Title: Intellectual Property Rights on Entry Modes: A Meta-Analytic Review

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Abstract

This paper consolidates the state of academic research on the effect of IPR systems on MNEs' entry mode decisions. We conducted a meta-analytic review of 59 empirical papers published from 1988-2016 and identify four reasons for the mixed results in the existing literature. Our analysis demonstrates that the inconsistencies in the IPR systems and entry modes research is due to the following factors which have not been accounted for in the conceptualization and empirical validation of the relationship: (1) the adoption of TRIPs agreement, (2) host country economic development, (3) measurement of IPR , and (4) multiple theoretical lenses applied to examine the topic. We recommend the adoption of a contextualization approach, strongly advocating for the re-examination of the effects of IPR systems on entry modes in a narrower context where clear boundaries are set to make results are more representative.

Keywords: meta-analysis, intellectual property rights, entry modes, contextualization

INTRODUCTION

The rapid increase in global trade and investment activity especially in knowledge-intensive and high-technology products and services (Fink and Braga, 1999) have brought Intellectual Property Rights (IPRs) to the forefront of scholarly and managerial attention (Park 2012; Peng et al., 2017b). Intellectual property is often regarded as a major source of ownership advantage, allowing firms to overcome 'liability of foreignness' and achieve dominance within a host market (Dunning, 1993; Javorcik, 2004). To this end, strong IPR systems are associated with strong location advantage (Dunning, 1993; Khoury et al., 2014), ensuring multinationals (MNEs) that their IP rights (ownership advantage) will not only be granted, but also enforced, in case of violation within the host market.

With the increasing attention of the International Business research on foreign market entry choices (Canabal and White, 2008), the impact of IPR systems has naturally achieved special notice (Fosfuri, 2004; Khoury and Peng, 2011; Markusen, 2001; McCalman, 2004; Smith, 2001; Seyoum, 1996; Ushijima, 2013). Considering that MNEs tend to select entry modes that decrease their overall transaction costs while minimizing the illegal diffusion and exploitation of their IP assets (Andersen, 1997; Brouthers, 2002; Geyskens et al., 2006), it could be argued that the strength of the host country's IPR system should significantly influence MNEs entry mode decisions (Brouthers and Hennart, 2007). Interestingly, despite the rich related literature, research findings remain rather fragmented. Several theoretical inconsistencies (Candelin-Palmqvist et al., 2012) coupled with methodological variations, especially in the measurement of IPRs, have provided mixed and often competing results, restricting our overall understanding of the role of IPR systems on MNEs entry modes decision.

The current study offers a meta-analytic review that aims to clarify the tension within the extant empirical literature offering distinct contributions. By synthesizing the conceptual underpinnings and diverse empirical findings, the study offers an integrated understanding of the effects associated with the IPR systems and MNEs entry modes decision, specifically under different contexts. Despite the rich extant literature, the IPR systems – entry mode literature is highly fragmented whereas previous

attempts to consolidate the results are not only outdated, but are also confined to narrative approaches (Maskus, 2000; Buckley et al., 2013). By employing a meta-analytic review, we put forward a quantitative and an up-to date assessment of the relationship under investigation, while accounting for the key recent developments, such as the establishment of Trade Related Intellectual Property Rights (TRIPs) agreement. Our meta-analysis also responds to Buckley et al., (2013) call for more meta-analytic reviews in the entry modes literature as they can go one step further by statistically integrating knowledge and methodically examining findings of primary studies. To the best of our knowledge this paper is the first to offer a meta-analytic review on the IPR systems-entry modes literature. Furthermore, the meta-analytic review allows us to explain the mixed results, accounting for contextual idiosyncrasies such as host country economic development, the adoption of TRIPs agreement, as well as key theoretical tensions and methodological discrepancies in the measurement of IPR.

Finally, we put forward suggestions for future research on how to control for the effect of our findings when investigating the IPR systems-entry modes relationship by following contextualized theorizing and testing (Plakoyannaki et al., 2019; Tsui, 2006; Welch et al., 2011). Although the dominant belief in the IB field, and generally in social sciences, is that context-free generalisable knowledge is superior to context-specific localized knowledge (Tsui 2004; Welch et al., 2011) we posit that IB is the most appropriate field to explore contextualization given its cross-border nature and different populations involved (Welch et al., 2011). By acknowledging that countries are not homogenous we push forward by suggesting that multiple factors add to the distinctiveness of countries such as their institutional environments (i.e IPR systems), their level of economic development, their participation in international agreements (TRIPs), and such contextualized factors need to be accounted for when the IPR systems-entry modes relationship is investigated.

The remaining of the paper is structured as follows. We begin by providing a comprehensive literature review of the key factors affecting the IPR systems-entry modes relationship. We move on to the empirical investigation f the phenomenon via a meta-analysis. Our findings and interpretation follow next. Finally we offer conclusive remarks and suggestions for future research.

COMPREHENSIVE LITERATURE REVIEW

IPR systems

Intellectual Property (IP) refers to the creations of the mind (such as ideas, artistic works, names, designs, software programs and inventions in general) that if exploited has a commercial value (World Intellectual Property Organization (WIPO), 2014; Maskus, 2000). Intellectual Property Rights (IPRs) laws are enacted and enforced to provide the creator of IP an opportunity to exclusively exploit the IP for commercial benefit for a specific period of time as a means of rewarding, compensating and encouraging creators to continuously develop new IPs (Maskus, 2004).

Acknowledging that 'any reference to or an examination of an IP system should be interpreted in respect of proper enforcement and consequently as an interpretation and examination of the content and adequacy of IP law protection' (Maskus, 2004, p.2), a country's IPR system is conceptualized as having two pillars: (1) IPR protection laws and (2) IPR enforcement (Khoury et al., 2014; Maskus, 2004; Ostergard, 2000; Peng et al., 2017a; Papageorgiadis et al., 2014). The IPR protection element refers to the legal statutes that enable the granting of a type of IPR (patent, copyright, and trademark) and determine the legal boundaries inside which IP owners can exercise these rights. IPR protection laws also outline the legal sanctions related to the misappropriation of IP rights (Gowers, 2006; Papageorgiadis et al., 2014). The IPR enforcement element relates to the enforcement of such laws by the relevant agencies (police, judiciary) in case of IP infringement (Keupp et al., 2010; Khoury et al., 2014; Peng et al., 2017a).

Strong IPR protection refers to the existence of statutes that exclude or prevent others from using the IP and outline sanctions proportionate to the harm caused in case of infringements (Gowers, 2006). Effective/strong IPR enforcement refers to independent, transparent and non-corrupt judiciary and enforcement authorities that put into effect the legal statutes and sanctions in cases of IPR infringement (Pajunen, 2008; Seyoum, 2006).

