

# Trade-related influences, foreign intellectual property rights and outbound international patenting

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## Abstract

This paper provides an empirical investigation of the national determinants of outbound international patenting, particularly focusing on the roles of trade-related influences and the destination countries' strength of intellectual property protection. Based on cross-patenting from 30 member countries in the World Intellectual Property Organization (WIPO) between 1995 and 1998, empirical results suggest that the behavior of outbound international patenting is strongly and positively associated with trade-related influences, like exports and outward foreign direct investments. Moreover, controlling for other variables, a country with stronger protection of intellectual property rights (IPR) tends to force more foreign inventors to file for patent applications, lending a supportive view of cross-country evidence for the strong-IPR hypothesis.

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## 1. Introduction

The activity of cross-country patenting has emerged and become prevalent and important during the past two decades. As the World Intellectual Property Organization's (WIPO) statistics demonstrate,<sup>1</sup> member countries have issued, on average, more patents to foreign inventors than residents since 1989 and the pattern of these

changes is also well documented by Eto and Lee (1993) and Kortum and Lerner (1998). Indeed, cross-country patenting is usually regarded as the main source of international diffusion of new products and processes and it is often regarded as a major driving force for a country's productivity growth (Eaton and Kortum, 1996) and/or economic growth (Jones, 2002). Why do firms apply for patents abroad? The patent–R&D relationship has been widely discussed in previous empirical works that set up an innovation production function with endogenous R&D flows and other exogenous variables,<sup>2</sup> yet few studies have considered patenting behaviors in an international context, suggesting the need for more empirical

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<sup>1</sup> The World Intellectual Property Organization (WIPO) is the organization within the United Nations that deals with international intellectual property issues. Its main objectives are promoting the protection of intellectual property worldwide and ensuring administrative cooperation among the intellectual property unions.

<sup>2</sup> For example, Hausman et al. (1984), Crepon and Duguet (1997), and Hall and Ziedonis (2001).

evidence on the determinants of outbound international patenting.

The patent right is widely regarded as an instrument for temporally enforcing the appropriate return to R&D investment. However, patent law is a territorialism, meaning that the protection mechanism is effective only when a firm files a patent in that country. The cost of outbound international patenting is perhaps higher than that in the home country,<sup>3</sup> while many firms act aggressively for outbound international patenting to protect their products in foreign markets and/or to construct patent portfolios that enhance their international competitiveness. This inspires the central issue explored in this study, which is that outbound international patenting should be intrinsically related to trade-related influences because the aim of firm patenting in a foreign country is to seek legal protection against potential imitators that would either export or produce goods through the establishment of foreign affiliates.

Intellectual property rights (hereafter IPR) have alternatively stimulated significant attention in the international economic policy arena over the past decades. IPR laws and the enforcement of existing laws differ widely across countries due to national differences in economic development and trade policy. The issue of how to strengthen and harmonize these means for protecting IPR across countries has stimulated significant attention in the arena of international economic policy, while the divergence for the effects of strengthening IPR between the North and South countries has increased in recent years. The enforcement of IPR and the threat of enforcement are of primary importance to those engaged in innovative activities. *Merges (1992)* argues that the upsurge of U.S. patenting activity that began in the mid-1980s is mainly driven by changes in the legal environment for patent holders. This argument is well known by economists as the “pro-patent policy hypothesis”, while empirical attention attempting to discern whether stronger patents induce more patents is limited and remains ambiguous and uncertain. More importantly, fewer studies have investigated whether foreign intellectual property rights (hereafter FIPR) aid or abet the flow of ideas across national borders, even though the role played by FIPR on exports, foreign direct investment, and technology transfer is well documented (e.g., *Ferrantino, 1993; Taylor, 1993; Maskus and Penubarti, 1995; Smith, 1999, 2001*).

This article aims to provide empirical evidence for national determinants of outbound international patenting and contributes the following three distinct types of empirical evidence that are in line with the literature: first, we develop a simple theoretical framework and use a new comprehensive information from a broader country dataset to investigate the national determinants of outbound international patenting. Second, this study proposes a “trade-related hypothesis” that specifies the role played by trade-related influences, including exports and outward foreign direct investment (hereafter OFDI) on a country’s outbound international patenting and tests whether this hypothesis is supported. Third, we assess whether the strength of FIPR attracts, *ceteris paribus*, more inbound foreign patents in that country, which has been termed, as the “stronger IPR hypothesis”, and tests whether this hypothesis can be supported in an international context.

By extending the country-level innovation production function and adopting cross-patenting data among 30 countries during the period of 1995–1998, this paper aims to assess the role played by trade-related influences and the strength of FIPR on a country’s outbound international patenting. The empirical results lend support to the hypotheses proposed in the study, namely, that the behaviors of outbound international patenting are influenced by trade-related factors and foreign intellectual property rights. Both exports and outward foreign direct investments have a significant and positive impact on overseas patenting. The strength of FIPR functions as an effective mechanism to increase foreign firms’ propensity for patenting in a particular country, and this argument is supported in different specifications, supporting the hypothesis that stronger IPR induce more patents.

The remainder of this paper is organized as follows: Section 2 briefly discusses cross-country patenting activity over the past decades. In Section 3, we review the related literature on cross-country patenting and the relationship between strengthening IPR and patenting. The theoretical and empirical frameworks are derived and the hypotheses are proposed in Section 4. In Section 5 we analyze the econometric results. Concluding remarks and policy implications are discussed in the final section.

## 2. Cross-country patenting activity in the world

Before turning into the empirical framework and econometric analysis, we will review the cross-country patenting activity of selected countries, which include most industrialized countries and some developing countries.

<sup>3</sup> Ignoring the renewal scheme, the cost of translating patent documents is also high. Thus, the cost of applying for patents may depend on the source country as well as the destination country.

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