



Intellectual property rights, southern innovation and foreign direct investment



Anuj Joshua Mathew^a, Arijit Mukherjee^{b,c,d,e,*}

^a Ministry of Justice, 102 Petty France, London SW1H 9AJ, United Kingdom

^b School of Business and Economics, Sir Richard Morris Building, Loughborough University, Loughborough, Leicestershire LE11 3TU, United Kingdom

^c CESifo, Germany

^d RCIE, City University of Hong Kong, Hong Kong

^e CFGE, Loughborough University, United Kingdom

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ABSTRACT

The strength of intellectual property rights (IPR) in host countries is often considered to be an important determinant of inward foreign direct investment (FDI). Considering FDI to a developing or a newly industrialized country, we show that the host-country firm's innovative activity, which is empirically relevant yet has been ignored mostly in the literature, plays an important role in the relation between IPR and FDI. If imitation occurs under both export and FDI by the developed-country firm, stronger IPR in the host country may reduce inward FDI.

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1. Introduction

Intellectual property right is often considered to be an important determinant of foreign direct investment (FDI). Since developed-country firms make use of their intellectual-property related assets under FDI, it is generally believed that stronger intellectual property rights in developing countries encourage FDI to those countries by protecting the intellectual-property related assets of the foreign investors.¹ However, empirical evidence on the relation between intellectual property rights in developing countries and FDI to those countries is mixed.² We provide a reason for the negative relation between a stronger patent protection in the developing country and FDI to that country.

We show that a stronger developing-country patent protection may create an ambiguous effect on inward FDI in the presence of innovation by developing-country firms. While imitation (or knowledge spillover) is prominent in developing countries, recent

* Corresponding author at: School of Business and Economics, Sir Richard Morris Building, Loughborough University, Loughborough, Leicestershire, LE11 3TU, UK. Fax: +44 1509 222723.

E-mail address: A.Mukherjee@lboro.ac.uk (A. Mukherjee).

¹ Since the inception of the Uruguay round of the General Agreement on Tariffs and Trade, developing countries are increasingly urged to strengthen their patent regimes in order to standardize the patent regime across the world, thus trying to protect the intellectual properties of the developed-country firms.

² See Lee and Mansfield (1996), Maskus (1998), Yang and Maskus (2001), Mayer and Pfister (2001), Pfister and Deffains (2005), Seyoum (1996) and Fosfuri (2004).

empirical evidences also show considerable innovative activities in many developing and newly industrialized countries, yet this aspect did not receive much attention in the literature.³

We consider an international duopoly where a Northern (developed country) firm can sell its product to the South (the developing country) either through export or through FDI, and the Southern firm decides whether or not to innovate a new product. If the patent protection is weak, imitation allows a firm to produce the product of the other firm. We show that in the presence of imitation under both export and FDI, a stronger Southern patent regime may reduce the Northern firm's incentive for FDI if either the cost of Southern innovation is low, such that the Southern firm innovates irrespective of the Southern patent regime and the plant location decision of the Northern firm, or the Southern firm's cost of innovation is moderate, such that it innovates only under a stronger Southern patent regime. Otherwise, a stronger Southern patent regime increases the Northern firm's incentive for FDI.⁴

Our results refute a blanket approach for strengthening Southern patent protection in order to attract FDI. If the Southern firm's cost of innovation is not large and imitation occurs under both export and FDI, a stronger Southern patent protection reduces inward FDI. Hence, Southern patent policies may need to be complemented by other policies making FDI by the Northern firms to the Southern countries attractive.

If the Southern firm innovates irrespective of the Southern patent regime and the plant location decision of the Northern firm, the reduced product range of the Northern firm under a stronger Southern patent regime compared to a weaker Southern patent regime is the reason for the negative relation between the strength of the Southern patent protection and FDI to the South. However, if the Southern firm innovates only under a stronger Southern patent regime, the number of products produced by the Northern firm is unaffected by the Southern patent regime, but a stronger Southern patent regime increases the Northern firm's profit under both FDI and export by reducing the intensity of product-market competition. If the products are not very much differentiated and the output distortion under export, due to the transportation cost, is not large, a stronger Southern patent regime reduces the Northern firm's incentive for FDI by increasing the Northern firm's profit more under export than under FDI.