The IPR systems – entry modes relationship: Empirical evidence

'International entry modes represent the third most researched field in international management' (Canabal and White, 2008:267). MNEs when expanding into new foreign markets consider equity (FDI) and non-equity (licensing/franchising and exports) entry modes (Asiedu and Esfahani, 2001; Brouthers and Hennart, 2007). Prior research has identified a number of factors that influence entry mode decisions including the degree of control, their resource commitment, firm-specific and location advantages, risk exposure, and expected future returns (Ahsan and Musteen, 2011; Anderson and Gatignon, 1986; Agarwal and Ramaswami, 1992; Buckley and Casson, 1998). The role of host country institutional environment, particularly the impact of IPR systems on the MNE entry mode choice has been at the forefront of this with discussion but without a clear consensus on this relationship (Javorcik, 2004; Arora, 2009; Maskus, 2000; Peng et al., 2017) (see also Table 2).

From the review of the empirical literature is it evident that research findings are mixed with an antagonising effect between equity (FDI) and non-equity (licensing and exports) entry modes to exist. Considering that IPR systems affect MNEs transaction costs by increasing or decreasing the levels of external uncertainty (Andersen, 1997; Brouthers, 2002; Geyskens et al., 2006), it is generally argued that in uncertain environments such as weak IPR systems MNEs will internalise their activities via equity entry modes in their effort to avoid the misappropriation of their valuable IP. However as FDI is resource-demanding and time-consuming mode of entry, previous studies have also argued that MNEs are likely to select non-equity entry modes in uncertain environments (weak IPR systems) so that they can easier exit from the market if deemed necessary (Zhao et al., 2004; Brouthers and Hennart, 2007; Canabal and White, 2008). Same antagonising effects are identified in the context of stronger IPR systems where MNEs are found to select both equity and non-equity entry modes.

For instance, some studies investigating the investment activity in emerging and developed countries find that MNEs select FDI as entry mode in host countries with strong IPR systems (Nunnenkamp and Spatz, 2004; Du, Lu, Tao, 2008; Ushijima, 2013). Similarly, Samad (2010) conclude that strong IPR systems are likely to encourage MNEs to set up production via FDI and invest in South and South-

east Asian countries and Adam (2010) and Khan and Samad (2010) conclude that stronger IPR systems in developing countries have a positive impact on FDI flows to these countries. Nevertheless, other studies offer different expectations. In specific, Yang and Maskus (2001) find that MNEs select non-equity entry modes and particularly licensing in countries with strong IPR systems. Oxley (1999) shows that U.S firms tend to select non-equity alliances rather than equity joint ventures when partnering with firms based in countries with strong IPR systems. Nicholson (2007), examining different industries, reports that MNEs with IP dependent goods tend to choose FDI over non-equity entry modes, while MNEs operating in capital intensive industries, (such as automobile or machine parts manufacturing), are more likely to choose non-equity entry modes over FDI. Similarly, Puttitanum (2002) suggests that the strengthening of IPR systems in host countries encourages non-equity entry modes in high R&D industries and FDI in high R&D industries.

Interestingly, despite the above inconsistencies, a better consensus seems to exist on the entry mode selection under weak IPR systems. There is a consensus in prior literature that weak IPR systems do not provide clear regulatory frameworks nor effective and efficient enforcement (if violation occurs). This translates in to higher risk of local partner violating the contract and acting opportunistically to imitate MNEs IP and act in direct competition (Co et al., 2004; Javorcik, 2004). Hence, weak IPR systems deter non-equity entry modes and encourage MNEs to internalise their activities via FDI.

From the above discussion it is evident that there is a lack of consensus in the extant literature. The literature is yet to put forward concrete expectations on when equity (FDI) and non-equity (licensing and exports) entry modes are preferred under different IPR systems, particularly in strong IPR systems. To understand the lack of consensus in the findings, we investigated the literature systematically and analytically to come up with the likely causes. We did so by following Tranfield et al.'s (2003) best practice guidelines on how to conduct a thorough literature review and we collected published and unpublished studies that directly examined the effect of IPR systems on FDI, licensing and exports in order to gain an overall appreciation of the tensions observed in the literature. After summarizing and organizing the key characteristics of each study and identifying the similarities and differences among the existing studies in terms of theories, methodologies, and research designs

employed in the existing studies (Tranfield et al., 2003), we were able to identify four possible reasons responsible for the mixed results in the IPR systems-entry modes literature namely; (1) multiple theoretical lenses applied to examine the topic (2) the adoption of TRIPs agreement, (3) host country economic development, (4) measurement of IPR systems.

Theoretical lenses. One of the first observations drawn from our literature review was the use of multiple theoretical perspectives in the IPR systems-entry modes literature. Building upon the core theory in the IB field – Transaction costs theory (TCT) - one of the key theoretical premises posits that weak IPR systems increase MNEs' transaction costs by increasing the levels of external uncertainty. Uncertainty increases with the unpredictability of external events, leading to information asymmetry that further increases MNEs transaction costs (Zhao et al. 2004; Brouthers and Hennart, 2007; Geyskens et al. 2006). In the context of IPR systems-entry modes, countries' IPR system is the source of external uncertainty. Countries with strong IPR systems ensure existence of IP laws and also effective enforcement in case of violation by restricting (and penalising) the opportunistic behaviour of contracting parties which provides stability and security for investment (Geyskens et al. 2006). Under low external uncertainty (i.e. strong IPR systems) MNEs can exploit their ownership advantage with entry modes which require lower resource commitment, and are less costly and time consuming such as licensing or exports (non-equity entry mode over equity). On the contrary, countries with relatively weak IPR systems increase the transaction costs due to high source of external uncertainty (Geyskens et al. 2006) and require MNEs to adopt high control entry modes, such as FDI.

However, other theoretical premises offer alternative explanations. For instance, the OLI framework posits that the possession of unique IPs is a source of MNEs ownership advantages which can be successfully exploited in countries with strong location advantages, such as a strong IPR systems (Javorcik, 2004; Khan and Samad, 2010; Khoury and Peng, 2011; Zhang and Yang, 2016). The OLI framework expects that internationalization will increase within countries with strong IPR systems. However, in order to exploit the ownership advantage in the host market with information asymmetry (North 1992; Williamson 1981), MNEs may decide to internalize their activities via equity entry modes (FDI) avoiding the non-equity entry modes.

