



# Import tariff, intellectual property right protection and foreign merger

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## ABSTRACT

This paper develops a model of four stages and three players, including the MNE, the corporation and the government of the host country, to analyze the effects of the intellectual property right (IPR) and the trade policies on FDI and social welfare of the host country during the process of privatization of the state-owned assets. Two conclusions emerge in the analysis: firstly, when the market size of the host country is relatively small, either a stronger IPR protection or a higher tariff can attract more FDI. Moreover, only under the condition of weak IPR protection is the government of the host country more likely to use higher tariffs to attract FDI; Secondly, when the market size of the host country is relatively large, neither stronger IPR protection nor higher tariff can attract more FDI, and the optimal tariff chosen by the government of the host country is decreasing in the level of IPR protection.

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## 1. Introduction

As global economic interdependence is becoming increasingly apparent, the WTO is calling on its member nations to continue negotiations on strengthening the intellectual property right (IPR) protection under the framework of Trade Related Intellectual Property Agreements (TRIPs), while cutting tariffs and lowering trade barriers (Forero-Pineda, 2006). Meanwhile, in the theoretical arena, a number of studies have been conducted to discuss the impacts of tariff and IPR policies on FDI inflow and social welfare respectively.

Firstly, as to the discussion on tariffs, traditional analysis has suggested that the higher the tariff is, the more likely will a MNE (Multinational Enterprise) choose FDI as its entry mode in order to jump over trade barriers (Svedberg, 1979). With a regression analysis of 1980 data of the EU countries, Neven and Siotis (1996) found that the major motive for American MNEs to conduct FDI in EU was to jump over trade barriers. A similar conclusion was reached by Belderbos and Sleuwaegen (1998) after analyzing the FDI behavior in EU by the Japanese electronic industry. However, some recent studies have begun to take on new perspectives. Establishing a model in which a MNE bids for a state-owned enterprise and then participates in Cournot competition in the host country's product market, Norback and Persson (2004) discovered that while increasing tariffs would lead to greater motivation of MNEs to conduct FDI to jump over tariff barriers, it would also stimulate the domestic enterprises to purchase state-owned enterprises in order to stop MNEs from becoming their strong competitors. Therefore, once tariffs exceed a certain critical value, the continual rise of tariffs would prevent foreign investments from flowing in.

Secondly, speaking of the impacts of IPR protection on FDI inflows and welfare level, it is commonly believed in traditional analysis that developing countries are only to benefit from strengthening their IPR protection, as they can gain bigger advantage in attracting FDI inflows and technology transference in this process, which will thus upgrade domestic and international welfare level (Nordhaus, 1969; Taylor, 1993). A survey of decision makers in American corporations by Mansfield (1994) showed if

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developing countries strengthening IPR protection, more FDI and technology transference would be attracted. In addition, a number of other studies (Petit and Sanna-Randaccio, 2000) suggested that a system allowing stronger technology spillover would be an obstacle to FDI inflow and thus would hurt the developing country's long term dynamic welfare.

However, there are some studies that begun to notice the negative effects of strengthening IPR protection. Lanjouw (1997) believed that by strengthening IPR protection, developing countries would hurt their own welfare as a great deal of economic rent would be transferred to FDI source countries possessing the IPR. Based on Krugman (1979) product variety framework in which technological change is view as product development, Helpman (1993) developed a dynamic general equilibrium model to evaluate the welfare effects of IPR policy, the study showed that the strengthening of IPR protection in the South lowered the rate of innovation in the North and hence brings about welfare losses to the South. However, it may also happen that the North loses just as the South does, when the rate of imitation is high and the fraction of multinational corporations is small. Similarly, Glass and Saggi (2002) also found that strengthening IPR protection would make imitation more difficult and hence increase the cost. Thus, with more resources devoted to imitation, FDI would be more easily squeezed out, causing resource shortages in the FDI source countries and eventually hurting innovation. Markusen's empirical analysis (1995) also indicated that to a country initially with low level IPR protection, strengthening its IPR protection may even lead to a decline in FDI inflow.

