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# The impact of the institution of patent protection and enforcement on entry mode strategy: A panel data investigation of U.S. firms

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ABSTRACT

The Trade-Related Aspects of Intellectual Property Rights (TRIPS) agreement has engendered a harmonisation of patent laws across countries but the extent of enforcement of these laws continues to vary. This study investigates the degree to which *de jure* book law protection of patents and *de facto* enforcement of these laws influences the propensity of firms to exploit their patented technology in foreign markets with company-owned operations or unrelated concerns using licensing agreements. Analyzing data on royalty and fee receipts of U.S. parent companies from affiliates and non-affiliated parties abroad from 1998 to 2007, and using separate measures for *de jure* and *de facto* patent protection and enforcement, we find that strengthening *de jure* protection induces greater affiliate licensing while strengthening *de facto* enforcement induces non-affiliate licensing. We conclude by observing that greater account should be taken of *de facto* enforcement measures when investigating the role of institutions on the international activities of firms.



## 1. Introduction

This study investigates the relationship between the propensity of firms to internalise transactions across national borders, the levels of *de jure* legal protection provided to patented product and process technology by countries, and the quality of *de facto* enforcement of these laws. It is situated at the juncture of two important trends concerning the ease with which proprietary technology is imitated and infringed. On the one hand, over the past few decades many countries have sought to strengthen the exclusive legal rights of patent-holders to prevent others from making, using, selling, or distributing patented technology without permission. The overarching objective of this is to foster an institutional environment that promotes innovation (Watal, 2000), technology transfers (Janodia, Sreedhar, Ligade, Prise, & Udupa, 2008; Park & Lippoldt, 2004), foreign direct investment (Oxley, 1999; Watkins & Taylor, 2010), international trade (Ivus, 2010; Maskus & Penubarti, 1995) and, it follows, economic growth (Falvey, Foster, & Greenaway, 2006; Gould & Gruben, 1996). Much of this reform is a consequence of countries complying with the requirements of the Trade-Related Aspects of Intellectual Property Rights (TRIPS) agreement, particularly among developing countries.[3] On the other hand, despite

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[3] The TRIPS agreement (instigated in January 1995 under the auspices of the World Trade Organization) is the most comprehensive multilateral agreement to date concerning intellectual property rights (IPR).

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improvements to the degree of legal protection now generally available in countries, the extent of patent infringements continues to rise (USTR, 2011).

According to OECD estimates, the international trade of counterfeit and pirated goods have accounted for around 2% of total world trade since 2001 (on a consistently upwards trend) and by 2007 this trade was valued at around US$250bn (OECD, 2009). In the same OECD study, it is stated that companies across all industrial sectors report counterfeiting and piracy to be prevalent not only in countries that have poor legal frameworks for the protection of intellectual property rights (IPR), but also among those that have implemented the most stringent IPR-related legislation. High rates of IPR infringement can be attributed to weak enforcement mechanisms, among other things.

This issue is illustrated by the recent conclusion of the "Anti-Counterfeiting Trade Agreement" (ACTA), a new international treaty which was finalised in November 2010 and has been ratified, to date, by the European Union (EU) and ten other countries in both the developed and developing world (Directorate General for Trade of the European Commission, 2011).[4] This treaty comes as a response to problematic enforcement efforts around the world and it defines new international standards for upholding IPR. It sets out provisions in relation to enforcement practices, institutional arrangements, international collaboration, and the development of a legal framework to facilitate the coordination and effectiveness of both enforcement agencies and the judicial systems of countries. According to the United States Trade Representative (USTR, 2011, p. 6), ACTA reflects "a commitment by the negotiating parties not only to have strong laws on the books, but also to pursue the international cooperation and meaningful enforcement practices necessary to make intellectual property protection effective".

We can therefore see a divergence between the level of legal protection of IPR offered by countries (i.e. book law or *de jure* law) and the ability, willingness and effectiveness of countries and their institutions to (*de facto*) enforce these laws. Put another way, the simple existence of a law or statute aimed at protecting the rights of a patent holder does not necessarily guarantee that those rights will be adequately upheld by the institutional system of countries that administer and enforce the laws. It is this divergence that forms the focus of the present study. In this paper we argue that research which evaluates the ability of an institution to uphold the rights of patent owners and the effects of this on firm behaviour need to take account of *both* the availability and nature of book law *and* how effectively these laws are enforced by countries.

The context in which we investigate this divergency concerns the entry mode choice of multinational enterprises (MNEs) and, in particular, the decision to license technology to affiliated or non-affiliated firms in foreign countries. A number of studies have investigated the relationship between the institutional system of patent protection and enforcement offered by countries and the entry mode choice of firms. The majority of these studies consider the pre-TRIPS period, i.e. from the 1980s to the early 1990s. These studies have explored the impact of IPR protection on foreign direct investment (FDI) levels and the choice between FDI and licensing to unrelated foreign companies (e.g. Ferrantino, 1993; Nunnenkamp & Spatz, 2002; Park & Lippoldt, 2004; Smith, 2001; Yang & Maskus, 2001). Taken together, the findings of this work are mixed. Some studies report a propensity for firms to favour licensing with unrelated companies (i.e. non-affiliate licensing) in those countries where patent protection is strong and, conversely, for FDI to be preferred in countries where it is weak (Hagedoorn, Cloodt, & Van Kranenburg, 2005; Park & Lippoldt, 2004; Smith, 2001; Yang & Maskus, 2001). Other studies report contrary findings, with FDI preferred to non-affiliate licensing as the degree of patent protection in countries strengthens (Puttitanun, 2003). Another study found no relationship between patent protection strength and the decision to license (Fosfuri, 2004).

One reason for these mixed results can be attributed to the measure of national patent protection strength used in empirical models (Arora, 2009; Cockburn, 2009). Prior studies have predominantly employed the index developed by Ginarte and Park (1997) to approximate national patent protection strength. This index was devised to estimate the level of book law patent protection offered in countries. However, it does not include measures that relate to the *de facto* enforcement of these laws (Arora, 2009; Cockburn, 2009; Park, 2008). This omission is not a limitation of the Ginarte and Park index per se. However, the fact that it does not account for enforcement levels in a country means it can be argued that studies which are solely reliant on this index and that do not account for enforcement issues in some other way provide only an incomplete picture of the institutional environment within which patent rights are upheld (Arora, 2009; Cockburn, 2009; Jain, 2002; Maskus, 2000).

It is evident that international treaties such as TRIPS have helped to harmonise book law protection across countries. Indeed, a look at the scores contained in the latest update of the Ginarte and Park index by Park (2008) reveals that *de jure* protection for a large majority of countries has improved significantly in recent times, with many countries offering very high, and almost equivalent, levels of book law patent protection. Nonetheless, in practice significant differences in the extent of enforcement of *de jure* legislation still remain (USTR, 2011). It is important, therefore, that studies which investigate the relationship between the overall level of patent protection offered by countries and the behaviour of firms in the post-TRIPS era of book law harmonization take due account of both the extent and nature of *de jure* patent protection and the *de facto* enforcement of these laws. This is because firms may respond differently to the quality of book law protection available to them and the quality of enforcement of those laws in practice.

In order to explore this issue we use an index developed by Papageorgiadis (2010) in this study that includes measures for both the *de jure* and *de facto* aspects of the institutional system of patent protection and enforcement. This index is employed alongside the Ginarte and Park (1997) index of book law protection in order to find answers to three research questions. First,

[4] Namely Australia, Canada, Japan, Korea, Mexico, Morocco, New Zealand, Singapore, Switzerland and the United States.