Studies investigating the effect of IPR systems on trade versus FDI often employ the concepts of market power and market expansion (Maskus, 2000; Smith, 2001; Falvey et al., 2009). These studies are based on the theoretical premise which argues that stronger IPR protection and enforcement systems in a host country may restrict the opportunistic behaviour of domestic firms to imitate the imported goods, reducing the production of substitute products (Maksus, 2000; Maskus and Penubarti, 1995; Rafiquzzaman, 2002). This can act as a double edge sword in the domestic market competition. Stronger IPR systems increases the market power of IP holders (in this case MNEs) inducing monopolistic behaviours which restricts the competition in the domestic market (Maskus and Penubarti, 1995; Rafiquzzaman, 2002; Yew et al. 2011; Fink and Braga, 1999). On the other hand, the market expansion perspective suggests that stronger IPR systems offer high security against infringement which increases the demand for the external supply of the advanced technological goods required within the domestic market that can increase external trade (Raffiquzzaman, 2002; Maksus, 2000). According to this theoretical standpoint, strong IPR systems will protect MNEs exported goods and thus trade will be preferred. On the other hand, weak IPR systems may allow domestic partners to imitate MNEs exporting goods and thus FDI may be preferred (Markusen, 2001).

As discussed above, prior studies offer conflicting expectations on the IPR system-entry modes relationship depending on their theoretical stand point. Moreover a number of studies are exploratory in nature meaning that are not based on any specific theoretical premise. These studies provide an ex-post explanation of the empirical results (e.g. partial or dynamic general equilibrium econometric models and North-South product cycle) which provides mixed findings, some favoring the non-equity entry modes and others the equity ones (Glass and Saggi, 2002; Branstetter and Saggi, 2011).

Study time-period – Pre and Post TRIPs agreement. Majority of the empirical studies which investigate the IPR systems-entry modes relationship use of longitudinal datasets, often covering several decades of data. For example, Ivus (2010) used data from 1962 till 2000, Kashcheeva (2010) from 1970 to 2009, Ushijima (2013) from 1985 to 2004, and Hsu and Tiao (2015) from 1985 to 2010. Although the use of longitudinal datasets improves the generalisability of the research findings, it can

also weaken the accuracy of the results considering the global institutional changes to IPR regime in the last decades.

The rise of knowledge intensive investments has brought the national IPR systems into the forefront of managerial and policy attention (Javorcik, 2004; Peng et al. 2017a,b). Historically, there were significant variations in the level of IPR protection and IPR enforcement among nations (Papageorgiadis et al., 2014; Peng et al., 2017b). As a result, while IP owners may be awarded IPR protection and enforcement in one country, they may not be able to enforce their rights in another (Peng et al., 2017b) which created serious issues for firms that based their success in a form of IP. To reduce cross-national inconsistencies in 1995, the WTO introduced the TRIPs agreement, setting the minimum standards for IPR law protection procedures across WTO countries and providing common civil and criminal remedies for potential IPR infringement (Archibugi and Filippettti, 2010; Peng et al., 2017b; WTO, 2017).

Therefore, it can therefore be argued that the effect of IPR systems on entry modes will vary prior, during, and after the institutional change in the form of TRIPs agreement (i.e. pre TRIPs- during TRIPs implementation – post TRIPs). Prior to the TRIPs agreement, IPR systems differed substantially between nations both in terms of IPR protection laws and their enforceability. As such (global) external uncertainty levels were high. According to TCT when external uncertainty is high, MNEs often select high control entry modes such as FDI in order to control for and restrict negative externalities, such as IP leakages and IP misappropriation arising from the (unpunished) opportunistic behavior of competitors and/or contractual parties. During the implementation of the TRIPs agreement uncertainty levels started to reduce as majority of developed countries immediately complied with the TRIPs mandates, making changes to both formal institutions (put forward strong IP laws) and informal institutions (effective enforceability of IP laws when violation occurred). During that time, MNEs could use both FDI and non-equity entry modes (licensing or exports) to enter a host country mostly based on the strength of the IPR system in force. Finally, in the post TRIPs agreement era, where majority of countries have fully complied with the TRIPs mandates, and thus levels of external uncertainty are low, MNEs are expected to favor non-equity entry modes.

Naturally, studies using data prior or during the IPR institutional changes (TRIPs and other IPR agreements) have found mixed results most likely due to the strength of IPR systems varying greatly among countries (Puttitanum, 2002; Co et al., 2004; Fosfuri, 2004; Javorcik, 2004; Smith, 2001; Mansfield, 1994; Maskus and Penubarti, 1995; Khoury and Peng, 2011; Ushijima, 2013; Bransteller et al., 2006; Ivus, 2010). Interestingly though, studies examining the effect after the IPR institutional changes (where global IPR systems in their majority were strengthened) have also been unable to offer concrete results. While cross-national inconsistencies in IPR protection levels significantly decreased with the introduction of TRIPs (Peng et al., 2017b), significant differences remained in the enforcement levels (Archibugi and Filippettti, 2010; Peng et al., 2017b; Papageorgiadis and McDonald, 2019). This was particularly prevalent among the emerging economies which presented different levels and stages of implementation and enforcement of the TRIPS agreement altogether. In fact, to date, only two studies examine the effect of IPR systems on entry modes strictly after TRIPS (Branstetter et al., 2007; Watkins and Taylor, 2010) both unfortunately resolving into inconclusive results, with Branstetter et al. (2007) finding a positive association between strong IPR systems and FDI and Watkins and Taylor (2010) reporting an insignificant one.

From the discussion so far, it is evident that the IPR systems-entry mode relationship is influenced by the institutional changes brought by the TRIPs agreement. Taking this as granted we argue that the extant literature has two shortcomings. First, the phenomenon has been studied extensively prior and during the implementation of the TRIPs agreement (i.e. Puttitanum, 2002; Co et al., 2004; Fosfuri, 2004; Javorcik, 2004; Smith, 2001; Mansfield, 1994; Maskus and Penubarti, 1995; Khoury and Peng, 2011; Ushijima, 2013; Bransteller et al., 2006; Ivus, 2010), but comparatively less in the post-TRIPs agreement era (Branstetter et al., 2007; Watkins and Taylor, 2010). Since TRIPs agreement was a major institutional change, there is a need to uncover its effectiveness and impact to IB topics post its implementation. Second, majority of extant research examines the phenomenon without accounting for the time-period. The sample selection is from a variety of time periods (prior TRIPs, prior and during TRIPs, during and post TRIPs etc.) and this may have led to non-representative and mixed results.

