a matter of national policy. A country can choose to permit PIs by adopting the legal doctrine of *international exhaustion* of IPRs under which such rights are deemed to expire globally with the first sale of the relevant product, regardless of the geographical incidence of the sale. On the other hand, a country can effectively ban PIs by adopting *national exhaustion* of IPRs wherein rights are held to expire only in the market of first sale thereby leaving the right holder free to prevent its resale in other markets. While national laws pertaining to parallel trade are complex and multi-faceted, the following characterization broadly captures the global policy spectrum: the two largest markets in the world — i.e. United States and the EU — forbid PIs of patented and copyrighted goods from most other countries whereas developing countries tend to vary widely in their restraints on such imports (Maskus, 2000).[5] This variation in national PI policies reflects unilateral policy decisions since presently there is no multilateral cooperation or consensus over policies pertaining to parallel trade. Indeed, the key multilateral agreement on IPRs — i.e. the WTO's Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS) — leaves member countries free to implement PI policies of their choice.

Given the lack of any multilateral consensus regarding the desirability of parallel trade, two important questions arise. First, how do national PI policies affect oligopolistic competition in global markets? Second, what is the nature of strategic interdependence between PI policies of individual countries? We address these questions in a North–South model in which the two regions differ with respect to their domestic demand structure and the quality of goods produced by their respective firms. In particular, the Northern firm's product is of high quality whereas that of the Southern firm is of low quality and market size as well as the relative preference for high quality is larger in the North. Not only do these stylized asymmetries capture empirically relevant differences between Northern and Southern markets, we show that they shed new light on the causes and consequence of parallel trade. Indeed, without properly accounting for such asymmetries, it is difficult to explain the observed variation in PI policies across countries.

The timing of decisions in our model is as follows. First, governments simultaneously decide whether or not to permit PIs. Next, each firm chooses whether or not to offer its product for sale in the foreign market. Finally, given policies and market structure, firms compete in prices and international trade and consumption occur. To the best of our knowledge, ours is the first paper to provide an analysis of PI policies in a model that incorporates strategic interaction not only in the product market but also at the policy-setting stage.

The existing literature on PIs has extensively explored uniform global pricing and international price discrimination by firms with market power. In addition to these symmetric market outcomes, an asymmetric scenario where the low quality sells in both markets while the high quality firm sells only in the North plays a crucial role in our analysis. Such an asymmetric market structure can arise in our model because the two firms have uneven export incentives: the lure of the lucrative Northern market is stronger than that of the Southern market. We find that the strategic price competition under such a market structure tends to be rather subtle. To gain further insight, suppose the North permits PIs while the South does not. Under such a policy configuration, if demand is relatively similar across countries the low quality firm charges its optimal monopoly price in the South while both firms charge their optimal discriminatory prices in the Northern market. However, if demand structure is sufficiently asymmetric across countries, the low quality firm's optimal monopoly price in the South is lower than its optimal discriminatory price for the Northern market. Under such a scenario, the North's openness to PIs induces the low quality firm to set a common international price that actually *exceeds* its optimal monopoly price for the Southern market: i.e. it tolerates a suboptimally high price in the Southern market to charge a more attractive price in the Northern market (Lemma 2). The resulting softening of price competition in the North, in turn, makes forsaking the Southern market more attractive for the Northern firm, because local demand for its product is relatively large. Indeed, we show that such an asymmetric market structure can arise not only when only one country permits PIs but also when both countries do so (Propositions 2 and 3).

Our policy analysis sheds new light on how heterogeneity in demand structure across countries determines national preferences for PI policies. We show that if governments maximize national welfare the North is more likely to permit PIs (i.e. it prefers to permit PIs over a larger parameter space) when the South does *not* do so. With its smaller market, the Southern government's influence on market structure tends to be weaker, something that is reflected in the nature of the policy equilibrium: if the North is open to PIs, the South also (weakly) prefers to be open to PIs whereas a Northern ban on PIs makes the South indifferent between its two policy options since it renders the Southern policy inconsequential for market structure.

The subgame perfect equilibrium of our model (stated in Proposition 6) is as follows: when the degree of asymmetry between the two markets is high and each government maximizes its national welfare, the North forbids PIs and international price discrimination

[4] In this regard, it is noteworthy that Gansland and Maskus (2004) found that after Sweden joined the EU and opened its pharmaceutical market to PIs, prices of drugs subject to competition from PI declined 12–19%.

[5] The US policy with respect to PIs of trademarked goods is relatively more open: it allows PIs of trademarked goods (such as cars) when the entities holding the US and the foreign trademark are the same or are in a parent–subsidiary relationship.