Recently, more and more studies have come to discover that a proper IPR protection level is more favorable in attracting FDI and increasing host countries' social welfare (Kwan and Lai, 2003). Chen and Puttitanun (2005) found that the optimal IPR protection level for a developing country depended on its own development level. In addition, they substantiated a U-shape relation between the IPR protection level and the economic development level with the panel data of 64 developing countries from 1975 to 2000. Grinolsa and Lin (2006) set up a South–North interaction dynamic model of multiple sectors and they worked out the different optimal IPR protection level for the South and North countries respectively through parameter simulation. With a dynamic game model, Yang and Han (2006) confirmed that by providing proper and efficient IPR protect regulation, the host country's government could not only attract more FDI inflow, but also maximize its social welfare as well. By analyzing empirical data of Hollywood's movie publications, McCalmans (2005) proved that a proper IPR protection level could stimulate overseas promotion of new technologies and products. Nevertheless the effect would be reversed once the IPR protection is too weak or too strong.

However, there have been few discussions on this issue with both tariff and IPR policies taken into account. Zigic (2000) establishes a game model in which the Southern government chose the range of IPR protection while the Northern government chose the tariff level. He demonstrated that the threat coming from the North's prohibitive tariff would force the South to strengthen IPR protection. In another model concerning a MNE with new products conducting trade and FDI in developing countries, Vishwasrao et al. (2007) observed how the government of developing countries chose the optimal tariff level and patent length in order to attract FDI and maximize social welfare in the developing country. Through a panel data analysis of 110 countries from 1960 to 1990, Ginarte and Park (1997) found that the trade liberalization was a strong determinant of patent protection levels across developing countries. Their study provided empirical evidence for theories on the interaction between trade and IRP policies.

Inspired by Norback and Persson's model (2004) in which foreign investors bid for state-owned enterprises against the host country's enterprises, a new model is put forward in this paper with a new variable of IPR policies added in addition to the existing tariff variable in their model. Our model is to provide a new perspective on the discussion of the relations between tariff and IPR policies as well as their economic effects. Compared with the model of Vishwasrao et al. (2007), our model focuses on the strength of a host country's IPR protection rather than the protection period, which may be more relevant to the reality of the developing country. In addition, our model takes into account of the oligopoly market, a situation more universal than the perfect monopoly market adopted in the paper of Vishwasrao et al. (2007). Our model is introduced in Section 2. Section 3 analyzes the equilibrium of the game. Section 4 concludes the paper.

## 2. The model

There are two countries, the foreign country  $F$  and the host country  $D$ . At the outset, a state-owned enterprise,  $s$  and a privately owned corporation,  $d$  are located in country  $D$ , while a MNE,  $f$  is resident in country  $F$ . Products are homogenous, but the production technology and the marginal costs of the three firms are different. The MNE has the least marginal cost, which is assumed to be 0 to facilitate the calculation without losing the universality; while the marginal cost of the domestic corporation is assumed to be  $c$ . In addition, the MNE has to pay the tariff  $t$  for each unit of the output exported to the market of the host country.

Now, the government of the host country will deregulate the market by selling the state-owned enterprise. If the MNE gets the state asset, it can avoid the tariff by producing products directly in the host country, however under that circumstances, spillover will also happen at the same time, which will cut the marginal cost of the domestic corporation. On the other hand, if firm  $d$  purchase the state asset, the MNE will stay in the foreign country and export the product to the host country. Finally, if neither of the two firms buys it, then according to the original intention of the government, the state-owned enterprise should be viewed as bankrupt rather than continue to be run by the government continually<sup>1</sup>.

The interaction of the model takes place in four stages. In the first stage, the government decides the level of tariffs. In the second stage, the government sells the state-owned enterprise through an auction. In the third stage, the MNE chooses the mode of

<sup>1</sup> The situation is actually prevailing in a transition economy such as China. During the transit period from a planning economy to a market economy the government is urgent to privatize some state-owned enterprises bearing huge losses because of facing the severe competition from private firms in the same markets (Zhang, 2006).

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