Role of host country's level of economic development. Another caveat in the consolidation of past empirical research on the IPR-entry mode choice relationship resonates interestingly in sampling issues. Most extant studies have used a combination of developed and emerging economies in examining the underlying relationship (Co et al., 2004; Fink and Braga, 1999; McCalman, 2004; Seyoum, 1996),while some others have focused on emerging economies alone (Awokuse and Yin, 2010; Branstetter et al., 2007; Khoury and Peng, 2011). While TRIPs agreement has been signed by both developed and emerging economies, the rate of their adoption varied significantly distorting the outcomes of respective empirical studies.

It is well acknowledged within the theory of institutional change that while it is relatively straight forward to make changes in the formal institutions by adoption of strong IPR protection laws per say, ,informal institutions which are responsible for the enforcement of laws, are highly resistant to change (Helmke and Levitsky 2004; North 1992). In developed economies, with largely homogenous formal institutions and with informal institutions rather supportive towards law enforcement (Peng et al., 2017; Yi et al., 2015), institutional changes tend to be more easily enacted. On the contrary, in emerging economies, with formal institutions being often inefficient, complex, and weak, informal institutions tend to dominate the market which resist changes to the institutional framework (Peng et al., 2017a,b). Considering that for a new law to become customary, it needs to be aligned with the country's both formal institutions and informal institutions (Peng et al., 2017; North, 1991; Hodgson, 2006), even after the TRIPs agreement, variations in the adoption of IPR changes were naturally observed between developed and emerging economies. Indeed, while developed economies adopted the TRIPs mandates immediately, emerging and less developed economies lagged behind, exhibiting different levels of IPR protection and enforcement (many offering strong IPR protection but weak IPR enforcement) (Peng et al., 2017b).

The inconsistencies observed in the findings in the extant literature are due to the sampling variations. For instance, Du et al., (2008) and Adams (2010) found that MNEs tend to invest via FDI in emerging economies whereas Awokuse and Yin (2010) reported that in emerging economies with strong IPR protection laws, but varying levels of enforcement, non-equity entry modes are preferred. Studies

using a mixture of developed and emerging economies in their sample draw similar conclusions. For instance, while Ushijima (2013) identified a positive relationship between stronger IPR protection and equity entry modes, Fosfuri (2004) found a negative one. Park and Lippoldt (2008) identified a positive relationship between stronger IPR protection and enforcement and non-equity entry modes, while Al-Mawali (2005) didn't find any significance. Fink (2005) identified an insignificant relationship between IPR protection and non-equity entry modes, whereas Nicholson (2007) found a positive one.

When considering the composition of the sample, we observe once more a tension in the IPR systems-entry modes literature. The use of mixed samples of emerging and developed economies, in fact allows (but does not control for) the institutional differences among emerging and developed economies to obscure the IPR systems-entry modes relationship. Studies which include sample from more developed economies end up identifying positive results in favor of non-equity entry modes, whereas studies examining emerging economies find positive results in favor of equity entry modes.

IPR measurement. While it is well known that an IPR system incorporates the two pillars of IPR protection and IPR enforcement (Khoury et al., 2014; Maskus, 2004; Ostergard, 2000; Papageorgiadis et al., 2014; Peng et al., 2017a), the majority of existing studies have assumed that both pillars can be captured efficiently by one single IP index/measurement. As such, most studies have used the Ginarte and Park (1997) or the updated Park (2008) patent protection index (GP index) to measure IPR systems (Javorcik, 2004; Maskus, 2000; McCalman, 2004; Smith, 2001; Papageorgiadis et al., 2013). Yet, both indices are designed to provide only "an indicator of the strength of patent protection and not the quality of patent systems" (Park, 2008:761) and hence does not measure the enforcement element of an IPR system (Fosfuri 2004; Javorcick 2004; Nicholson, 2007; Nunnenkamp and Spatz, 2004; Papageorgiadis et al., 2014).

Only a handful of studies have attempted to capture specific IPR enforcement levels. Some have used survey data to capture the perceptions of business practitioners regarding the quality of IPR enforcement (Seyoum, 1996; Mansfield, 1994), while others have used the WEF index (Awokuse and

Gu, 2015; Nunnenkamp and Spatz, 2004; Park and Lippoldt, 2008; Watkins and Taylor, 2010; Weng et al., 2009; Yang and Huang, 2009), and/or developed their own enforcement indices (Javorcik, 2004; Papageorgiadis et al., 2013). For example, Javorcik's (2004) index measures the quality of IPR enforcement by quantifying reports and other secondary data on IP enforcement effectiveness. The Papageorgiadis et al. (2014)'s international patent systems strength index (IPSS) is an annual longitudinal composite measure that provides annual scores for 48 countries, ranging from 0 to 10 with 10 indicating the most effective IPR enforcement levels (Papageorgiadis et al., 2014).

The above discussion suggests that majority of previous studies only manage to capture the effect of IPR protection and not the IPR enforcement levels, unintentionally overestimating the former and underestimating the latter (Ostergard, 2000). However, the measurement of IPR system used in an empirical investigation of the IPR systems-entry modes relationship affects the end results. In particular, countries with strong IPR protection only minimise external uncertainty for MNEs steaming from the existence (or not) of IP laws without reducing however the transaction costs originating from potential misappropriation of their IP. MNEs may be lured to invest in countries with strong IPR systems (often making use of other location advantages) but most probably employ an equity-based entry mode. If entered otherwise, the weak/fluctuating or non-existent IPR enforcement will give rise to contracting costs (attempting to write up a contract accounting for every contingency), monitoring costs (monitoring the contracting party's behaviour to ensure that they don't violate the agreement) and enforcement costs (if violation occurs costly and everlasting court procedures). On the contrary in countries with strong IPR protection and strong IPR enforcement reduce the external uncertainty and MNEs are expected to enter using a non-equity entry mode. Strong IPR systems (thus low external uncertainty) reduces information asymmetry which enables firms to predict future contingencies which can be included in the contractual agreements reducing the opportunistic behaviour of the contracting party to act against the agreement.

The above discussion demonstrates the inconsistencies in the IPR systems-entry modes literature. Drawing from our previous analysis we suggest that the inconsistencies in the IPR systems-entry modes relationship is due to (1) the theoretical premises employed to conceptualise the relationship,

(2) the time-period the study was conducting i.e. prior-during-post the institutional change brought by TRIPs agreement, (3) the sample selection i.e. mixed country samples or not and (4) even on the IPR measurement itself. To resolve the inconsistencies in the existing literature we next employ a meta-analysis in order to statistically integrate the results of our thematic analysis (Tranfield et al., 2003; Kirca and Yaprak, 2010), and provide clear-cut explanations on the reasons for the mixed results in this research stream.