Glass and Saggi (2002) show the FDI reducing effect of a stronger Southern patent regime in a model where a stronger Southern patent regime absorbs more Southern resources for imitation, thus crowding out inward FDI. In contrast, imitation is costless in our analysis, as in Helpman (1993) and Lai (1998). Thus, we abstract our analysis from the resource effect of Glass and Saggi (2002), and innovation by the Southern firm is the key factor for our results.

The remainder of the paper is organized as follows. Section 2 describes the basic model. Section 3 finds out the Southern firm's incentive for innovation. Section 4 describes the relation between Southern patent protection and the Northern firm's incentive for FDI. Section 5 concludes. The proofs are relegated to the appendix.

2. The basic model

Consider two countries, called North and South. Assume that there is a firm in the North, called firm N , and a firm in the South, called firm S . We assume for simplicity that, at the beginning of the game, neither firm has any technology to produce a good. However, the firms can invent new technologies.

Let firm N wants to invent product x , while firm S wants to invent product y . We consider that the products x and y are imperfect substitutes.⁵ We assume that each firm can invent one product, which implies a restriction on the R&D capacity of the firms.⁶ Since x and y are imperfect substitutes, it is intuitive that the firms would prefer to invent different technologies.⁷

Assume that firm N is more capable in innovating and requires lower R&D investment. We assume that the R&D investment of firm N is $R_N \geq 0$ and firm S needs to spend R amount more than firm N . Hence, the cost of R&D to firm S is $R_S = R_N + R$. This is consistent with the previous works where the firms in the developed countries innovate at lower costs than their counterparts in the developing countries, thus making the former firms more prone to innovation (see, e.g., Chen & Puttitanun, 2005; Muniagurria & Singh, 1997).⁸ To economize on the notation, we normalize firm N 's cost of R&D to 0. This simplification will not affect our analysis as long as firm N innovates in equilibrium. Hence, this model of innovation is similar to Mukherjee and Sinha (2013).

³ Correa (1990), Tsai and Wang (2004) and Wei, Liu, and Wang (2008) respectively show evidences of innovative activities in Latin America, Taiwan and China respectively. In different contexts, innovations in less developed countries are also acknowledged in Muniagurria and Singh (1997) and Chen and Puttitanun (2005).

⁴ We also find the standard result that, if knowledge spillover occurs only under FDI, a stronger Southern patent protection increases the incentive for inward FDI.

⁵ The assumption of imperfect substitutes can be consistent with a strong patent if we consider that the degree of substitutability depends on the tastes and preferences of the consumers. For example, even if the manual typewriter is different from the electronic typewriter or computer, these products can be imperfect substitutes depending on the tastes and preferences of the consumers. Evidences can also be found from the pharmaceutical industry where two different drugs can solve some common problems. For example, both Zantac and Gaviscon solve the problem of acidity, and become substitutes.

⁶ Invention of some but not all products may be for strategic reasons or for physical or financial constraints on R&D. We assume the latter and consider that each firm can invent one product.

⁷ There may be a coordination problem in the R&D stage, i.e., which firm will invent which technology. However, the flow of information at the R&D stage and slight early investment of one firm may solve this coordination problem. We assume away this coordination problem by considering a pre-determined choice of technology development, since the coordination problem does not add anything to the main purpose of this paper.

⁸ As documented in Chen and Puttitanun (2005), "during 1985–1995, the number of [patent] applications was 2757 in Brazil, 1545 in India, 5549 in South Africa, and 59249 in South Korea; as compared to 9325 in Australia, 3039 in Canada, 335061 in Japan, and 127476 in the US during the same period."

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