METHODOLOGY

This study employs a meta-analysis to quantitatively synthesise the current empirical literature on the effect of IPR systems on entry modes. Specifically, three meta-analyses are conducted to investigate the impact of IPR protection and enforcement on FDI, trade and licensing.

The conflicting findings in the IPR systems-Entry modes literature can be contingent on the four themes identified in the review section; (1) TRIPs agreement, (2) host country economic development, (3) IPR measurement, and (4) theoretical lenses and also to (5) the different estimation techniques employed by the primary studies, and (6) the different study characteristics. This study controls for all the aforementioned factors to become the first study to employ a meta-analytical approach for the investigation of the effect of IPR systems on entry modes.

<u>Data Collection</u>

To develop a transparent, reliable and replicable meta-analysis, we follow the best practice guidelines recommended by Roberts and Stanley (2006), Stanley and Doucouliagos (2012) and Kirca and Yaprak (2010).

--------Table 1 about here--------

To maintain consistency with previous review articles, we focused on English language studies published in peer-reviewed journals, and also unpublished studies including working papers from research repositories such as NBER, OECD, RAND, doctoral dissertations, departmental working papers and book chapters,. We conducted a keyword search using various electronic databases

(ProQuest, JSTOR, Science Direct, EconLit) and the web search engine of scholarly literature 'scholar.google.com' using multiple keywords (see Table 1). Moreover, we consulted the reference sections of all the articles retrieved in the first phase to identify any studies that we might have overlooked.

From the above process, we identified 172 studies for the time period 1988-2016 (publishing date). However, the use of specific keywords generated papers which are conceptual in nature and did not empirically examine the direct effect of IPR systems on entry modes. To eliminate such studies, we screened these studies employing a number of criteria. First, studies should empirically address the effect of IPR systems on FDI flows, trade/exports flow and licensing agreements, ruling out theoretical/review studies and studies examining the effect of IPR systems on issues such as ownership and establishment mode (M&A, WOS, equity invested etc), economic growth, innovation. Second, in the empirical studies, we only considered studies where the dependent variable is one of the entry mode decisions (e.g., FDI, trade or licensing) excluding studies where dependent variable is not entry mode for instance R&D intensity (Kumar, 1996) or imitation capacity (You, and Katayama, 2005). Third, we only included studies where IPR protection and/or IPR enforcement are measured with an isolated and not aggregated measurementas independent variable. For instance, studies that proxied IPR systems using measures of political stability, corruption perception index, political freedom, government effectiveness/efficiency etc. were excluded. Fourth, the empirical studies must include information on all the essential data (i.e. Effect sizes, Standard errors, Sample size) (Stanley and Doucouliagos, 2012). Fifth, we excluded studies in policy-oriented journals such as WIPO and WTO (with either only a small summary of the topic or that focused on policy issues and improvements) editorials and commentaries. After inclusion criteria, the number of studies reduced from 172 to 59 eligible studies which we used to perform the meta-analysis. A full summary of the characteristics of the final sample of studies reviewed is presented in Table 2.

--------Table 2 about here--------

Effect size. The t-statistic and r-statistic are the most widely used estimates of effect size in the International Business discipline (Geyskens et al., 2006; Gorg and Strobl, 2001; Meyer and Sinani, 2009; Zhao et al., 2004). For our analysis, we chose the t-statistic effect since it has the advantage of being comparable across studies and is most often provided by the studies, unlike the r-statistic requires computation(Meyer and Sinani, 2009; Stanley and Doucouliagos, 2012). For all the studies included in our sample, we collected the different coefficients of the IPR system variable along with their associated t-statistic values. Our analysis is based on the following model:

$$y_{ij}^* = \sum_{k=1}^{K} \beta_k \, Z_{k,ij} + \varepsilon_{ij}$$

Where Y_{ij} is the t-statistic of the IPR systems coefficient derived from the jth regression in the ith study, $\varepsilon_{ij}$is the error term that is assumed to benormally distributed, $Z_{k,ij}$ refers to a vector of K independent variables and β_k is the corresponding coefficient vector. The key explanatory variables include; IPR protection, IPR enforcement, TRIPs agreement, Host country level of economic development, theoretical lenses. Other control variables include; estimation and study characteristics and we also control for publication bias. Variables' definition and data sources can be found in Table 3.

--------Table 3 about here--------

RESULTS

At the moment we only have preliminary results for the FDI dataset which seem to provide clear and consistent support for the central themes of this study being that the; (1) IPR measurements, (2) theoretical lenses, (3) TRIPs agreement, (4) host country economic development, (5) estimation techniques, and (6) study characteristics moderate the IPR systems-entry modes relationship.

Looking at the results from the FDI dataset (Table 4), we observe that the coefficient of Ginarte and Park (1997) or the updated Park (2008) patent protection index is negative and statistically significant

(-2.031, p<0.05) suggesting that studies using the aforementioned IPR systems proxy, tend to find a negative relationship between stronger IPR protection and FDI flows. The coefficients of WEF index and the authors own enforcement indices are also negative and statistically significant (-3.345, p<0.001 and -2.533, p<0.01 respectively) suggesting that in countries with stronger IPR enforcement FDI is not the preferred entry mode. In fact, we find that studies sampling emerging economies alonetend to have more positive associations between the strength of IPR systems and FDI flows supporting the view that IPR systems in emerging economies are relatively less stable and thus equity entry modes are preferred. Overall, these results support the TCT theoretical standpoint of stronger IPR systems favouring non-equity modes over equity entry modes (Geyskens et al. 2006).

Conversely, studies with either no theoretical expectations or based on the traditional OLI framework, predict a positive and statistically significant relationship between stronger IPR systems and FDI flows (7.840 p<0.001 and 3.336, p<0.001 respectively). It seems that alternative theoretical approaches may also change the approach of analysis adopted, resulting as such in diverse empirical observations. Exploring the phenomenon by employing the OLI framework or any other theoretical model (deductive approach) researchers put forward well justified hypotheses/predictions about the relationship irrespectively of the end findings. On the other hand, the use of no theoretical support to conceptualise the phenomenon i.e. an inductive approach can be rather precarious. Since such approaches tend to be rather grounded on the data rather than the theoretical expectations hampering the validity or generalizability of the research findings (Saunders et al. 2003).

Furthermore, our results clearly suggest that studies conducted prior to the TRIPs agreement or during the implementation period tend to find a positive relationship between IPR systems and FDI. This is consistent with our expectations, as prior the TRIPs, uncertainty levels among host countries were very high, often resulting in greater transaction costs. Therefore, equity entry modes prevailed to cater for the increased uncertainty. Similarly, during the TRIPs implementation period uncertainty levels varied since several countries delayed their implementation status.

Regarding the FDI measurement, we observe that all coefficients are positive, but statistically insignificant, implying that the selection of the dependent variable in the primary studies does not influence the conclusions drawn on the effect of stronger IPR protection and enforcement on FDI flows. With respect to the study characteristics, we observe that the use of panel or cross-sectional data or the use of firm level vs. industry level data have no significant effect on the IPR-FDI relationship. The coefficient of the publication bias is positive, but statistically insignificant indicating the absence of publication bias in the IPR systems and FDI flows literature.

--------Table 4 about here--------

DISCUSSION

Using meta-analytic data we demonstrate that contextualised factors such as the TRIPs agreement, host country economic development, IPR measurement and theoretical lenses, explain the seemingly contradictory and inconclusive results in the IPR systems-entry modes literature. Previous research has indicated that failure to control for the contextual factors results in mixed findings in the IPR systems-entry modes literature (Maskus, 2000). We strongly encourage future research to account for the direct and moderating effect of the aforementioned factors on the IPR systems – entry modes relationship. In line to the above, and responding to the call for a contextualised approach in IB research (Welch et al. 2011; Tsui et al., 2007), we further offer specific suggestions on how the IPR systems-entry modes research can be contextualized by accounting for these four factors in the theorizing and testing of the phenomenon. This is important as 'the focal phenomenon cannot be understood, interpreted appropriately, and described in relevant fashion unless the researcher looks beyond the phenomenon itself to other configurations or surrounding factors that produce and shape the phenomenon' (Plakoyiannaki et al., 2019:5). A contextualisation approach is defined as a research's effort to incorporate a nation's social, cultural, legal and economic background in the theorizing and empirical investigation of a phenomenon (Tsui et al., 2007; Tsui, 2004; Chen, 1995).

We are planning to provide specific recommendation for future research on how to contextualize the four factors identified above. Indicative our suggestions will be along the lines:

- Contextualization in sample selection: New classification of countries based on the level of economic development and the stage of economic development

- Contextualization in Theory: Contextualize Western theories

- Contextualization in IPR measurement: Qualitative research design

- TRIPs agreement: Call for empirical evidence

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TABLES

Table 1. Meta-analysis protocol

Meta-analysis protocol suggested by Stanley and Doucouliagos, (2012) & Kirca and Yaprak (2010)		**Current study's steps**
Planning	Select the topic and the research stream inside which it will be investigated	IPR systems and entry modes, specifically FDI, trade and licensing. International business and economic perspective
	Read key empirical and conceptual articles on the topic	Yes
	Identify important, common variables, study and measurement characteristics	-The host country's level of economic development, -The TRIPs agreement, -The IPR enforcement measurement, -The theoretical lenses used to conceptualise the phenomenon -Study characteristics (Firm level data, No. of observations, Time span, Panel data) -Estimation characteristics (GMM OLS GLS SUR Year fixed Random fixed Probit model)
	Develop a review protocol to enhance replicability and transparency	Present table
Execution	Identify studies via the use of keywords, search themes, reference lists	foreign direct investment/FDI and intellectual property rights/IPR*', 'foreign direct investment/FDI and patent rights*', 'trade and intellectual property rights/IPR*', ''trade and patent rights*', 'exports and intellectual property rights/IPR*', 'exports and patent rights*', 'imports and intellectual property rights/IPR*', 'imports and patent rights*', 'licensing and intellectual property rights/IPR*', 'licensing and patent rights*', 'knowledge/technology transfer and intellectual property rights/IPR*', 'knowledge/technology transfer and patent rights*', 'entry modes and intellectual property rights/IPR*',

		'entry modes and patent rights*'
Inclusion criteria		Yes First, studies should empirically address the effect of IPR systems on FDI flows, trade/exports flow and licensing agreements, ruling out theoretical/review studies and studies examining the effect of IPR systems on issues such as ownership and establishment mode (M&A, WOS, equity invested etc), economic growth, innovation. Second, in the empirical studies, we only considered studies where the dependent variable is one of the entry mode decisions (e.g., FDI, trade or licensing) excluding studies where dependent variable is not entry mode for instance R&D intensity (Kumar, 1996) or imitation capacity(You, and Katayama, 2005). Third, we only included studies where IPR protection and/or IPR enforcement are measured with an isolated and not aggregated measurementas independent variable. For instance, studies that proxied IPR systems using measures of political stability, corruption perception index, political freedom, government effectiveness/efficiency etc. were excluded. Fourth, the empirical studies must include information on all the essential data (i.e. Effect sizes, Standard errors, Sample size) (Stanley and Doucouliagos, 2012). Fifth,we excluded studies in policy-oriented journals such as WIPO and WTO (with either only a small summary of the topic or that focused on policy issues and improvements) editorials and commentaries.
Data extraction for meta-analysis	Essential data: -Effect sizes -Standard errors -Sample size -Name of authors and paper	All essential data were collected
	Typical data:	All typical data were collected

	-Estimation technique (cross-sectional/panel data, and firm/industry level data) -Country under investigation -Time period under investigation -Model specification (OLS etc.)			
	Effect size: -Direct use of regression coefficients or -Zero order correlations or -Partial correlation or -Elasticities or -Semi-elasticities or -t-statistics	t-statistics were collected		
	Publication bias	Test for publication bias	Yes – see Methodology and Results section	
Reporting	Report findings using discussion and tables		Yes- see Results	
	Provide a detailed research directions section based on findings		Yes – See Discussion and Future research section	

Table 2. Empirical studies on entry modes included in the three meta-analyses

Study	Country	Data year	Capturing IPR protection	Capturing IPR enforcement	Results
FDI studies					
Puttitanum (2002)	Mixed (developed & developing)	1995	yes	no	+
Adams (2010)	Emerging	1985-2003	yes	no	+
Awokuse& Yin (2010)	Emerging	1992-2005	yes	no	+
Co et al (2004)	Mixed (developed & developing)	1982-1992	yes	no	+
Du et al (2008)	Emerging	1993-2001	yes	no	+
Fosfuri (2004)	Mixed (developed & developing)	1981-1996	yes	no	insignificant
Javorcik (2004)	Emerging	1989-1994	yes	yes	+
Khan &Samad (2010)	Emerging	1970-2005	yes	no	+
Kondo (1995)	Mixed (developed & developing)	1979-1987	yes	no	Insignificant

Nicholson (2007)	Mixed (developed & developing)	1995	yes	no	-
Watkins & Taylor (2010)	Emerging	2006-2008	yes	yes	Insignificant
Kashcheeva (2010)	Mixed (developed & developing)	1970-2009	yes	no	-
McCalman (2004)	Mixed (developed & developing)	1997	yes	no	+/-
Nunnenkamp&Spatz (2004)	Mixed (developed & developing)	1995	yes	yes	+
Pfister&Deffains (2005)	Emerging	1959-1994	yes	no	Insignificant
Ushijima (2013)	Mixed (developed & developing)	1985-2004	yes	no	+
Zuniga &Bascavusoglu (2005)	Mixed (developed & developing)	1992-2000	yes	no	+
Fink (2005)	Mixed (developed & developing)	1992	yes	no	Insignificant
Awokuse&Gu (2015)	Mixed (developed & developing)	1994-2006	yes	yes	+
Hsu &Tiao (2015)	Emerging	1985-2010	yes	no	+
Rai (2008)	Emerging	1990-2007	yes	no	+
Zhang & Yang (2016)	Emerging	1985-2012	yes	no	+
Park &Lippoldt (2008)	Mixed (developed &developing)	1990-2005	yes	yes	+

<div align="center">**Trade studies**</div>

Awokuse& Yin (2010)	Emerging	1991-2004	yes	no	+
Boring (2012)	Emerging	1995-2010	yes	no	+
Briggs (2012)	Emerging	1970-2000	yes	no	+
Doanh&Heo (2007)	Emerging	1990-2000	yes	no	+
Falvey et al. (2009)	Mixed (developed & developing)	1970-1999	yes	no	+/-
Fink & Braga (1999)	Mixed (developed & developing)	1989	yes	no	+
Liu & Lin (2005)	Emerging	1989-2000	yes	no	insignificant
Maskus& Yang (2013)	Mixed (developed & developing)	1985-2005	yes	yes	+
Fink (2005)	Mixed (developed & developing)	1992	yes	no	insignificant
Ngassam (2006)	Emerging	2003	yes	no	+
Plasmans& Tan (2005)	Mixed (developed &developing)	1991-2001	yes	no	+/-

Pradhan (2007)	Mixed (developed & developing)	1996-1999	yes	no	+
Puttitanum (2002)	Mixed (developed & developing)	1995	yes	no	-
Rafiquzzaman (2002)	Mixed (developed & developing)	1990	yes	no	+
Salim et al. (2014)	Mixed (developed & developing)	1995-2010	yes	no	+
Smith (1999)	Mixed (developed & developing)	1992	yes	no	+
Smith (2001)	Mixed (developed & developing)	1989	yes	no	-
Smith et al. (2009)	Mixed (developed & developing)	2005	yes	no	+
Weng et al. (2009)	Mixed (developed & developing)	1997-2005	yes	yes	+
Yang & Huang (2009)	Mixed (developed & developing)	1997-2003	yes	yes	+/-
Yew et al. (2011)	Emerging	1993-2006	yes	no	-
Park &Lippoldt (2008)	Mixed (developed & developing)	1990-2005	yes	yes	+
Al-Mawali (2011)	Mixed (developed & developing)	1990-2005	yes	no	insignificant

Licensing studies

Bransteller et al. (2006)	Mixed (developed & developing)	1982-1999	yes	no	+
Fosfuri (2004)	Mixed (developed & developing)	1981-1996	yes	no	Insignificant
Fink (2005)	Mixed (developed & developing)	1992	yes	no	Insignificant
McCalman (2004)	Mixed (developed & developing)	1997	yes	no	+/-
Papageorgiadis et al. (2013)	Mixed (developed & developing)	1998-2007	yes	yes	+
Park &Lippoldt (2004)	Mixed (developed & developing)	1992-1999	yes	no	+
Puttitanum (2002)	Mixed	1995	yes	no	+

	(developed & developing) Mixed (developed & developing)				
Smith (2001)		1989	yes	no	+
Wakasugi& Ito (2009)	Mixed (developed & developing)	1995-2001	yes	no	+
Yang &Maskus (2001)	Mixed (developed & developing)	1986-1995	yes	no	+
Nicholson (2007)	Mixed (developed & developing)	1995	yes	no	+

Table 3. Definitions of variables and sources of data

Variable	Definition	Data source
Dependent variable		
t-statistic(main model)	t-statistic for IPR protection/enforcement	Primary*
C_{sig}(robustness tests)	Categorical dependent variable: =0 if IPR protection/enforcement estimates are negative, =1 if they are insignificant, =2 if they are positive.	Primary
FDI dataset – Independent variables		
FDI flows	=1 if FDI is measured in terms of FDI flows, =0, otherwise	Primary
Capital invested	=1 if FDI is measured in terms of capital invested, =0, otherwise	Primary
FDI other	=1 if FDI is measured in terms of FDI stock, share in GDP, number of firms =0, otherwise	Primary
IPR protection	= 1 if Ginarte and Park (1997)/ Park (2008) patent protection index is used, = 0, otherwise =1 if Rapp and Rozek IPR index is used, =0, otherwise =1 if membership in Paris Convention is used, =0, otherwise =1 if number of patent application is used, =0, otherwise	Primary
IPR enforcement	=1 if the WEF index used, =0, otherwise =1 if authors used own patent enforcement indexis, =0, otherwise	Primary
OLI	=1 if study used the OLI framework, =0, otherwise	Primary
Transaction cost theory	=1 if study used the transaction cost theory, =0, otherwise	Primary
No theoretical support	=1 if study offers no theoretical support, =0, otherwise	Primary
Panel data	= 1 if panel data are used, = 0, otherwise	Primary
Firm level data	= 1 if firm level data are used, = 0, otherwise	Primary
No. of observations	The number of observations used in each study	Primary
Time span	The number of years of the data used	Primary
OLS	=1 if the OLS method is used, =0 otherwise	Primary
GMM	=1 if the GMM estimator is used, =0 otherwise	Primary
GLS	=1 if the GLS method is used, =0, otherwise	Primary
SUR	=1 if the SUR method is used, =0, otherwise	Primary
Year fixed	=1 if year fixed effects are included, =0 otherwise	Primary
Random fixed	=1 if random effects are included, =0 otherwise	Primary

Probit model	=1 if the probit model is used, =0, otherwise	Primary
Publication	=1 if a peer reviewed journal publication, =0 otherwise	Primary

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Trade dataset – Independent variables

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Trade flows	=1 if trade is measured in terms of trade flows, =0, otherwise	Primary
Real imports	=1 if trade is measured in terms of real imports, =0, otherwise	Primary
Real exports	=1 if trade is measured in terms of real exports, =0, otherwise	Primary
Trade other	=1 if trade is measured in terms of industry exports, number of firms, =0, otherwise	Primary
IPR protection	= 1 if Ginarte and Park (1997)/ Park (2008) patent protection index is used, = 0, otherwise =1 if Rapp and Rozek IPR index is used, =0, otherwise =1 if membership in Paris Convention is used, =0, otherwise =1 if number of patent application is used, =0, otherwise	Primary
IPR enforcement	=1 if the WEF index used, =0, otherwise =1 if authors own patent enforcement indexis used, =0, otherwise	Primary
Market power/expansion	=1 if study used the market power/expansion concept, =0, otherwise	Primary
Transaction cost theory	=1 if study used the transaction cost theory, =0, otherwise	Primary
No theoretical support	=1 if study offers no theoretical support, =0, otherwise	Primary
Panel data	= 1 if panel data are used, = 0, otherwise	Primary
Firm level data	= 1 if firm level data are used, = 0, otherwise	Primary
No. of observations	The number of observations used in each study	Primary
Time span	The number of years of the data used	Primary
OLS	=1 if the OLS method is used, =0 otherwise	Primary
GMM	=1 if the GMM estimator is used, =0 otherwise	Primary
GLS	=1 if the GLS method is used, =0, otherwise	Primary
SUR	=1 if the SUR method is used, =0, otherwise	Primary
Year fixed	=1 if year fixed effects are included, =0 otherwise	Primary
Random fixed	=1 if random effects are included, =0 otherwise	Primary
Probit model	=1 if the probit model is used, =0 otherwise	Primary
Hausman–Taylor	=1 if the Hausman-Taylor technique is used, =0, otherwise	Primary
Publication	=1 if a peer reviewed journal publication, =0 otherwise	Primary

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Licensing Dataset – Independent variables

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Affiliate royalty payment	=1 if licensing/franchising is measured in terms of affiliate royalty payment, =0, otherwise	Primary
Non-affiliate royalty payment	=1 if licensing/franchising is measured in terms of non-affiliate royalty payment, =0, otherwise	Primary
Licensing/Franchising other	=1 if licensing/franchising is measured in terms of number of firms, =0, otherwise	Primary
IPR protection	= 1 if Ginarte and Park (1997)/ Park (2008) patent protection index is used, = 0, otherwise =1 if Rapp and Rozek IPR index is used, =0, otherwise =1 if membership in Paris Convention is used, =0, otherwise =1 if number of patent application is used, =0, otherwise	Primary
IPR enforcement	=1 if the WEF index used, =0, otherwise =1 if authors used own patent enforcement indexis, =0, otherwise	Primary
OLI	=1 if study used the OLI framework, =0, otherwise	Primary
Transaction cost theory	=1 if study used the transaction cost theory to deduct its hypotheses/ develop theoretical background, =0, otherwise	Primary

	=1 if study offers no theoretical support, =0, otherwise	
No theoretical support	=1 if study offers no theoretical support, =0, otherwise	Primary
Panel data	= 1 if panel data are used, = 0, otherwise	Primary
Firm level data	= 1 if firm level data are used, = 0, otherwise	Primary
No. of observations	The number of observations used in each study	Primary
Time span	The number of years of the data used	Primary
OLS	=1 if the OLS method is used, =0 otherwise	Primary
GMM	=1 if the GMM estimator is used, =0 otherwise	Primary
GLS	=1 if the GLS method is used, =0, otherwise	Primary
SUR	=1 if the SUR method is used, =0, otherwise	Primary
Year fixed	=1 if year fixed effects are included, =0 otherwise	Primary
Random fixed	=1 if random effects are included, =0 otherwise	Primary
Probit model	=1 if the probit model is used, =0, otherwise	Primary
Publication	=1 if a peer reviewed journal publication, =0 otherwise	Primary

Table 4. FDI Meta-analysis results Baseline model and Robustness check model

	Model 1 - Baseline t-statistics	**Model 2 - Robustness Ordered probit model (pooled)**	**Model 3 – Robustness Ordered probit model (random effects)**
FDI flows	-0.300	-0.923	-0.616
	(-0.31)	(-1.19)	(-0.49)
Capital invested	1.448	1.252	1.820
	(1.15)	(1.33)	(1.06)
GP index	-2.031*	-1.841**	-2.373*
	(-2.52)	(-3.25)	(-2.57)
WEF	-3.345***	-2.324***	-2.848**
	(-3.85)	(-4.26)	(-3.14)
Authors' own index	-2.533**	-2.201***	-2.730**
	(-2.86)	(-3.50)	(-2.96)
OLI	7.840***	8.574***	11.41***
	(4.43)	(11.45)	(9.72)
No theoretical support	9.336***	9.189***	11.80***
	(5.37)	(14.34)	(4.97)
Panel data	-1.528	0.717	-0.324
	(-1.27)	(0.83)	(-0.18)
Firm level data	-0.963	-1.166	-1.050
	(-1.20)	(-1.70)	(-1.71)
Time span	-0.0594	-0.0204	0.0187
	(-1.67)	(-0.69)	(0.38)
Number of Observations	0.000296	0.000161	0.0002**
	(1.70)	(1.47)	(2.66)
OLS	-0.631	0.219	0.644
	(-0.90)	(0.31)	(0.74)
GMM	1.777	1.410	2.006*
	(1.73)	(1.79)	(2.11)
GLS	0.689	0.492	1.178
	(0.60)	(0.47)	(0.72)
Ordered probit model	-1.300	-0.471	-0.888
	(-1.20)	(-0.60)	(-1.20)
SUR	-0.584	0.884*	0.998

	(-0.55)	(2.17)	(1.73)
Publication	-0.903	0.349	0.502
	(-1.45)	(0.54)	(0.54)
Before TRIPs	3.761*	1.220	0.659
	(3.20)	(1.66)	(0.93)
During & after TRIPs	3.006***	0.930*	0.760
	(3.67)	(2.56)	(1.41)
Emerging economies	2.243**	-0.00288	-0.283
	(2.73)	(2.17)	(-0.64)
N	255	276	276

t statistics in parentheses
*$p< 0.05$, **$p< 0.01$, ***$p< 0.001$

Omitted variables: FDI other, Number of patent applications, Paris convention, TCT, Year fixed effects, Random effects, Mixed economies